Information and Communication Technology

Classes Nine and Ten



National Curriculum and Textbook Board, Bangladesh

Prescribed by the National Curriculum and Textbook Board
as a textbook for classes nine and ten from the academic year 2015

Information and Communication Technology

Classes Nine and Ten

Revised for the year 2026

NATIONAL CURRICULUM AND TEXTBOOK BOARD, BANGLADESH

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Preface

The importance of formal education is diversified. The prime goal of modern education is not to impart knowledge only but to build a prosperous nation by developing skilled human resources. At the same time, education is the best means of developing a society free from superstitions and adheres to science and facts. To stand as a developed nation in the science and technology-driven world of the 21st century, we need to ensure quality education. A well-planned education is essential for enabling our new generation to face the challenges of the age and to motivate them with the strength of patriotism, values, and ethics. In this context, the government is determined to ensure education as per the demand of the age.

Education is the backbone of a nation and a curriculum provides the essence of formal education. Again, the most important tool for implementing a curriculum is the textbook. The National Curriculum 2012 has been adopted to achieve the goals of the National Education Policy 2010. In light of this, the National Curriculum and Textbook Board (NCTB) has been persistently working on developing, printing, and distributing quality textbooks. This organization also reviews and revises the curriculum, textbook, and assessment methods according to needs and realities.

Secondary education is a vital stage in our education system. This textbook is catered to the age, aptitude, and endless inquisitiveness of the students at this level, as well as to achieve the aims and objectives of the curriculum. It is believed that the book written and meticulously edited by experienced and skilled teachers and experts will be conducive to a joyful experience for the students. It is hoped that the book will play a significant role in promoting creative and aesthetic spirits among students along with subject knowledge and skills.

The education policy has made Information and Communication Technology compulsory in all streams of the education from grade VI and XII to introduce the concepts as in acquiring literacy in this subject well as to make the students proficient in **information and communication technology.** The curriculum and textbooks of this subject have been developed in accordance with this. Hopefully, the textbook of Information and Communication Technology for class IX and X will play a significant role to make students interested in this subject along with acquiring literacy in Information and Communication Technology and creating scope for new jobs.

It may be mentioned here that due to the changing situation in 2024 and as per the needs the textbook has been reviewed and revised for the academic year 2026. It is mentionable here that the last version of the textbook developed according to the curriculum 2012 has been taken as the basis. Meticulous attention has been paid to the textbook to make it more learner-friendly and error-free. However, any suggestions for further improvement of this book will be appreciated.

Finally, I would like to thank all of those who have contributed to the book as writers, editors, reviewers, illustrators and graphic designers.

October, 2025

Professor Robiul Kabir Chowdhury
Chairman (Additional Charge)
National Curriculum & Textbook Board, Bangladesh

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First Chapter

Information and Communication Technology and Our Bangladesh



After completing this chapter, we will be able to –

- explain the significance of ICT;
- explain the contributions of the people related with ICT;
- explain the importance of e-learning in Bangladesh;
- explain the necessity of e-governance in Bangladesh;
- explain the importance of e-service in Bangladesh;
- explain the importance of e-commerce in Bangladesh;
- analyse the prospect of ICT in job-sectors in Bangladesh;
- explain the role of ICT in social networking;
- explain the positive aspects of ICT in entertainment;
- explain the future image of an ICT oriented Bangladesh;
- design a poster on an ICT oriented Bangladesh.

The 21st Century and Information and Communication Technology

The concept of wealth that prevailed in the last century has radically changed. The whole world rightly acknowledges that the wealth of the 21st century is knowledge. It means that neither agriculture, mineral resources and energy, nor industry and business are the sources of wealth. Human beings are the real asset because they are capable of searchıng knowledge. Thıs concept has reshaped the people's way of thinking throughout the world. They have been taking preparations to face the challenges of the 21st century.

We have already started realising that the world of the 21st century is making its firm standing on a knowledge-based economy. In this century, two more important factors - globalisation and internationalisation have come into being, and ICT is the main driving force behind their acceleration. Now the geographical border of a country transcends and extends to all parts of the world as an effect of globalisation. We can refer to Bangladesh as an example to make the point clear. Millions of Bangladeshis now live all over the world. The place where they live in is as if a small Bangladesh. So, in one sense, the border of Bangladesh has extended beyond its own one. Moreover, they, in spite of being the natives of Bangladesh, are living as the citizens of different countries. 'Internationalism' is the unwritten law of the present world.

Once people had to depend on the blessings of nature for survival. However, by inventing machines and tools, they have lessened this dependence. With the help of machines and technology, they have controlled the world economy after the Industrial Revolution in the 18th and 19th century. The nations, which participated in the industrial revolution, once ruled the world. A similar shift of power has been observed, as the knowledge-based economy has started dominating the world in the 21st century.

We can realise that we should take adequate preparation for taking part in this revolution. The specific skills for survival are the ability to cooperate and communicate with each other, awareness about the obligations of the citizenry, acumen in solving problems, critical thinking, creativity, and skill in ICT.

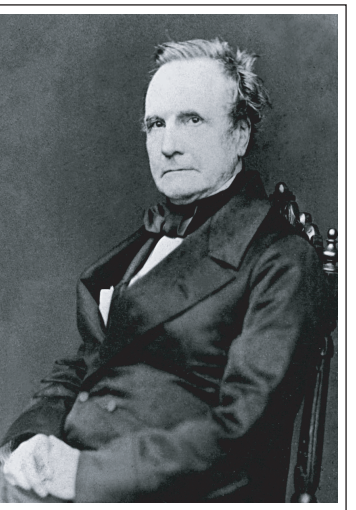


ICT Competition

In fact, skill in ICT has emerged as the most important technological skill. At present, many important tasks can be done easily and quickly using Artificial Intelligence (AI). Everyone should have the basic computer literacy to survive in the 21st century. Only then, one may have access to its amazing world. Unless students acquire the ICT skills, they may not generate new knowledge by collecting, and evaluating information. In fact, without the skill, they can never face the analysing, challenges in the 21st century and position themselves in the knowledge based society.

Great ICT Personalities

Many scientists, visionaries and engineers have contributed significantly to the development of Information and Communication Technology. Cable connection and the wireless system, acceleration of computers' computing power and the development of microelectronics have ensured rapid growth of ICT.


Charles Babbage

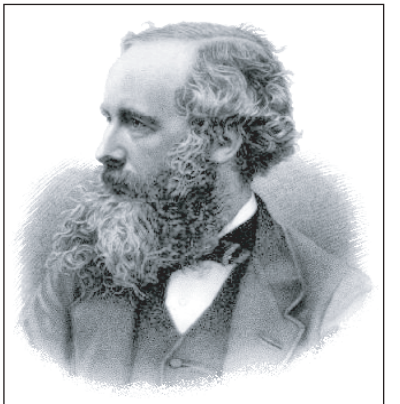
Charles Babbage (1791-1871), an English engineer and mathematician, first introduced and developed computer. He is regarded as the father of the modern computer. He invented Difference Engine In 1991. In the Science Museum of London, an engine was made according to the design of Babbage, and it worked properly as expected and later, he designed a calculating machine called Analytical Engine.


Ada Lovelace

Ada Lovelace (1815-1852), the daughter of poet Lord Byron, first thought about how the process of calculation could be made more effective. She became interested in science and mathematics since her childhood encouraged by her mother. When she met Charles Babbage in 1833, she brought before him the concept of 'programming' to use in his analytical engine. That is why Ada Lovelace is honoured as the pioneer of programming concept. Babbage delivered a lecture about his engine in 1840 at Turin University. Then Ada with the help of Babbage, explained the ways how the engine could work. She marked it in a numerical

order, while describing its mode of working. In 1953, when the note was published again one hundred years after the death of Ada, the scientist realised that it was Ada who put forward the idea about the Algorithm of programming.

Scientist James Clerk Maxwell (1831-1879), combining the electric energy and magnetic force, put forth the theory of Electromagnetic Force which opened a possibility of sending wireless messages from one place to another.


James Clerk Maxwell


Jagadish Chandra Bose

Bengali scientist Jagadish Chandra Bose (1858 - 1937) became successful for the first time in sending wireless messages from one place to another. In 1895, he successfully did it by using microwave. But his work was not recognized because it was not published


Guglielmo Marconi

But, Italian scientist Guglielmo Marconi (1874 -1937) succeeded first in doing the same work by radiowave. However, in 1997, the Institute of Electrical and Electronic Engineering (IEE) recognized him as a pioneer and one of the inventors of radio science. That is why he is acknowledged as the inventor of radio. In the 20th century, after the development of electronics, IBM Company was the first to build the mainframe computer In 1971, with the invention of the microprocessor, it became easier to make affordable computers. In the 60s and 70s, using the Internet Protocol, Arpanet was


Raymond Samuel Tomlinson

invented. The inter connection among the computers through network started developing since then, and the invention of the internet was the outcome. In 1971, American programmer Raymond Samuel Tomlinson introduced the first electronic mail communication through ARPANET. He is the pioneer of inventing the e-mail system. After the invention of the microprocessor, personal computer was made by using this device in the USA. Steve Jobs (1955-2011) and his two friends Steve Wozniak and Ronald Wayne started a company named Apple Computer on April 1, 1976. This company is one of the biggest organisations in the world. With Apple leading the way, various stages of personal computer development took place, opening a new horizon for the use of computers in daily life.



Steve Jobs

Later, IBM's quantum computer paved the way for future supercomputing. At the same time, advancements in nanotechnology have made computers smaller in size, bringing revolutionary changes in human life. Quantum computing is a new method built on the principles of quantum mechanics in physics. This type of computer is completely different from a traditional computer. While traditional computers use bits that hold a value of either 0 or 1, quantum computers use quantum bits, or qubits, which can hold both 0 and 1 simultaneously. Quantum computers can perform complex mathematical tasks at extremely high speeds. This is not only a breakthrough in computer science but also has the potential to bring revolutionary changes in the fields such as medical science, agriculture, secure communication, research, and many other areas of life.



Bill Gates

IBM company put the responsibility of developing the operating system for personal computers on 'Microsoft' of William Henry Gates or Bill Gates (Born on October 28, 1955) and is friends. They succesfully developed MS DOS and Windows operating system. At present, most of the computers of the world are run by the operating system software of Microsoft company of Bill Gates.

In 1989, during the development of the internet, a British computer scientist named Timothy John Berners Lee proposed and later on successfully invented information management by using Hypertext Transfer Protocol (http). He is known as the pioneer of the World Wide Web (WWW). For its development the Internet technology spread out throughout the world. A strong economic field has been created based on the Internet and different types of application software have been developed.


Timothy John Berners Lee


Mark Zuckerberg

The most popular social networking system in the world is Facebook. A student of Harvard University, Mark Zuckerberg (Born on May 14, 1984) and his four friends are the pioneers of creating the social networking system Facebook. At first, it was used only by the university students. But now many people of the world are using Facebook. Everyday the number of its viewers is increasing. Many people in our Bangladesh use Facebook for social networking too.

E-learning and Bangladesh

For years, knowledge has been acquired across the world in traditional methods. The innovation and development of ICT have brought about changes for the first time in these methods. We have become familiar with the terms like e-learning and Distance Learning. E-learning is the short version of electronic learning which basically means a teaching process by using CD-ROM, the Internet, personal network and TV channels. However, we should keep in mind that e-learning is not an alternative to the conventional way of learning. For example, it is hard to demonstrate in class different scientific and natural phenomena, such as, a solar eclipse, a lunar eclipse, and so on. A teacher may demonstrate these phenomena with images, videos, and graphs with the help of multi-media. The class can be interactive too.

Bangladesh has a huge population, and that is why the class size is usually big. The schools in our country lack skilled teachers, teaching and learning materials, science laboratories, etc. The students do not have a wide scope of doing scientific experiments. E-learning can play a vital role to solve these problems. A lesson conducted by a skilled teacher may be recorded and distributed to

hundreds of schools. Different learning materials for teaching a specific subject can be given to students. Teachers themselves may make their lessons more effective and these lessons may be reused in other classes. Many terchers of Bangladesh are using e-learning materials.

Teaching and learning materials are made for e-learning all over the world. Renowned universities of the world have introduced online courses and anybody can take any of these courses. A learner, after taking the course, either by submitting his homework or sitting for examination online, can get the requisite credit.

Bangladesh is not lagging behind in e-learning. The ICT specialists of the country have opened some web portals offering courses in Bangla, and learners from any part of the world can take the courses. The ICT oriented training courses in computer programming have earned popularity at home and abroad.

E-learning can play a vital role in over-coming the limitations of teaching in Bangladesh. However, it is not a substitute of the conventional teaching method of a classroom in which teachers and students have face-to-face interactions, exchange of opinions, and question and answer sessions. Moreover, students can ask questions, interact, and help themselves in learning something. In addition, teachers and students can assist each other in the learning process and optimise their learning by peer-bonding. By contrast, possibilities of interactions are minimal in e-learning. As e-learning requires little human participation, it may become mechanical. Therefore, in order to make e-learning successful, students need to be very pro-active. E-learning has a wide scope in Bangladesh as we can minimise the limitations in classroom teaching by adopting e-learning. However, implementation of e-learning practices in classroom will require fast internet connectivity, necessary infra-structure, and e-learning materials. The present Government is developing this type of teaching learning materials. It will help our students to achieve Global standard.

Group Activity
Discuss in group and present how e-learning can play a vital role in the development of education.

E-Governance and Bangladesh

Transparency and accountability are needed for a good governance. A modern, transparent, and accountable governance can be ensured by introducing a digital

system. It will ensure good governance, stop the harassment of the citizen, and pave the way of good governance. The application of electronic or digital method in the government administration is called e-governance.

Once, it was very difficult for the examinees and their guardians to collect the results of a public examination. It was even more difficult for the people living in the remote villages. Even two decades ago they could not collect their results a week after the publication of the result. Now they can get it either through the internet or the SMS option of the mobile phone. So, the trouble of instantly collecting the result has come to an end.

Another example of e-governance is the facility of submitting applications to the higher educational institutions with the help of the mobile phone. Previously if a candidate of Jessore wanted to apply to Shahjalal University of Science and Technology, he had to complete a series of formalities. Candidates or their representatives had to travel to Sylhet in order to collect and submit university admission application forms. Now candidates may submit their applications through mobile phones. They need not to travel from one city to another.

District offices of the Deputy Commissioners have E-service Centres in order to ensure easy, affordable, and hassle-free services. Now a delivery of a service that took 2-3 weeks in the past now takes only 2-5 days. On top of it, digitalisation of the information has reduced the time in decision making. Government departments have become transparent and accountable in providing their services and increased their efficiency in issuing copies of deeds and settlement records.

The manual process of paying gas, electricity and water bills is time-consuming and troublesome. Sometimes the busy hours of a day are spent to pay the utility bills. Now the bills can be paid either online or through cell phones. The target of the Government is to ensure better life standards and a hassle-free life for its citizens. E-governance has made some services accessible 24 hours a day, seven days a week, 365 days a year. Some of these services, for example, are ATM services, mobile banking, information services, etc. As a result, citizens may avail the service at their convenience.

In addition, with the introduction of e-services and inter-departmental communication, networking within the Government has increased. Government employees have also become skilled. As a result, providing faster service has become easier.

Bangladesh has introduced e-governance a few years ago. E-service is yet to be introduced to all sectors of the government. With its successful implementation in every sector, Bangladesh will certainly ensure good governance.

E-Service and Bangladesh


BANGLADESH RAILWAY

Dear X,

This Ticket will be valid on production of Photo Identity Card of the Passenger.

Many government and non-government service providing organisations provide the citizens with temporary and full time services. This might be travelling from one place to another or issuing duplicate records of a land. Before the introduction of the digital system, the services seekers had to meet the service provider, but now they can receive the services through the internet or mobile phones while staying at home. For example, they can purchase tickets through the internet. or mobile phone. People, a few days ago, had to go physically to Kamlapur train station, and stand in the queue in front of the counters for tickets.This system is still in practice, but now anyone can collect tickets and pay the fares online. Providing services through an electronic system is called e-service. E-service ensures availability of services at low cost in the shortest possible time without much hassle. E-service has already been introduced to several ministries, departments and directorates of the Government of Bangladesh.

The digital edition of textbooks, e-settlement records, e-permit, e-ticket, telemedicine, e-tin registration and income tax calculation, etc. are the examples of e-services.

A. E-permit: It is one of the primary e-services of the country. The sugar cane farmers of fifteen sugar-mills of the country get e-permit through the message option of the cell phone. An e-permit is the official permission of the sugar mills authority for the farmers to supply sugar canes at a fixed time. The harassment of the farmers has come to an end as they receive the information of supplying sugar canes through SMS. The production of the sugar mills has also been increased due to timely supply of sugar canes.

B. Electronic Money Transfer System (MTS): Money can be sent at a low cost from one place to another quickly and safely through the electronic money transfer system of the Bangladesh Postal Department. It is possible to transfer BDT 50000 in one minute. This service is available in all post-offices in Bangladesh.

C. E-settlement Records : The duplicate of land settlement records can be collected through this service. Previously employees of the land settlement department would supply the information to the applicants from big record books after the applicants had filed up the prescribed forms. The applicants had to be present physically in the office and the employees of the concerned department would prepare it manually. Because of the e-service, applicants at home and abroad can receive the settlement records, paying the required fees.

D. E-healthcare: Physicians in government health centres give advice on mobile phones. That is why government hospitals have been provided with mobile phones. Any citizen of the country can get the advice of any physician. Besides, in some hospitals, telemedicine service has been introduced. Because of the telemedical services, a patient in upazila may avail the service and advice of medical specialists in district hospitals on mobile phones.

E. E-tiketing and Mobile Ticketing of Railway: Tickets of some intercity trains can be collected either through mobile phone or online. As a result, travellers can purchase the ticket at their convenience without going to the ticket counters of the railway station. They can reach the station just before the departure of the train and collect the printed ticket from a particular counter.

E-commerce and Bangladesh

There is no substitute for trade and business for the progress and creation of jobs in a country. A change has been brought about in the business sector of Bangladesh through the innovation of digital technology and the internet and exchanging process besides paper currency. Running a business through an electronic medium is known as e-commerce.

There are some terms and conditions in business. Firstly, the sellers must have the commodity. Secondly, the buyers will pay the price of the product. This transaction requires direct communication between the seller and buyer. However, in the era of internet, sellers may create a website and display the

images of their products. The buyers, after choosing the commodity, pay the price and get it. The buyers have the facilities to pay the price through debit and credit cards. They can pay through mobile banking even. Thirdly, on receipt of the payment, the sellers either deliver the products themselves or by courier. Another payment method is through courier service after receiving the price.

The bill payment can also be done in the Cash on Delivery (COD) method, which is different from mobile banking and debit or credit card payment. The purchaser choose the product from the website of the seller and orders for supply. The seller after getting the order sends it to the buyer who pays the bill after receiving it.

E-commerce has been gradually increasing in Bangladesh since 2011-12. Now everything including books, garments, food, luxurious goods, etc. is sold or bought through e-commerce. Two types of establishments are noticed in e-commerce like a conventional business. One kind of establishment sells only its own products and another kind sells the products of different companies. You have already seen such advertisements on websites, social media, television, or in newspapers and magazines. .

ICT in the Job Sector of Bangladesh

Nowadays, the multifarious use and impact of ICT in the job sector is noticed in Bangladesh like other countries of the world.The impact and capacity of ICT are gradually increasing. Two types of impact of ICT are noticed. First, the introduction of ICT in the prevailing working sectors has enhanced the skills of the employees and extended the market. Second , ICT itself has created new job-opportunities.

The use of ICT in the prevailing existing job sector and old business sectors, on the one hand, has enhanced the efficiency, transparency and accountability of the professional groups; on the other hand, it has increased the standard of service. Skill in ICT is now regarded as the elementary qualification for any job. Employees of banks, insurance, multinational companies, and government sectors need to be skilled in word processing, presentation software, internet browsing, email management, analytical software, etc. In addition, they have to develop expertise in a specific software product, such as banking software. On top of it, ICT has created a large job market of making hardware, software, developing websites, maintenance, etc. Now it is a big market for the skilled workers who can work at home or abroad and set up their own ICT firms.

A major part of the tasks can be accomplished at home. Many people earn foreign currency for the country through outsourcing.

Social Networking and ICT

Social mobility and development require communication amongst individual human beings. So, social communication means interaction among people through virtual communication and networking. In other words, what people create and exchange to communicate and express by using the internet and ICT is called social networking. Now this communication has become easier, cost-effective and usually safe. By using the internet, e-mail, mobile phone and messaging system, blogging and platforms of social networking, the ICT based social networking has been made easy. Platforms have been set up on the internet, known as social networks. Such as Facebook, Twitter, LinkedIn, Instagram etc. Two most popular social networking websites are Facebook and Twitter.

- **www.facebook.com:** Facebook is a website of the social networking system. Mark Zuckerberg along with some of his friends launched this site. Anyone can be a member of Facebook without any subscription. The users can add friends, send messages, update their personal information and give status and share information with others. Besides, audios and videos can be sent through it. Any organisation can open its home page on Facebook, and at the same time, like-minded people can form a Facebook group. According to

- **www.twitter.com** or X **:** Twitter is a social network too, but it has a basic difference with Facebook. The users have to express themselves and exchange opinions within 280 characters. That is why it can be called a website of micro blogging. The message of 280 words is called the 'Tweet'. The tweets of Twitters are displayed on their profile page. The members of the twitter can follow other members to read the tweets. Those who follow a member are called followers.

- **www.instagram.com:** Instagram is a popular social media platform launched in 2010 with a focus on photo and video sharing. It allows users to create stories and search for content via hashtags. It also includes Reels and shopping opportunities, through which brands and influencers can effectively engage with their followers or visitors. It is considered as one of the leading platforms for digital marketing."

- **LinkedIn (www.linkedin.com):** It is the largest professional social media platform in the world. It was launched in 2003. It is primarily used for job searching, building professional connections, and forming business networks. Users can share their skills and experiences here. Professionals can connect with each other to learn about job and business opportunities.

Entertainment and ICT

With the development of ICT, a new era in the entertainment world has started. It has occurred in two ways. First, how people consume entertainment has fundamentally changed. Second, different media of entertainment have qualitatively changed.

Let us first see how individual media consumption habit has transformed in response to the changes in ICT. Once, people had to go outside for entertainment. If they wanted to enjoy a film, they had to go to the cinema hall to enjoy a film; to the playground to watch a football match; to a concert to listen to music. Nowadays, there is no need to go outside for entertainment. Radio was invented first, and then the television. The computer came eventually. The Internet is the latest addition to the computer. We have discovered that people can enjoy all kinds of entertainment within the four walls of their home. When computer first came into being, it was only used for computation and calculation. Only the big organisations and the government could afford computers. However, with the development of technology, computers have become easily available and people have started using them for their personal purposes. Since computers have become more sophisticated with processors, huge storage, and considerable memory, they can be used not only for writing or calculation, but also for entertainment. Perhaps, people use computers mostly for their entertainment. Composing a song, making a movie, and editing a photograph - all can be done on computers. Because of the development of ICT, changes have come to the media and forms of entertainment. Since songs can be digitised and converted into MP3 format, they can be played on computers. Similarly, we can watch videos and movies on computers. A huge volume of data can be stored on CD or DVD. Watching movies on DVD players without going to the cinema hall is a very common practice nowadays. Internet with faster speed has become easily available due to 'fibre optic network'. As a result, people do not have to depend on audio CD or DVD either for listening to music or watching films. On top of it, programmes in different radio and television channels can be directly accessed through the Internet. Sometimes recorded programmes are also available on the Internet. Hence, viewers can access these programmes according to their convenience.

New forms of entertainment have appeared with the development of ICT. Computer games are one of them. Big industries of computer games have been established all over the world and the experts of these industries are innovating computer games of various sorts. The extensive popularity of computer games

demonstrates its immense success as a new medium of entertainment. One of the reasons for their success is that computer games entertain people of all ages with different preferences. These games can be played with others, the computer itself, or even with gamers in a remote place via network. In fact, it should be noted here that excessive and compulsive use of computer or video games may become so strong that it can easily turn into an addiction. That is why people around the world are warned about the negative consequences of compulsive computer or video gaming. Development in ICT played a vital role in the emergence of new forms of entertainment. Once, making animation or cartoon films was very difficult. It has become easier for ICT and high-end/ super computers. Not only that, innovations done by creative designers have brought about changes to graphic works. Digital actors and actresses have been created on computers for graphic movies that are no longer dependent on real actors and actresses. Use of high-end/ super computers in creating imaginary dinosaurs and aliens for popular commercially successful films is very common nowadays.

In summary, ICT has not only created new forms of entertainment, but also made them accessible to the mass. Most importantly, ICT has revolutionised the entertainment industry and its ultimate future in the entertainment industry is beyond one's imagination.

Bangladesh has started developing information and communication technology late in comparison with other countries. That is why Bangladesh is significantly lagging behind. Even though the significance of ICT was not realised, nowadays ICT is getting proper importance. We are getting high speed internet connection as we are connected to the submarine cable.

There is a positive side of the extension of technology. If a nation lags behind at a moment in any particular technology, it does not mean it will stumble all the time. It may leapfrog other countries. Bangladesh is trying her level best to be equal with other countries in her use of technology.

In the 2024 edition of the ICT Development Index (IDI) formulated by the International Telecommunication Union (ITU), Bangladesh scored 62 out of 100. This score is lower than the average for lower-middle-income countries (64.8) and significantly below the average for countries in the Asia-Pacific region (77.3). In this index, Myanmar, Sri Lanka, Maldives, Vietnam, and Bhutan ranked higher than Bangladesh.

Through e-Governance, transparency in all government activities can be ensured. The E-Government Development Index (EGDI) is used to present the state of e-governence development among the UN member states. Factors such as internet access infrastructure, online services, telecommunications connectivity, and people's capacity to use ICT are considered. In the 2024 index, Bangladesh ranked 100th out of 193 countries. In this regard, Bangladesh still has a long way to go in improving its use of ICT.

The infrastructure for information technology has started to be constructed in the country by the present government setting up fibre optic connection throughout the country. An initiative is taken to provide the internet service to remote area by the number of telephone users was negligible in the country just one and a half decades ago, but now every adult uses a phone. Information service centres have been opened at the union level; the post offices of the remote areas are transformed into e-centres that provide the service of mobile money transaction. The district information cell and the national information cell with the union information centres are important additions to the infrastructure of the country. The tasks like registration of admission test, getting the result of public examination, and purchasing train tickets are being done regularly on the mobile phone. ICT courses are included in the curriculum of schools and colleges. This textbook is an example of that. Computer Science is being taught in the colleges and universities. The younger generation of the country is joining the software companies along with setting their own firms, and a large number of young people are strengthening the economy of the country through outsourcing.

12th May, 2018 is a very important day for us. In this day, Bangladesh, as 57th state of the world, has launched its own 'Bangladesh satellite - 1' in the space. As a result we have moved one step ahead to digital Bangladesh. Bangladesh will be benefited in the field of education, health, agriculture, weather forecast and economic advancement by using this satellite. This will be used in satellite based television services as well as ensuring our national security. For this satellite it will be easy to spread internet and telecommunication facilities in the remote areas of the country. By using Bangladesh satellite - 1, we will be able to save and earn foreign currency in the Information and telecommunication sector.

Activity

Design a poster about what to do for building up 'Digital Bangladesh'.

Exercise

1. In which year did the London Science Museum create a mechanically calculating engine?

a. 1833
b. 1842
c. 1953
d. 1991

2. Whose invention has enabled people today to work from home?

a. Charles Babbage
b. Ada Lovelace
c. James Clerk Maxwell
d. Jagadish Chandra Bose

3. Who is one of the key innovators of Facebook?

a. Steve Jobs
b. Bill Gates
c. Mark Zuckerberg
d. Tim Berners-Lee

4. The use of information and communication technology in government work results in:

i. Access to government services in a shorter time
ii. Improvement in the quality of government services
iii. Availability of certain government services even on holidays

Which of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

Read the following passage and answer questions 5 and 6:

Sumon Ahmed fell ill while traveling to Saint Martin. He contacted a doctor in Dhaka via phone, who advised him to go to a hospital immediately. The local hospital doctor then consulted with a specialist in Dhaka to determine the best course of treatment for Sumon.

5. Through which method can a local doctor receive expert consultation?
i. Telemedicine services
ii. E-health services
iii. E-commerce services

Which of the following is correct?
a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

6. Which technology played a primary role in Sumon Ahmed's treatment?
a. ICT
b. Television
c. Robotics
d. Computer

Short Answer Questions

1. Why are common people considered the world's greatest resource in the 21st century?

2. What skills are necessary for a knowledge-based society?

3. Why does a student need knowledge of information and communication technology (ICT)?

4. What is e-learning? Mention one advantage of e-learning.

5. What is e-governance? Mention one advantage of e-governance.

6. Introduce two e-services available in Bangladesh.

7. What is e-commerce? Mention one advantage of e-commerce.

Second Chapter

Computer Maintenance and Cyber Security



After completing this chapter, we will be able to –

- explain the importance of computer maintenance;
- differentiate between software uninstallation and software deletion;
- explainthe cyber risks and information security;
- explain the impact of cyber crime on people's lives and what to do if a victim of a cyber attack;
- explain the difference between general and social sites;
- analyse the consequence of the excessive use of the internet;
- explain the negative aspects of playing games excessively;
- describe the event of software piracy;
- explain the importance of copyright law;
- explain the necessity of security with reference to the free flow of information in the internet;
- expain the importance of troubleshooting in computers;
- install and uninstall software following the right process;
- prepare a unique password;
- troubleshoot the usual problems of the computer.

Computer Maintenance

A computer combines various electronic components (hardware) and software. Therefore, to ensure optimal performance, it must be properly maintained. The computer must be protected from external factors such as humidity, temperature, electrical fields, magnetic fields, dust, smoke, water, etc. Additionally, the operating system and application software must be kept up to date. Thus, computer maintenance refers to the efforts to keep the computer in good working condition.

There are two types of computer maintenance:

1. Preventive Maintenance: Preventive maintenance refers to taking precautionary measures before a fault or issue arises in the computer. Users can perform this type of maintenance, such as virus scanning, disk cleaning, disk defragmentation, software updates, etc.
2.Corrective Maintenance: Corrective maintenance refers to repairing or replacing components after a fault or issue has occurred in the computer to make it operational again. Corrective maintenance usually requires the help of a computer technician.
One more important thing to note is that no metallic objects or magnets should be kept near the computer. Additionally, to protect against electric shocks, the computer's power connection should have proper grounding.

Importance of Software in the Maitenance of Computer

Story 1: Raina was very intent on having a laptop from her father after getting admission to the college. As her attainment in the first term examination was good, her father bought her a branded laptop with core i5 processor. Raina was impressed with the quality and speed of the laptop. She installed many pieces of software within a few days. However, she noticed a gradual decline in its performance. After one year, she observed that the laptop was running too slow and it was irksome working on the computer. After some days, she made a capricious demand to her father for purchasing another one for her.

Story 2: Ankon has recently taken internet connection for the computer. Now he frequently browses the Web and has benefitted greatly from the sites with the information related to his study. Besides education, he uses the internet for

sending emails, listening to music, and watching movie. Recently he has found the computer often restarting without any prior notification. In addition, the internet browser opens different sites without any command. One day, he inserted a memory stick into the USB connection port on his computer. He was shocked to find out that his files turned into 'shortcuts'. He could not even locate the original files.

What do you understand from the above events? Is it similar to your experience? You have already known many things about Information and Communication Technology, and you have understood that the processor and software are the main components in ICT. A new computer, be it a desktop, laptop or tablet, usually runs fast, but after some days, it gradually slows down. As it gets old, it becomes slow. Sometimes, you have to wait for a long time after giving a command. Sometimes the situation is so bad that you want to buy a new one.

What is the way to resolve this situation? Here lies the importance of computer maintenance. You have to learn a little about computer maintenance in the junior classes. Most of the people do not like the task of maintaining ICT or technological devices. However, it is an important task. If you want to keep your ICT device operative, you have to maintain it. You need not to be an expert for that job. We are talking about software-oriented maintenance of ICT devices.

If the Windows Operating System of Microsoft Company is used in your ICT device (in almost all the computers of the world, Windows Operating System is used), you have to check its status and update the operating system all the time. If the device is connected to the internet, the updates are done automatically. Other operating systems provide similar kind of facilities too. In spite of that, you have to use registry clean-upsoftware to keep the machine fast. If you do not use this software, your machine will not work properly and it will be a matter of annoyance for you.

Besides, whenever the computer is used, some temporary files are created. If these files are not erased for a long time, they occupy a lot of space in the hard disk and slow down the speed of the computer. That is why we should erase the temporary files with a software. It will make some space free and speed up the computer.

Nowadays, the use of ICT device can not be imagined without the internet connection. Many cookies and temporary internet files are saved in the cache memory of the internet browser when you surf the net. It slows down the computer. If it is not possible to clean up the cache memory everyday, it must be done in every few days' intervals. A piece of software can help you to get the job done.

Using ICT device without anti-virus, anti-spyware and anti-malware is very risky. It is an important maintenance activity that protects the users' device from the attack of virus, malware and spyware, and they can safely use their devices. Now many anti-virus, anti-malware, and anti-spyware software can be downloaded free of cost from the internet and used to protect the computer. Even these pieces of software can be updated from the internet.

The computer users can run disk clean ups and disk defragmentors to keep the usual speed of the computer. These programmes are attached with the operating system. These two pieces of software clean up the space of hardware and arrange the files in such an order so that the speed of the computer is kept up.

Installation and Uninstallation of Software

We know that the ICT devices are operated with software. These pieces of software have to be installed on the computer or on other devices. When we purchase any ICT device, the seller asks us about the software that we require. After installing the required pieces of software along with operating software, he gives it to us. In this way, we can use ICT devices, for example, computer, tablet, smartphone, etc., as we require.

The process of installing operating system software is complex, and expertise is essential for this task. In addition to the operating system software, we need different types of software. These pieces of software should be installed on the basis of our needs.

Installation of any software requires special attention to the issues given below:

- Whether the hardware of your device supports the pieces of software to be installed;
- Whether there is anything important in 'read me' file; if any, read it;

- Whether all other works are stopped during the installation; if not, the installation process often gets hampered;
- Whether the anti-virus software is turned off, and
- Whether the administrator of the operating system has the permission or not (Almost all the devices have the permission except some particular ones).

Installation of software, except the operating system, depends almost on the operating system itself. However, the process of installation is almost the same. We need the soft or the digital copy of the piece of software to install it. It can be installed from CD, DVD, pendrive, or the Internet. In most of the cases, a programme called 'Auto Run' is attached with the software. When you insert a CD and DVD or connect a pendrive to the USB port, the 'Auto run' programme becomes activated and the piece of software seeks permission to set up. Follow the next steps after giving the permission and the piece of software will be installed on your computer. After restarting the device, you will be able to use the programme.

Uninstallation of Software

Suppose that you do not need to use the software anymore. What will you do then? Most of the users keep the software in the hard disk. However, it occupies a space and creates problem to run the ICT device smoothly. Therefore, it is wise to uninstall unnecessary software.

How will we uninstall the software? The Operating System Software helps us to get the task done. The nature of all kinds of Operating System Software is almost same. However, it is easier to uninstall software from a device run by the android operating system, especially in the touch-screen smartphones. Select the application from the settings and touch the particular software. A menu will be viewed on the screen. Click the space where uninstall is written and the software will be uninstalled.

The following steps should be followed to uninstall a software from a computer or an ICT device run by Microsoft Windows Operating System.



Click the start button and go to the Control Panel. Then double-click the 'Add or Remove' or point to uninstall a programme.



Click Uninstall of the programme that you want to remove, and uninstallation will start instantly. If the bulk of the file is large, it may take longer. Usually the computer needs to be restarted after the uninstallation of software. Be careful before uninstalling any software; or else, uninstallation of a programme may make it impossible to run the computer without its reinstallation. Therefore, you must be careful.

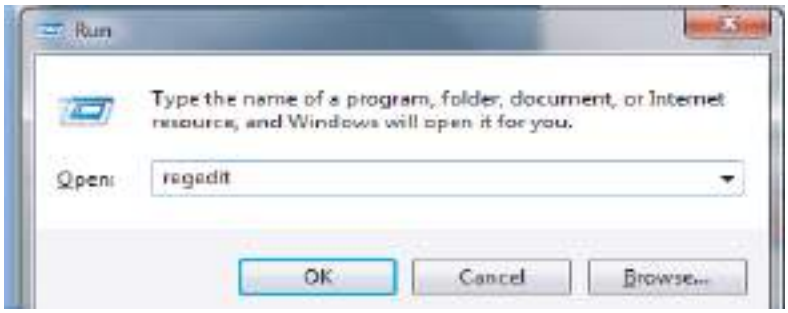
Activity
Following the steps, uninstall a piece of software suggested by your teacher.

Deletion of Software

We know that deleting means erasing something. In fact, by uninstalling a piece of software, we delete it from our ICT device. What will we do with 'delete' command then? A software once installed on the ICT device cannot be uninstalled completely, unless it is deleted by following the recommended process. Or else it creates problems. Some parts of the uninstalled programmes are dumped in the Registry file of the operating system. However, it is possible to delete any programme following the steps shown below. We should also be careful in doing the task.

The steps to be followed to delete.

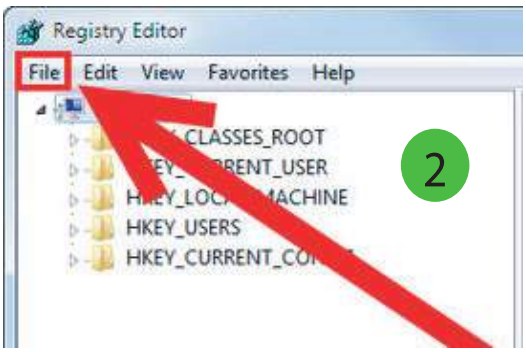
At first, uninstall the piece of software as per the previous instructions, and follow the next steps:

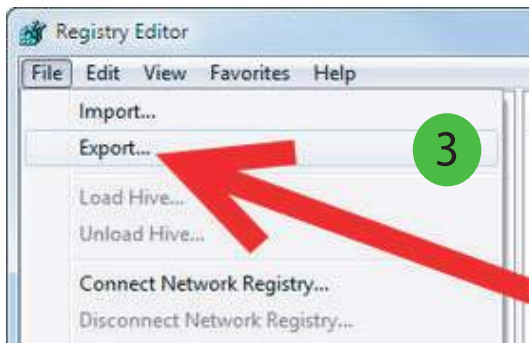


1. Pressing  +r, activate Run command. Write 'regedit', and press enter.

2. Enter the file. menu.

3 Click Export





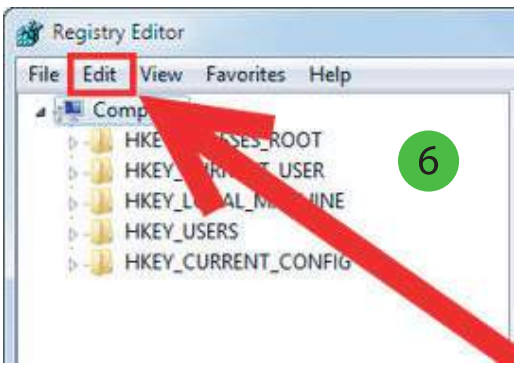
4. The drive that contains the operating software, that is C , should be selected.

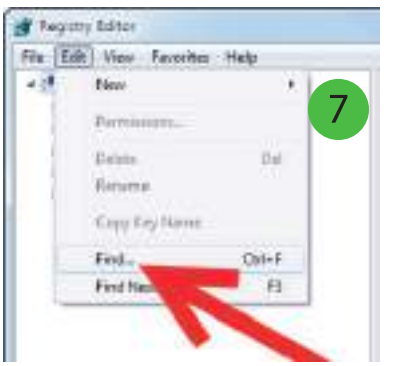


5. Save the file. It is very important so that If any error is made, the system be repaired.



6. Enter 'Edit'.





7. Point to `Find'.

8. Find out the name of the software to be deleted, for example, ADUIALS.

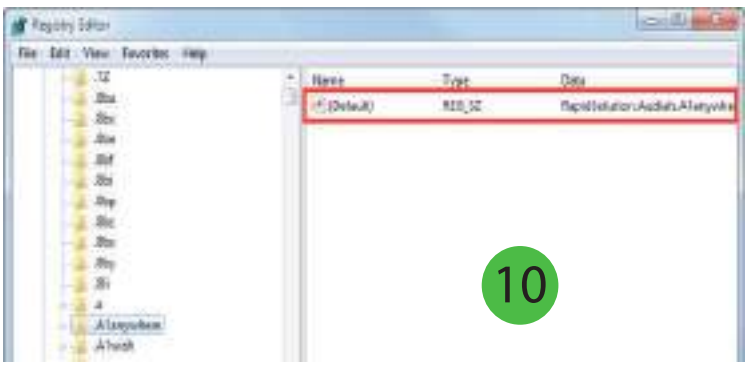
9. Click Find Next .





10. Select in this way.

11. Pressing the right button of the mouse, click the 'Delete' option.





12. Finally press 'F3' of the keyboard and delete all the files having that name from the Registry. In this way, the entire process of deleting will be completed.

Group Activity

Comparing uninstallation and deletion, present it.

Information Security and Cyber Risk

Information has become one of the most valuable resources today. There are two main types of access to information: open information and confidential information. Open data is freely accessible to everyone and can be shared without restrictions. Examples include news, articles, and press releases from organizations or institutions. It is made for public use and does not require any complex security. On the other hand, confidential information is restricted to authorized individuals or organizations and is protected by legal obligations. For example, commercial contracts, national identity cards, passwords, etc. Disclosure of confidential information without permission may result in legal complications or financial

compensation. In the age of the Fourth Industrial Revolution, digital technology has become essential for sharing personal information to meet various needs. Digital technology refers to electronic devices, systems, and tools capable of processing, storing, and transmitting data in binary form, enabling tasks like communication, accounting, and automation. However, with the widespread adoption of these technologies, individuals are increasingly exposed to cybercrimes that jeopardize their information security. The cyber-world is a digital space where people interact and access information via the internet—a virtual realm built on data, code, and the web. This parallel world continues to expand and evolve, becoming an integral part of our daily lives.

Cyber Crime

Any action that violates societal norms or the law is considered a crime. When such actions are carried out online or using the Internet, they are called cybercrimes. These crimes involve using computers, digital devices, and the Internet, and sometimes the devices or networks become targets of cyberattacks. Cybercriminals can steal personal information, putting individuals' safety at risk. Therefore, everyone must understand how to protect themselves from cybercrimes and information security threats in the digital world. Cybercrimes come in various forms, each posing unique risks to information security. Some examples of cybercrimes are listed below.

- Hacking
- Brute Force Attack
- Data Interruption
- DDoS Attack
- Computer Malware etc.

Hacking

Hacking is usually accessing or taking complete control of a website or computer network without permission. The person who hacks is called a hacker. Hacking can be legal or illegal. Some organizations hire hackers to test the security of their systems. The work of these hired hackers is called legitimate hacking. They check system security but do not harm the system.

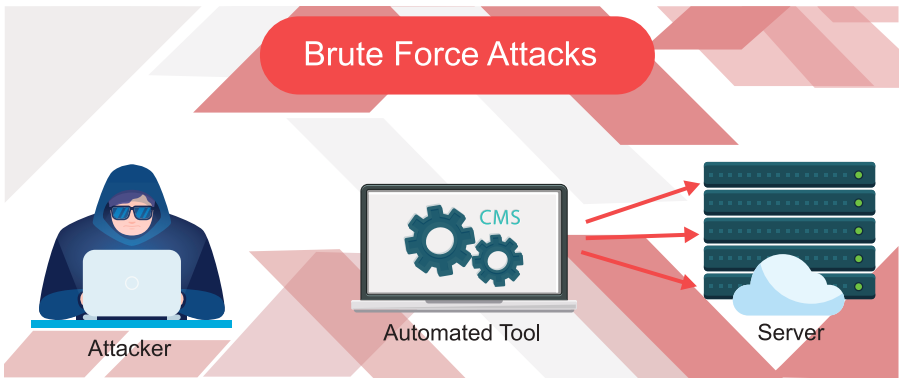
For example, there are many legitimate hackers to check the UNIX system. They are called white hat hackers. Those who do illegal hacking are also called Crackers. Illegal hackers or crackers use the Internet and other networks to steal or destroy data. They usually use several techniques to easily find out the vulnerabilities



of software systems over the Internet and find passwords.As a result, it can easily cause damage. They are called black hat hackers. The trend of hacking crime is increasing day by day. Cybercrime is committed through hacking. Hackers can view other people's e-mails, gain unauthorized access to web servers, or steal files over a network.

Brute Force Attack

Just as a thief in real life uses different keys to enter a locked room and try to unlock it, digital criminals use various types of software to illegally access people's accounts such as bank, social media, and email accounts, and in many cases even digital devices. They try to make assumptions about them one by one. Sometimes, they are successful, and if successful, they steal various personal information of the person.

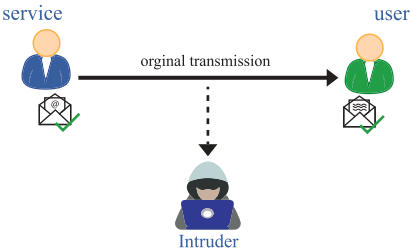


They use the stolen personal information to commit multiple crimes. This type of cyber attack is a severe cybercrime.This type of cyber attack is known as a brute force attack. It is a method in which an attacker systematically tries all possible combinations of passwords or encryption keys to gain unauthorized access to a system. It relies on trial and error, using automated tools to find each option correctly and keep trying until it succeeds. This can be effective if there are no security measures such as strong passwords or other measures to prevent this.

Data Interception

Water pumps usually irrigate land for agriculture through drains or pipes. If someone cuts this drain or pipe midway or leaks the water pipe, then the amount of water that is supposed to be received will not be available. As a result, farmers will suffer. A vigilance system should ensure that no one can illegally take water in the middle. Similarly, when exchanging informa-

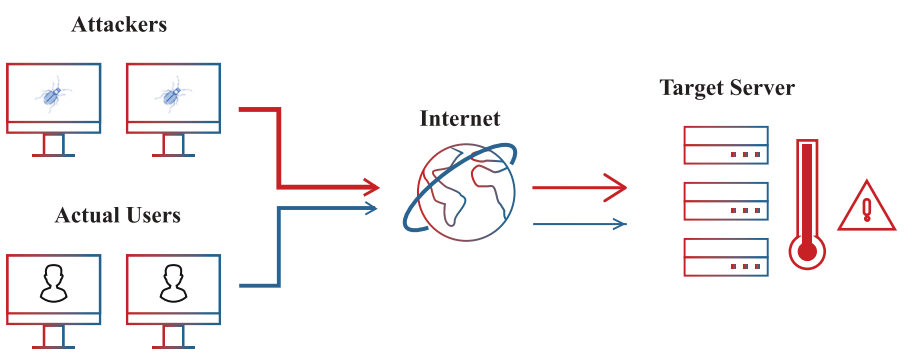
tion digitally, someone between the receiver and the sender can intercept it. This process of theft is known as data interception.



End-to-end encryption, commonly used in software or apps, ensures that data (such as messages, images, videos, voice call records, and documents) cannot be intercepted or stolen by third parties. Encryption is the process of encoding information to prevent unauthorized individuals from reading or understanding it. As a result, the data becomes unreadable to anyone without proper authorization. Confidential information transmitted over public networks is typically encrypted with a unique code to safeguard its privacy and security.

DDoS Attack - (Distributed Denial of Service)

When a person is interviewed on TV, if many people ask the person many questions at once, it becomes difficult for the person to speak well on a particular topic and wastes time. Because he can lose track of what to say and what to keep. Similarly, in the digital world, a Distributed Denial of Service (DDoS) attack uses multiple devices to attack a specific target simultaneously.



In a DDOS attack, multiple computers or devices flood a website or online service with traffic, slowing it down or causing it to crash. The attack aims to impersonate the system so genuine users cannot access or use it.

Malware

Malware is an abbreviation for Malicious Software. Malware is software designed and developed to intentionally harm a mobile, computer,server, website, or computer network. This software works against the interests of the user of mobile, computer, or any other digital system. However, if a piece of software unintentionally causes a problem to a computer system due to its incompetence, it cannot be called malware; This is called a software bug . Malware is a type of harmful software that is used to disrupt the normal functioning of a computer, mobile, or any other digital system to collect confidential information, illegally intrude into a protected computer network system or display unwanted advertisements. Malware can be of different types. Namely - Computer viruses, Worms, Trojan Horse, Spyware, Ransomware, Adware, Rootkits, Spamming etc.

Cyber Bullying

Intentionally and repeatedly harming someone mentally using online platforms—such as sending abusive messages, spreading rumors, leaking personal information, or humiliating someone on social media—is called cyberbullying. Forcing a person to do something through the use of information and communication technology is called cyberbullying or cyberterrorism. Humiliating someone socially, making threats, creating fear, publishing someone's personal information or pictures on social media without permission,publishing wrong information or spreading rumors about various sensitive issues on social media, creating chaos in society, or spreading communal hatred. All these are par t of cyber terrorism.

Mobiles, computers, tablets, devices, social media, websites, messages, e-mails, etc., are used for cyber terrorism. A person is socially humiliated, and his/her private life is disrupted by embarrassing pictures, videos, and offensive or insulting comments in e-mail or social media.

Cyber terrorism is more common among children, teenagers and young adults. As a result of this, their social and family life is affected, as well as feelings of inferiority, depression, panic.

In most cases, deleting an image, video, or information is very difficult or impossible after publishing it on social media or a website. Again, in the case of a fake ID, it becomes very difficult or impossible to find the identity of its source or publisher. So we also have to be careful about these things.

Fake News

Fake news is any false or misleading information presented as news that is intentionally spread to deceive people or influence people's opinions. It can be fabri-

cated entirely of stories or distorted information and used to mislead the public or promote a particular agenda through social media, websites, or other channels.

In this age of overuse of social media, the spread of fake news is happening at an alarming rate. Fake news spread over the internet has led to many political and religious conflicts around the world. After hearing the news that 'A kite has snached your ear' we should not run after the kite, but first of all should look at the ear. Similarly, any online post or news should be verified and believed. Various types of false news or rumors are usually spread using fake then names of individuals or organizations. According to the Information and Technology Act 2006 of Bangladesh, cyber bullying and spreading fake news on digital platforms is punishable by imprisonment of up to 10 years or a fine of up to Tk 1 crore or imprisonment and fine both.



The following tasks can be done if anyone becomes a victim of a Cyber Attack. For example:

1. Contact National Helpline 109, National Emergency Service 999 or ICT Helpline as soon as possible.
2. Assistance can be sought from someone proficient in technology.
3. Complaints can be filed on the website www.rab.gov.bd.
4. It should be shared with parents or the members of the family.
5. The digital devices need to be turned off.
6. A written complaint should be submitted to the Bangladesh Telecommunication Regulatory Comission (BTRC)
7. This issue should not be shared with strangers or discolsed publicly.
8. A general diary should be filed to the nearest Police station.
9. Consumer's rights need to be practised.
10. Evidence of the crime should be collected.

If we fall victim to such incidents, we will not keep it to ourselves but inform our parents and even teachers and we will quickly make a General Diary (GD) at the nearest police station. In our country now GD or general diary can be done online. For this, we must search by typing: https://gd.police gov.bd in the address bar of any internet browser.

Mobile application software (apps) for almost all units of law enforcement agencies such as Rapid Action Battalion (RAB), Counter Terrorism Unit (CTU), Criminal Investigation Department (CID), and Metropolitan Police such as Jawadhaar Jai, Oibhashad Inadhaar, etc are on Playstore. By downloading and keeping it on your mobile phone, you can use it to fight crime even in times of danger. Suppose someone has suffered an accident in the cyber world. In that case, they should send a GD to the nearest police station, and along with a copy of the GD send to Hello CT(Counter Terrorism) or Report to RAB or contact the cybercrime helpdesk of the nearest police station with a copy of the GD.

The Strategies for Security over the Internet

The following security strategies can be used for safe Internet use and to protect personal information and devices from online threats. namely-

- Enable Two Factor Authentication (2FA).
- Using strong passwords and not using the same password across all digital platforms.
- Updating computer software and mobile application software (apps) regularly.
- Refrain from sharing private or confidential information on social media.
- Not to share personal confidential information (pin code or password) with anyone.
- Installing antivirus and firewall protection on the device.

Two Factor Authentication (2FA)

Two-factor authentication means that when we log in with the ID and password to access our e-mail, social media, or other online accounts, an OTP (One Time Password, which is six digits long) comes to our phone or mail. We can access the account only when we give that OTP correctly; otherwise, we cannot. OTP is sent for a limited time. Once used, the OTP expires and the same OTP cannot be used again. Having enabled two-factor authentication makes it very difficult for cybercriminals to hack an account.

Nowadays, social media is very common. We use social media for various purposes and entertainment. However, we must be very careful about what personal information we should share on social media and what we should not Hackers can steal our money through social engineering from various content uploaded on our social media. We have to be aware of this.

In the practical class, the teacher will show the students the steps to implement Two Factor Authentication (2FA).

Internet Addıctıon Dısorder (IAD)



The word 'addiction' has negative connotations and it is usually used with reference to drugs. It destroys life because it is tough to come out of the web of drugs. Perhaps you are confused thinking that how an alarming and negative word 'addiction' can be associated with ICT and mentioned in an ICT textbook. Some of you who have computers may have crossed the limit while playing computer games. A few of you did not leave the computer even though you should have for an important task. The users who have the internet access have Facebook accounts too. When you post status on the Facebook, you eagerly wait for a long time to see whether somebody gives a 'Like' to your status. You feel pleasure when the number of your Facebook frıends ıncreases. Perhaps you may have spent more time on Facebook than usual. You might have done better in the examination if you had spent less time on this social network. You could have read some good books or played a bit more outside in the playground or spent more time with your family members.

Perhaps you, who have been damaging your lives by wasting your time on Facebook or by playing computer games more than you should understand the cause of adding a negative word 'addiction' with the positive words 'Computer' and the 'Internet'. 'Addiction' means when someone, in spite of knowing it is a harmful act, cannot resist the temptation of doing it. What is true for drugs is true for the computer and Internet too. As drugs are harmful for life, so are the computer and the internet if they are used beyond the limit.

Addiction to Computer Games



An addiction to computer games begins from the childhood, and it usually happens due to the ignorance of parents. A computer is a tool and different types of work can be done with it. As many positive words are said of this technology, parents think that what is done through a computer is positive. Therefore, when they see their children sitting at the computer for a long time, they do not think that they should be alert. Computer games are a kind of entertainment, and they have a different dimensions. If you play computer games merely as entertainment while staying within the limit, that can be a part of good entertainment. However this does not happen most of the time. People across age, children to adults, may be addicted to computer games. A Korean man died while playing a computer game for 50 hours at a stretch. A Chinese couple sold their child to pay for their computer games. These examples remind us that an addiction to computer games is not unusual. If caution is not taken, one can easily be addicted to computer games.

As addiction to computer games is new, extensive research has not been done on it. In future, researchers will be able to provide us with more direction. Research has identified the presence of a stimulating chemical in a gamer's brain, who is addicted to computer games. The shape of a brain is altered in those who use a computer 10 hours at a stretch 6 days a week.

Therefore, we should keep in mind that computer games could be a good entertainment, but it is very easy to get addicted to it, and the effect of it is certainly damaging.

Addiction to Social Networking Site

Man is a social being. They continued a social relationship all the time. However, the nature of social communication nowadays is distinctly different from the one in past. It means a different social networking based on the internet. There are some social networking sites such as Facebook, Twitter, Instagram, LinkedIn, Tiktok, Likee etc. through which people can communicate with their circle. Once, these sites were only for the young people, but now people of all ages use it. They use it not for communicating with others, but also for establishing ideologies and legitimising their opinions. If it was within the periphery of

objectives, it would not have created any problems, but it is a matter of regret that addiction to social networking sites has become a problem for the whole world.

The psychiatrists have started doing research on this matter, and the findings show that the success of the sites depends on how skillfully they can attract the users. The main factor is how often users visit the site and how long they remain on the site. The more the site is visited, the more successful the site is and consequently, the more money the site will earn. Therefore, if the users are not careful, there is every possibility of developing addiction to these sites.

Another interesting factor was identified by the psychiatrists. Individuals have an inherent desire to impress and admire their own self. In psychology, this is defined as 'narcissism'. The social networking sites instigate this inherent human desire. A competitive attitude develops within everyone to make themselves popular. The users upload minute information about themselves, and when people watch and like it, they become happy. The entire system works like a drug, and users waste their time for hours. In fact, a major waste of time world-wide is caused by the immense popularity of social networking sites.

The Way out of Addiction

We have already learned in the previous section that a man can be addicted to computer games and social networking sites just as he can be addicted to drugs.

Therefore, both drug and computer game or social networking site addicts display a similar kind of signs and symptoms. It is wise to be careful not to be addicted than to try to get rid of the addiction. There is an apprehension that the users who do not know anything about the addiction may develop a tendency to it. Since you have read about it in the textbook, you may remain more careful about it.

People may become too preoccupied with it, as they do with other sources of entertainment. However, playing computer games does not increase our knowledge on technology. You will just have the enjoyment of playing the computer games, not any technological knowledge. You should be careful about playing computer games, so that it may not affect the important works of your daily life.



We hope that you will not be addicted to computer games. Similiarly you will prevent the people around you from being computer game-addicts. Those who become game-addicts show some particular symptoms. They always think about a particular game, and when they start playing the game, they become excited, and they can not do their daily jobs smoothly. They become inattentive in their studies. When they are forced to keep themselves aloof from playing games, they feel discomfort. The point of worry is that the addiction may come back even after they become free from this bad habit. The people, who somehow have developed addiction to computer games and want to get rid of it, have to acknowledge themselves the fact that they have developed an addiction. They have to make a list of the important events of their life. They should convince themselves about the place of computer game on the list. They have to make a list of the problems of their life too, and they should identify the problems caused by playing computer games. They should divide and allocate their time to cover all the important aspects of life-study, homework, playground, extra-curricular activities, spending time with the family, and voluntary social works. If they get spare time after doing all of these works, they will play computer games. They should gradually keep themselves busy with creative activities rather than computer games.

The users who have been addicted to social networking sites should proceed in the same way to get rid of the addiction. They should try to convince themselves that wasting time on these websites is a kind of addiction. When you have an intention of watching something on social networking sites, you should ask yourself whether you have really any purpose of watching it. If not, you have to control yourself. You should note down the duration of time you spend every time on the sites. After summing up the time you spend on it in a day, week, and month, you should come to a conclusion about the volume of creative work you could have done during this time.

You have to reduce the number of unknown friends from your social networking site to reduce your addiction. You have to convince yourself that you can surf the sites after completing the important jobs. You have to develop the habit of deactivating social networking sites when you have exams or other important events. You will gradually reduce the addiction in this way, and finaly get rid of it completely.

You should remember that every moment of your life is valuable, and it is unwise to spend these moments for any addiction.

Piracy

The objective of copyright law is to provide the writers, artists, and others with the exclusive right to their creative work. Usually it is expensive and difficult to reprint any book by violating the copyright law, but now it is easy to make 'copy' or 'facsimile' using computer technology. It is not required to be an expert for doing the job. Therefore additional measures are taken to protect the copyright of computer software, graphics, and animation. When the legal right is violated, they are deprived of their copyright. It is usually called 'Piracy' or 'Software Piracy'.

The concerned entrepreneurs, writers or programmers can preserve the right to their intellectual property within the purview of copyright law. That is why it is illegal either to copy or create something new by editing the software without the consent of the copyright holders. Therefore, the copy or the new creation has no legal protection. Even though it is easy to pirate computer software, the malpractice is not very frequent in the world. The renowned software companies have formed an agency named 'Business Software Alliance' (BSA) to preserve their copyright and to monitor piracy worldwide. The statement given by the agency in 2011 shows that 4 out of 10 computer users are free from piracy. As software piracy is an easy task, it is difficult to get the right statistics. Software piracy is strictly prohibited in Bangladesh.

The Urgency of Copyright Law

The copyright law ensures the right or ownership of the creators to his works for a certain time. If the creation has any commercial value, the creator should get it. As poets, litterateur, movie producers, software writers, web designers all require money and earn their living from creative work, they invest labour, intellect, and money in it. They invest money for their labour and

merit of creative works. Therefore, they should have the right to get their money back either by selling or exchanging the products. The legal right within the purview of copyright law has given them the advantages. Artists or programmers get disappointed if they fail to gain any financial benefits for their creative or intellectual properties. The implementation of copyright law will save the creative workers from being deprived.

Right to Information and Security

The law of 'Right to Information' is enacted and implemented in different countries of the world to ensure the free flow of information and people's right to have information.The 'Freedom of thought, conscience, speech' and right to obtain information has been asserted as the fundamental right of the citizens in the constitution of the People's Republic of Bangladesh. All powers in the Republic belong to the people. A law called 'Right to Information Act-2009' has been enacted to ensure the right of having information. Every citizen has the right to get information from any authority whenever it is sought under the act, and the concerned authority is compelled to provide the information if asked. If people's right to information is ensured through this act, the transperancy and accountability of the government, autonomous, statutory organizations, and NGOs funded by the government and foreign organisations will be increased, corruption will be reduced, and good governance will be established. The right to information has been ensured under the Act and directives have been given to the organisations to preserve information.

The Act has ensured access to important information of the state. The accessibility of government-held information is an important part of government transparency and accountability to its citizens and good governance. However, seeking and receiving information that may jeopardise the security of the state is not permissible in the Act. For example, the Act does not allow access to questions before the public examinations because the exam processes will become controversial. The secrecy of question papers is secured through 'Right to Information Act'. If technical, technological, or scientific information is leaked out, the organisations stand to lose financially. In this context, keeping the information secret is not the violation of the rule. The most important factor is that any information that may pose a threat to the security, unity and sovereignty of the state is not obligatory to be revealed under this Act.

General Troubleshooting

It is unusual that electronic devices have not gone out of order or not created troubles during using. Some problems are very usual, and some are unusual and complicated. Usual problems can be fixed by the users, but they have to take the help of experienced people for complicated problems. Computers or ICT devices are not exceptions. Those who use electronic devices have noticed that an operating manual is given with every device. The manual contains a section on the last two or three pages, entitled, 'trouble shooting'.

Troubleshooting is the process of finding out the source of troubles. Usually some questions are given with solutions. The users, according to the nature of problems, solve them following the solutions.

In fact, trouble-shooting is a systematic process of identifying the source of problem in the ICT devices in order to solve it. In the manual, usually some possible problems and solutions in relation to the ICT device are mentioned. The users, following the basic trouble-shooting steps given in the manual, can usually resolve the problem in most of the cases. Usually the word 'Troubleshooting' is used for hardware related problems. Some troubleshootings are discussed in the next page.



Some Common Desktop Computer Problems and Solutions

Sl nos.	Problems	General Solutions
1.	Computer is not starting up.	1. Check the main power cable whether the connection is loose or not. 2. Check whether there is power on the main power-board. 3. If there is no power on the main power-board, change the main power supply unit. 4. Take the device to the local service centre and consult an expert.
2.	Nothing is viewed on the monitor though the system is running.	1 Check if the monitor light is on. If the light is on, check the monitor data cable and plug it properly if the cable is open or loose. 2. Turn off the system and unplug the power cable from tha main system. 3. Remove the RAM from the slots. 4. Clean up the connectors of the RAM rubbing with an eraser. 5. Clean up the slot of the RAM with a hard brush. 6. Turn on the computer without installing the RAM, and notice whether you get any beep sound. 7. If you get any beep sound, turn off the computer, and again turn on after installing the RAM. 8. If you get any beep sound, you have to understand that the RAM is faulty. 9. Install a new RAM if there is no display yet. 10. Install the RAM, and check again. Faulty RAM is the reason for at least half of the display problems.
3.	The system becomes very heated, and abruptly shuts down.	1. Open the Casing. 2. Remove the CPU or processor fan from the motherboard, but don't remove the processor. 3. Perhaps the heat sink is filled with dust that creates obstruction on the free flow of air. As a result, CPU can not be cooled. 4. Clean up the heat sink and fan, and install again. Now, after closing the cabinet, turn on the computer again. 5. If the problem is not solved, take the computer to a service centre, and talk to an experienced mechanic.

Sl nos.	Problems	General Solutions
4.	The computer shuts down on its own at every few minutes, but it is not heated.	1. Check the motherboard carefully and find out if there is any leaking or faulty capacitor has got loosened. Tighten the capacitor and the problem will be solved. 2. Notice very carefully as the computer running whether any IC or any other component is producing extra heat. Be cautious. Let not the board be shorted. If it happens, go to the nearest service centre.
5.	The device freezes while running Windows.	1. Check whether there is any virus in the hard disk by running an updated anti-virus. 2. Making the back-up of important data from the disk, format C drive, and reinstall Windows. It should be done by an expert.
6.	Display freezes when the power button is turned on.	1. **1st Step:** Turning off the power button and opening the casing, carefully remove the data-cables and power-cables connected to hard disk, CD-ROM, and DVD, and after reconnecting the cables, restart the computer. 2. **2nd Step:** Check RAM, processor, power supply connection separately whether they are faulty or loosely connected. 3. **3rd Step:** Check the motherboard using the processor, RAM Hard disk and other related equipments from an active computer. If it is not active, change the motherboard. Get the job done by an expert hand or taking the computer to a service centre. **Note:** Sometimes this problem persists when the keyboard and the mouseport of the motherboard are loosely connected. Set the connection properly.

Sl nos.	Problems	General Solutions
7.	The computer repeatedly freezes, and reboots automatically.	1. If the cooling fan set over the CPU does not move or cool the system properly, this promlem occurs. In that case, switch off the power, and opening the cooling fan, check it out. If the fan is faulty, replace it. Besides, check the fan behind the CPU while the computer is running. 2. The problem persists if the computer has any virus. Clean up every drive of the hard disk by running an updated anti-virus. Besides, it happens due to the installation of new hardware or programme. In that case, uninstall the programme and run the computer.
8.	Getting an electric shock when you touch the metal part of the computer.	1. If you get electric shock by touching the metal part of the computer, it is certain that the computer has not earthed. Calling a skilled electrician, get the computer properly earthed.
9.	The date of the computer is not correctly displayed all the time or if any option of the BIOS is changed, it is not properly saved.	1. If the CMOS (Complementary metal-oxide semiconductor) battery of the motherboard loses power, this problem occurs. In that case, set a new CMOS battery on the motherboard.
10.	Showing the message 'Boot Disk failure' or 'Hard disk not found'.	1. Switching off the power, open the casing, and check the data cable connected to motherboard and hard disk drive, and check the connecting point of the power cable from power supply unit to hard disk and properly connect it, if there is a looze connection. 2. Set the jumper properly following the jumper setting diagram on the back of the hard disk. 3. Entering the BIOS, check whether the hard disk is detected from the options of the BIOS either manually or automatically. If the problem is not resolved, connect your hard disk to a sound computer and check whether it works or not. If the problem persists, buy a new hard disk and install the programmes you require. Get the job done by an expert.

Sl nos.	Problems	General Solutions
11.	Showing messages like 'Out of memory' or 'Not enough Memory'.	1. Usually these messages are shown when you install excess programmes, and work keeping a lot of programmes open. 2. If the computer does not have sufficient memory for installing excess programmes, this problem occurs. Additinal RAM can be installed in the motherboard to resolve the problems.
12.	The keyboard is not working.	1. Shut down the computer, and check whether the keyboard is properly connected to the port. 2. If it is not properly connected or the connection is found loose, refix it and turn on the computer again. 3. Clean up the virus by running an anti-virus software. 4. If the problem is not fixed yet, install a new keyboard.
13.	The mouse is not detecting anything.	1. Check the connecting-cable of the mouse to the computer. 2. Change the port to see whether it works. 3. Connecting a new mouse to the port, check it again. 4. Entering the BIOS check whether the mouse is disabled. If so, enable it, and come out of the BIOS. 5. If the problem persists, connect a new mouse to the computer. The problem will be solved.
14.	No power is viewed on the monitor.	1. Be sure whether the power button is turned on. 2. Check the AC power cord connected properly to the power outlet behind the monitor.

Sl nos.	Problems	General Solutions
15.	The power of the monitor is viewed on, but there is no display on the monitor.	1. Check the video cable whether it is properly connected to the computer or not. If the other point of the video cable is not permanently connected to the monitor, fix it firm. 2. Adjust the Brightness and Contrast.
16.	The printer is not giving any printing output.	1. Check to see if the correct model of printer is selected. 2. Check the power cable connected to the printer. 3. Check whether the button of the printer is turned on. 4. Check if the data cable of the printer connected properly to the computer. 5. Opening the cover of the printer, find out whether any paper is jammed inside the machine. 6. Check whether the cartridge contains any ink. Remove the cartridge, and fix again after shaking it well. 7. If red or yellow blinking light is shown, press the reset button of the printer. 8. If the problem is not resolved, install the driver sofware supplied with the printer. 9. Consult an experienced hardware expert.

Group Activity

Discuss what other problems a computer may have besides the ones listed above. Identify some solutions to these problems.

Exercise

Sample Questions

1. What happens if there are too many temporary files?

a. The computer slows down. c. The antivirus stops working.

b. The computer speeds up. d. Internet access becomes unavailable.

2. When installing software from a CD, DVD, or USB drive, which program starts first?

a. Setup c. Read Me

b. Autorun d. Restart

3. What is the asset of the modern world?
   a. Information c. Computer
   b. Data d. Internet
4. What must be checked before installing software?
   i. Whether the hardware supports it
   ii. Whether the antivirus software is turned off
   iii. Whether administrator permission is granted

Which of the following is correct?
   a. i and ii c. ii and iii
   b. i and iii d. i, ii and iii

Read the following passage and answer questions 5 and 6:

Mr. Ikram has noticed that his computer has been shutting down unexpectedly and restarting. He has also observed a decrease in performance. He recalled that he had copied a song from a friend's USB drive, and these issues began after that.

5. What is responsible for this issue?
   a. Operating system software c. Utility software
   b. Virus software d. Antivirus software
6. As a result of this issue, Mr. Ikram's computer:
   i. May display unexpected messages
   ii. May increase the size of stored files
   iii. May show reduced memory availability

Which of the following is correct?
   a. i and ii c. i and iii
   b. ii and iii d. i, ii and iii

Short Answer questions:

1. What does computer maintenance mean? Describe one maintenance strategy.
2. Mention two things to check before installing software.
3. Why is it necessary to uninstall software?
4. What is e-learning? Write one advantage of e-learning.
5. Why are both uninstalling and deleting software necessary?
6. What is cybercrime? Give an example.
7. What do white-hat hackers do?

Third Chapter

Internet and Introduction to Web



After completing this chapter, we will be able to—

- explain the concept of digital content;
- explain the significance of the Internet in education;
- identify the fields of using Internet in an academic curriculum;
- explain the importance of ICT in career development;
- make a presentation on a related topic with the help of Internet.

Internet

We have already learned that the Internet is a global network that connects computers and devices around the world. It is used to enable people or devices to share information and communicate with each other via wire or wireless. It is also used to browse websites, send emails or chat with friends. It uses digital content.

Digital Content

If any content is preserved, expressed or exchanged as digital data, that is digital content. However, it can be preserved either in a digital or in an analogue system. Digital contents can be exchanged either as files of the computer or through the digital system. Written information, images, sounds or videos anything could be digital contents.

Types of Digital Content

Any information, image, sound or everything expressed through a digital media is digital content. They can be divided into four major categories:

- Text or written content;
- Image;
- Sound or audio and
- Video and animation.

Text or written content: The written content is still voluminous in digital media. It includes all kinds of written information, such as essays, blogposts, list of commodities and citizen's charter, prices of commodities, e-paper, reports, etc.

Image: All kinds of pictures, photographs, sketches, and computer images such as illustrations, cartoons, info-graphics, or animated pictures are the contents of this sort.

Sound or audio: All the contents of sound or audio are included in this content. Any kind of audio file along with the broadcast on the Internet and webinar are audio content.

Video and animation: The volume of video content is increasing day by day, as nowadays mobile phones also have the ability to record video. Similarly, the volume of video content in the Internet is gradually increasing for the video sharing site like Youtube. Besides, direct telecast of some events is very frequent on the Internet. It is called 'Video Streaming' which is also regarded as a video content.

E-book

E-book or electronic book is the electronic format of the printed book. As it is published through an electronic medium, sound, animation, etc. can easily be added to it. These books can only be read either by using computer or e-book reader. Kindle of Amazon.com is the most popular of all e-book readers.

Benefits of Using E-book

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5. As e-books can be purchased through Internet, they do not incur any shipping or packaging costs.
6. E-books are easy to distribute and sell.
7. E-books can be printed out according to individual demand, and hence, they are financially more viable.

Different types of E-book

Nowadays, different kinds of e-book can be found. Different publication requires different e-book format. Usually e-books are divided into the following five categories:

- Exact copy of a printed version: These books are like their printed versions. They are published in the pdf (portable document format) format. The complete texts or parts are available on the internet.
- E-books that are only readable on the internet: These books are usually published in the HTML. This is called the website of books.
- E-books like printed version with some additional facilities: In these books, the readers have the facilities to comment and to know word meaning. Most of the books are published in (EPUB) format. These books are possible to read by using a special device, for example, ibooks and kindle reader, but the kindle and ibook reader have their own compatible format.
- Smart e-book: Audio, video, animation, etc. are included in these books along with the written part. These books are called smart-e-books. Its content is enriched with interactive multimedia features. For example, there are quizzes, spaces to answer the quizzes, and options to check the answers. 3D images are added to these e-books. However, some e-books are formatted in such a way that they can be accessed with a specific electronic device and

hardware. For example, ibooks created by Apple computers can only be read with an ipad or mac computer.

- Apps of e-book: The e-book itself is published as an app on the computer or on the mobile phone. The e-book, like the printed version, is published under the Copyright Act.

The Internet in Education

We discussed 'e-learning' in a previous chapter where we showed how education and training can be imparted by using radio, television, CD-ROM, personal network, and the Internet. In this chapter, we will have discussions especially on the role of Internet in education.

You are very much familiar with the word 'Internet'. Many people are using it. This technology has brought about a significant change to the world, and some infrastructural facilities and financial solvency are required to use it. Either a desktop or a laptop computer is necessary to use the Internet. It is expensive and cannot be afforded by the majority of the population. Nowadays mobile phone technology has been upgraded and the 'Smartphone', which can provide the internet facilities, is within the reach of most people. However, the smart phone is not always an effective tool for educational purposes. The screen of the mobile phone is so small that its use is confined within the limit of viewing and exchanging information. A recent invention, the tablet-an electronic device typically smaller than a laptop, but larger than a smartphone, can be used in education easily. Many companies are designing applications suitable for tablet to use in education.

We can not avail the internet facilities just by having a desktop, laptop, tablet or smartphone suitable for internet-use. An internet connection is required for that, but it is not equally available in all the places of the country. The speed is not the same. Sometimes a slow-speed internet makes its use meaningless. On top of it, fast and high speed internet service cannot be afforded by the general people of our country. Therfore, the students should get the internet connection at low cost to use it in education.

Our students' access to a laptop or tablet and high speed internet will not ensure the use of ICT for their education. The main question is what they will use in the internet. Is there any content suitable for them? In fact, there is not much content available on the Internet in the Bangla language. Initiatives have been taken by the Government, organisations, and individuals for developing content in Bangla. We expect to get it very soon in the internet.

Many educational contents are now available on the internet. If a student cannot understand anything while studying, he/she is sure to get a solution by giving a search on the internet. If a student wants to learn anything, he/she will find

it on the internet. The technologists of our country have successfully made effective search engines. But proficiency in the English language is needed to use these search engines.

There are useful websites for mathematics on the Internet in which the answers of any mathematical problem can be found. There are websites for practical of scientific experimentations. Expert groups are formed by enthusiastic people, and when problems are placed before them, they solve it. There are also some useful sites available on the Internet for teaching Bangla.

A vast world of knowledge is on the Internet. Now we know that internet plays a vital role in any disastrous situation. Use of internet in education will be significant in near future.

The Internet and My Academic Subject

Perhaps you hear that a teacher is like the flame of a light, and in darkness, they kindle the light of knowledge that illuminates everything and the students see the ways in the light. In other words, the best teachers in the world cannot teach anything, but they can only help the learners to learn everything themselves.

Similarly, access to good content on the Internet will not always ensure great learning experiences and sound education for students. The Internet only provides them with the opportunity to open a new world of knowledge. It depends on the students themselves how much they learn from it. You must have come across students who waste time on the Internet, either by playing computer games or by being engaged in social communication sites. By contrast, some students learn computer programming availing themselves of the opportunity.

You have certainly noticed that all of your textbooks are available on the Internet. In the beginning of the year, you get the textbooks, but if any book is either lost or damaged for some reasons, you can download it.

You will be pleased to know that some enthusiastic educationalists of our country have started making oral versions of the textbooks in soft copies, so that blind students can be benefitted from these oral versions.

NCTB publishes all the textbooks and sends it to you free of cost. Besides, many supporting books are also written(we are not talking about the guide books that actually do not contribute to learning). Those who write these textbooks upload them on the Internet. Students can download these books directly from the internet without purchasing them from the market. Many writers of the world

Activity

How can the blind people be benefited by using digital content? Write a report within 1000 words by taking help from the Internet.

have arranged their books to be available on the internet. If you surf the internet, you will get your favourite books free of cost. However, you should be cautious about downloading any book preserved online, keeping in consideration the Copyright Laws.

We know that our students are not satisfied with what they get in the textbooks. Therefore, they open science, mathematics or literary clubs. Once, students could participate in the activities of the clubs physically, but now they have access to the clubs virtually open on the Internet. Now students of the whole world can participate in the activities of the clubs and increase their academic competence. Now-a-days olympiad on different subjects are being arranged in our country. You are increasing the fame of our country by participating in the olympiad.

Web page

A web page or web in short is a type of document that is suitable for use on the World Wide Web (World Wide Web-www) and Internet browsers. Therefore, the file kept on the server of different countries for the use of Internet users is called Web page. Web pages are usually created using HTML (Hyper Text Markup Language- HTML). In addition to text or writing, images, graphics, animations, web pages may contain various types of data files, videos, audios, etc., and links or hyperlinks to other pages. And various types of program files are required to display the content of the web page in the browser.

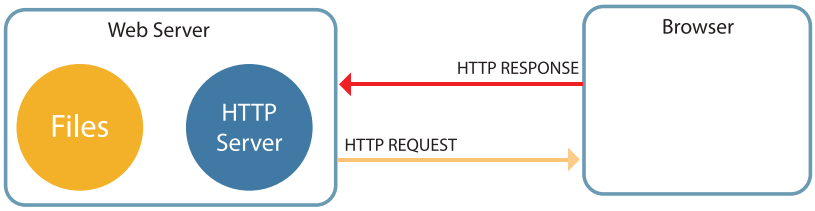
Web Site and Web Portal

A website is an allocated space or location of a computer properly connected to the Internet to store one or more web pages.On the other hand, a web portal is a collection of links, content, and services within a website that are presented simply to inform users. Any of the services on the website can be a part of the web portal. For example: knowing the flight schedule and ticket booking from the web portal of an airline company.

Product advertising and product buying and selling services on e-commerce websites are also part of the portal. A portal page manages to present information from an external source. As an example, Bangladesh Government's 'Bangladesh National Information Broadcasting' portal (www.bangladesh.gov.bd) can be mentioned from where there is a system to get all kinds of necessary information at the government level of Bangladesh.

Web Server and Web Client

A website has two parts. Namely- webserver and web client. Client software takes user input and sends data to the server called request. According to the data of the client, server sends a response. Webserver is a special kind of Hardware or Software that can provide services to a lot of clients at the same.



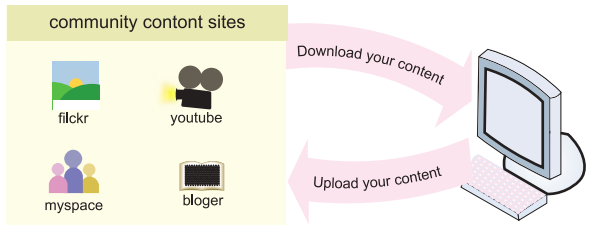
For example, all forms of the Bangladesh government are available at forms.gov.bd. For the convenience of the public, all the necessary forms of the Government of Bangladesh are stored in a web enabled database which can be accessed by anyone on the Internet from that address.

Generally, data is accessed from the database of an organization through web browser software and displayed on the customer's computer. Through the use of various levels of middleware and other software, users can access previously protected data over the Internet or local area network. For example, a buyer can search online through a web browser to find out the price of the desired product in the website created through the web and database of various vendors. A buyer can even access the seller's website from the comfort of his home through web browser software.

Web Client: On the Internet and World Wide Web, a user or client usually sends a request for data or information to the web server using HTTP (Hypertext Transfer Protocol) or HTTPS (Hypertext Transfer Protocol Secure) protocol. Client requests are usually sent through the web browser and the result of the request is received from the web server which is usually displayed in the web browser itself. TCP/IP (Transmission Control Protocol / Internet Protocol) protocol is a type of communication protocol used on the Internet to send messages .

Downloading: Downloading over a computer network is the process of getting information from a remote system to a local system. That is, to store any information from the computer network or the Internet on one's own computer or device. For example: Saving a file from an e-mail or website to your device.

Upload: Upload is sending data from local system to a remote system using the Internet or the network. For example: If someone sends a file by e-mail, it is saved on that e-mail server.



Web Browser

The Internet is called the ocean of information, because the Internet makes it possible to use all the information that is available on all the computers connected to the network spread across the world. The software that works to display Internet information or Web page or World Wide Web-WWW is called Web browser.

Web Browsing is visiting interconnected Web pages or WWW hosted on web servers in different countries of the world. Various information can be brought to the user's computer by web browsing. There are different types of software for web browsing. These web browsers usually display the web pages that are stored in the web server computers connected to the Internet in different parts of the world. In 1990, Tim Barnes Lee created the first web browser called World Wide Web. Note that the World Wide Web is known as the world's first web browser.

Below are the names of some of the popular web browsers at present. Namely –

- Internet Explorer (Internet Explorer) or Microsoft Edge
- Mozilla Firefox
- Safari
- Opera
- Chrome
- Internet Explorer
- Google Chrome etc.



Various words used in Web Browsing software are given in the next page -

URL: The complete address of a web site or page is called URL. The full form of URL is Uniform Resources Locator. For example: http://www.shikha.com; But note that only www.shikkha.com or shikkha.com is not called URL. A URL has three

parts. namely (1) protocol name, (2) hostname and (3) Name with location of the file. For example-



Note that there is only one website with one name in the world.

Home page: The main page of an organization, company or person's web site is called Home page. It is usually set on the Start page. The web page that is set as the start page on the web server is the user's homepage. That is, the page that appears as soon as the web address is typed in the browser is the home page.

Bookmark: Bookmark is a web page list, from where you can directly go to that web page by selecting the name of a web page.

Reload/Refresh: Reload/Refresh command should be given to know whether there has been any change in the middle while reading the web page whose data is constantly changing. Reload / Refresh command is very important especially for dynamic webpages.

Stop: When data is downloaded on a web page and midway it is decided not to view that web page, then the download must be stopped by clicking on the Stop button.



Search: Finding something on the internet is called Search.

Search Engine : Search engine is a software tool that finds information from the world wide web. For example - Google, Yahoo, Bing, MSN, Ant etc.

Exercise

Sample Questions

1. What is essential to access a website?
   a. Desktop PC c. Smartphone
   b. Tablet PC d. Internet connection

2. What is the primary component of information and communication technology?
   a. Computer c. Internet
   b. Television d. Smartphone

3. Digital content includes:
   i. E-books, blog posts, and e-articles
   ii. Infographics and animated images
   iii. Audio and video streaming

Which of the following is correct?
   a. i and ii c. i and iii
   b. ii and iii d. i, ii, and iii

Read the passage and answer questions 4 and 5:

Rini and Roni's father bought them a tablet PC. Rini is in class 9, and Roni is in a lower grade.

4. The best use of Rini and Roni's tablet PC would be:
   a. Playing games c. Accounting
   b. Listening to music d. Studying

5. To make the most use of their tablet PC, Rini and Roni need:
   i. High-speed internet connection
   ii. Affordable internet access
   iii. Improved English language skills

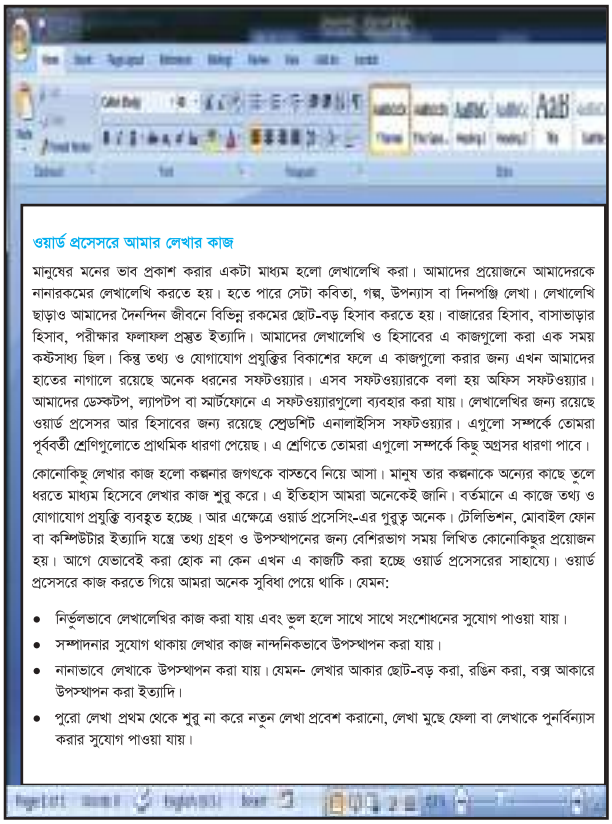
Which of the following is correct?
   a. i and ii
   b. i and iii
   c. ii and iii
   d. i, ii, and iii

Short Answer Questions:

1. What is an e-book? Mention one advantage of e-books.
2. What is downloading and uploading?
3. What is a web browser? Write the name of one web browser.

Fourth Chapter

My Writings and Accounts



ওয়ার্ড প্রসেসরে আমার লেখার কাজ

মানুষের মনের ভাব প্রকাশ করার একটা মাধ্যম হলো লেখালেখি করা। আমাদের প্রয়োজনে আমাদেরকে নানারকমের লেখালেখি করতে হয়। হতে পারে সেটা কবিতা, গল্প, উপন্যাস বা দিনপঞ্জি লেখা। লেখালেখি ছাড়াও আমাদের দৈনন্দিন জীবনে বিভিন্ন রকমের ছোট-বড় হিসাব করতে হয়। বাজারের হিসাব, বাসাভাড়ার হিসাব, পরীক্ষার ফলাফল প্রস্তুত ইত্যাদি। আমাদের লেখালেখি ও হিসাবের এ কাজগুলো করা এক সময় কষ্টসাধ্য ছিল। কিন্তু তথ্য ও যোগাযোগ প্রযুক্তির বিকাশের ফলে এ কাজগুলো করার জন্য এখন আমাদের হাতের নাগালে রয়েছে অনেক ধরনের সফটওয়্যার। এসব সফটওয়্যারকে বলা হয় অফিস সফটওয়্যার। আমাদের ডেস্কটপ, ল্যাপটপ বা স্মার্টফোনে এ সফটওয়্যারগুলো ব্যবহার করা যায়। লেখালেখির জন্য রয়েছে ওয়ার্ড প্রসেসর আর হিসাবের জন্য রয়েছে স্প্রেডশিট এনালাইসিস সফটওয়্যার। এগুলো সম্পর্কে তোমরা পূর্ববর্তী শ্রেণিগুলোতে প্রাথমিক ধারণা পেয়েছ। এ শ্রেণিতে তোমরা এগুলো সম্পর্কে কিছু অগ্রসর ধারণা পাবে।

কোনোকিছু লেখার কাজ হলো কল্পনার জগৎকে বাস্তবে নিয়ে আসা। মানুষ তার কল্পনাকে অন্যের কাছে তুলে ধরতে মাধ্যম হিসেবে লেখার কাজ শুরু করে। এ ইতিহাস আমরা অনেকেই জানি। বর্তমানে এ কাজে তথ্য ও যোগাযোগ প্রযুক্তি ব্যবহৃত হচ্ছে। আর এক্ষেত্রে ওয়ার্ড প্রসেসিং-এর গুরুত্ব অনেক। টেলিভিশন, মোবাইল ফোন বা কম্পিউটার ইত্যাদি যন্ত্রে তথ্য গ্রহণ ও উপস্থাপনের জন্য বেশিরভাগ সময় লিখিত কোনোকিছুর প্রয়োজন হয়। আগে যেভাবেই করা হোক না কেন এখন এ কাজটি করা হচ্ছে ওয়ার্ড প্রসেসরের সাহায্যে। ওয়ার্ড প্রসেসরে কাজ করতে গিয়ে আমরা অনেক সুবিধা পেয়ে থাকি। যেমন:

- নির্ভুলভাবে লেখালেখির কাজ করা যায় এবং ভুল হলে সাথে সাথে সংশোধনের সুযোগ পাওয়া যায়।
- সম্পাদনার সুযোগ থাকায় লেখার কাজ নান্দনিকভাবে উপস্থাপন করা যায়।
- নানাভাবে লেখাকে উপস্থাপন করা যায়। যেমন- লেখার আকার ছোট-বড় করা, রঙিন করা, বক্স আকারে উপস্থাপন করা ইত্যাদি।
- পুরো লেখা প্রথম থেকে শুরু না করে নতুন লেখা প্রবেশ করানো, লেখা মুছে ফেলা বা লেখাকে পুনর্বিন্যাস করার সুযোগ পাওয়া যায়।



After completing this chapter, we will be able to–

- explain the important aspects of a word processor;
- describe the technique of using a word processor;
- explain the important aspects of a spreadsheet;
- idnetify the fields of using a spreadsheet;
- describe the technique of using a spreadsheet;
- edit by using a word processor;
- keep the details of account by using a spreadsheet.

My Writing on Word Processor

Writing is a medium of expression. We have to write for different needs. It might be a piece of literature like poem, short story, novel, diary, etc. In our daily life, we have to maintain different kinds of accounts, both big and small, like expenditures of daily necessities, house rent and result sheet of examination, etc. Once, writing and keeping these accounts were very difficult, but now we have a lot of software for doing these works due to the development of information and communication technology. These software are called office software. These software can be used in our desktop, laptop and smartphone. We have word processors for writing and spreadsheet analysis software. You got a preliminary idea about these in the previous class. Now you will get advanced ideas regarding these topics.

Writing of anything means bringing the imaginary world to reality in words. We know that human beings started the art of writing to communicate their thoughts and their ideas and convey their imagination to others. Now ICT is being used in this work, and the importance of word processing is immense in this regard. Something written is required for receiving and presenting information on television, mobile phone or computer. Now all types of writing are done by the help of the word processor. The word processor provides lots of facilities in terms of writing.

- Any correction in writing can be done immediately. Because of the varieties of editing options, any piece of writing can be presented aesthetically.
- A piece of writing can be presented in different ways, for example, by enlarging or shortening the font-size, colouring, making boxes, etc.
- There are facilities of inserting new paragraphs, deleting parts or rearranging the whole writing without composing the piece of writing from the beginning.
- A document can be more attractive by inserting photographs, graphs, tables, charts, etc.
- A document can be saved and used again at any time. The same work needs not be done repeatedly.
- Any part of a document can be copied to another one, if necessary.

- It is possible to work with several documents simultaneously.
- By using find-replace command, a word in a big document can be found and replaced quickly.
- When a document is needed for a repeated use, it can be saved as template to avoid the wastage of time. For example, if it is required to prepare a lab-report every week, it can be saved as a template.
- In a large document, such as, a research paper, tables, references, images, bibliography, etc. can be inserted and edited within a very short time.
- Spelling errors can be corrected easily by the spell-checker. Automatic correction of spelling is also possible in the word processor with its built-in programmes.
- It is possible to print a document as many times as required by saving it.
- A document can be sent to any destination through the medium of electronic communication.
- Files prepared in the word processor can be preserved easily.
- File management, an indispensable part of the modern office management, has become easier for the word processor.

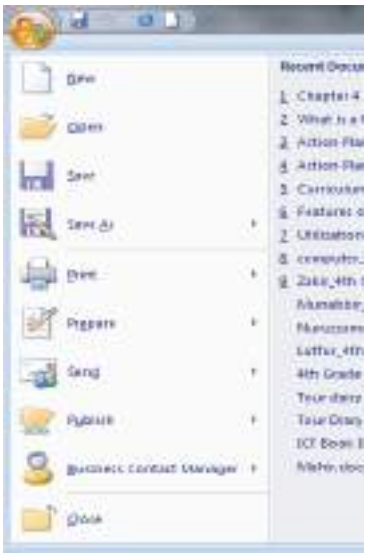
Besides, these the word processing software provides more facilities. The number of users are gradually increasing day by day due to its usefulness.

In the previous class, you learnt the process of creating and opening a new document in the word processor. Now we will learn some new techniques for which you need to use your knowledge and skills you have developed earlier. We know that Microsoft Office is the most popular and widely used software in the world. In addition, there are various types of office software available. We can use any one of them. At present, many people are using the latest versions of these. However, if someone is experienced in using one version, it is not difficult to use another. Since Microsoft Office is the most commonly used office software in Bangladesh, we will discuss Microsoft Word and Microsoft Excel based on Microsoft Office 2007. If you wish, you may use the latest versions of these software.

Office Buttons and Its Options

A new window will open after running word 2007. This  icon at the left corner above this window is the office button. The options you will find by clicking the button are shown in the following image:





The following options are most important:

New: This button is to be clicked for opening a new document.

Open: It is to be clicked to open a document saved previously.

Save: To save a document, this button is to be clicked.

Save as: This button is to be clicked to save a document in several different names keeping the original one.

Close: This button is to be clicked to close an opened document.

Formatting Text: Selecting Font Style and Colour

You have already learnt how to write using a word processor. What will be the impression if an organised piece of writing is presented in a colourful way? Certainly, it will look good. This task is called 'Formatting Text.'



There are letters of different styles in a word processor. These are called 'Font'. In formatting a text, the selection of font comes first. This selection is done from the name of the font of font group from the drop-down box on the home-menu. Pick the font that you like out of numerous fonts. Sometimes, it is required to use fonts of different styles either to highlight or specify words or phrases. In that case, select the requisite section of writing, select the font in the similar way. Click the number from the dropdown box at the right side of the font box to determine the font size. You can select the font colour as you like. Clicking on the icon of the dropdown box of font group, the colour can be selected. There are more facilities of fonts in the font group of home tab.

Activity
Composing a paragraph from your textbook in the word processor, format it by using different font style, size and colour and finally save the document, giving a name.

Formatting Text: Bullets, Numbering and Line Spacing

Our Fruits

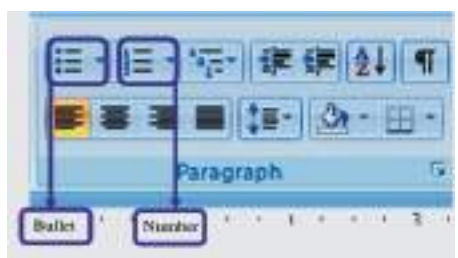
- Mango
- Blackberry
- Litchi
- Jackfruit
- Coconut

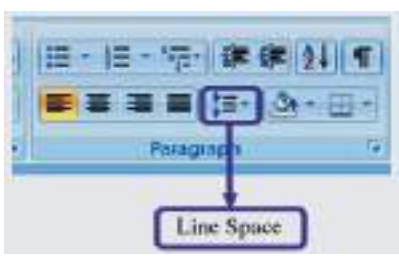
Our Rivers

1. The Padma
2. The Meghna
3. The Jamuna
4. The Surma
5. The Bhairab
6. The Tista

Sometimes we make lists of different things, and use either signs, or letters or numbers to maintain serials. This is called bullets and numbering in the word processor.

There is an icon command for bullets and numbering in the paragraph group of the home tab.





Line Spacing : This tool is used to determine the space between two lines.

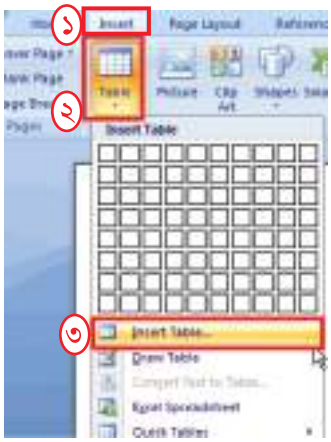
Activity
Write down the names of some of your favourite cricket players by using bullets and numbering.

Formatting Text : Table and Different Illustration

The insert tab of ribbon is used to insert a table, image, clip art, different shapes, chart text box, word art, etc. into a document.



Insert Table

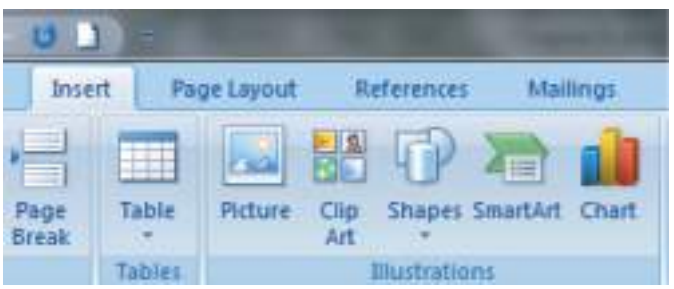


Click the (1) Insert tab on the ribbon of word 2007 to add a table. (2) Then click table and click (3) Insert table. You will get a dialogue box where you have to select the number of columns and rows.



Activity
Make a group of 10 students, and arrange the name, father's name, age and roll number of each student in a table.

Insert Picture



By inserting pictures, document can be presented in attractive way. For example, you are watching a lot of pictures along with writings in this text. You have to click the insert tab of the ribbon of word 2007. Then click the picture icon of the illustration group. A dialogue box will come. Select a space for the picture and the picture will be inserted into the document. Besides,

facilities of inserting clipart, shapes, smart art, chart, etc. are provided in the illustration group.

Activity
Insert a picture in the document prepared by you with the help of your teacher.

Insert Word Art



You can insert fonts of different styles from the insert tab, and to choose your style, you have to click word art of insert tab's text group. A dialogue box will come, and you will get the desired style of your text after selecting the font.

Setting up Margin

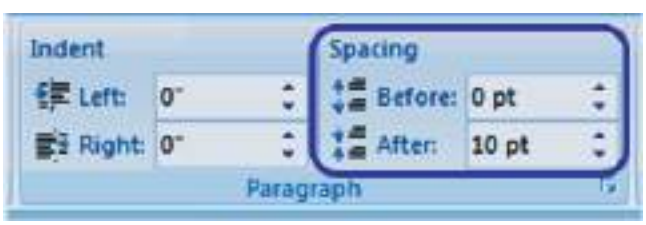


It is required to click the page lay out tab of the ribbon to determine the margins of the text. Then clicking the margin icon, desired margin is to be set. Different options of margins will be on the screen when you click on the margin icon. You can select the margin from the options or use your own margin clicking the custom margin.

Activity : 1
Render the name of your school in different styles of word art.
Activity : 2
Set the margin after preparing a document.

Line Spacing of Paragraph

Click the page lay out tab to select the space between lines of a document. It is needed to select the points before and after lines in spacing of the

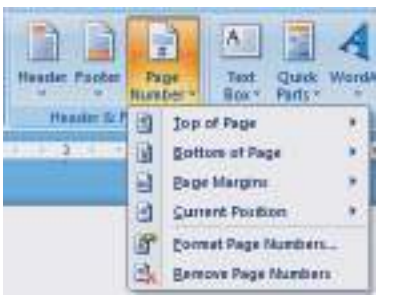


paragraph group. The command can be given after composing the document. In that case, first, the section of the document in which line spacing will be inserted should be selected. Then it can be determined as per the instructions given above.

Activity
Compose a part from either from your Bengali or English textbook and determine the line spacing.

Insert Page Number

Inserting page number on every page is an important task while composing any document. Clicking the page number of the header and footer group in the insert tab on the ribbon, the right option can be chosen. You can insert page number either on the top or at the bottom of the page.



Activity
Save a document composed by you giving page number.

Spellcheck and correction

One of the great benefits of word processing software is spellchecking. Any spelling mistakes anywhere in the document can be checked and corrected. Grammar can also be corrected in many cases. New words can be added to the program's dictionary for spellchecking. The spellchecker detects misspelled words and presents some possible correct words, so that the user can choose the correct word. At this time, the default language of the dictionary has to be determined. Otherwise, the apparent correct spelling may appear incorrect. For example, if a word processor dictionary has American English language selected and in the word document colour is entered, it will be detected as a misspelling. Because colour is spelled in British English; it



would be color in American English. Also, the spellchecker identifies scientific names, names of individuals, organizations or places as errors. The user has to ensure whether these words are correct or not.

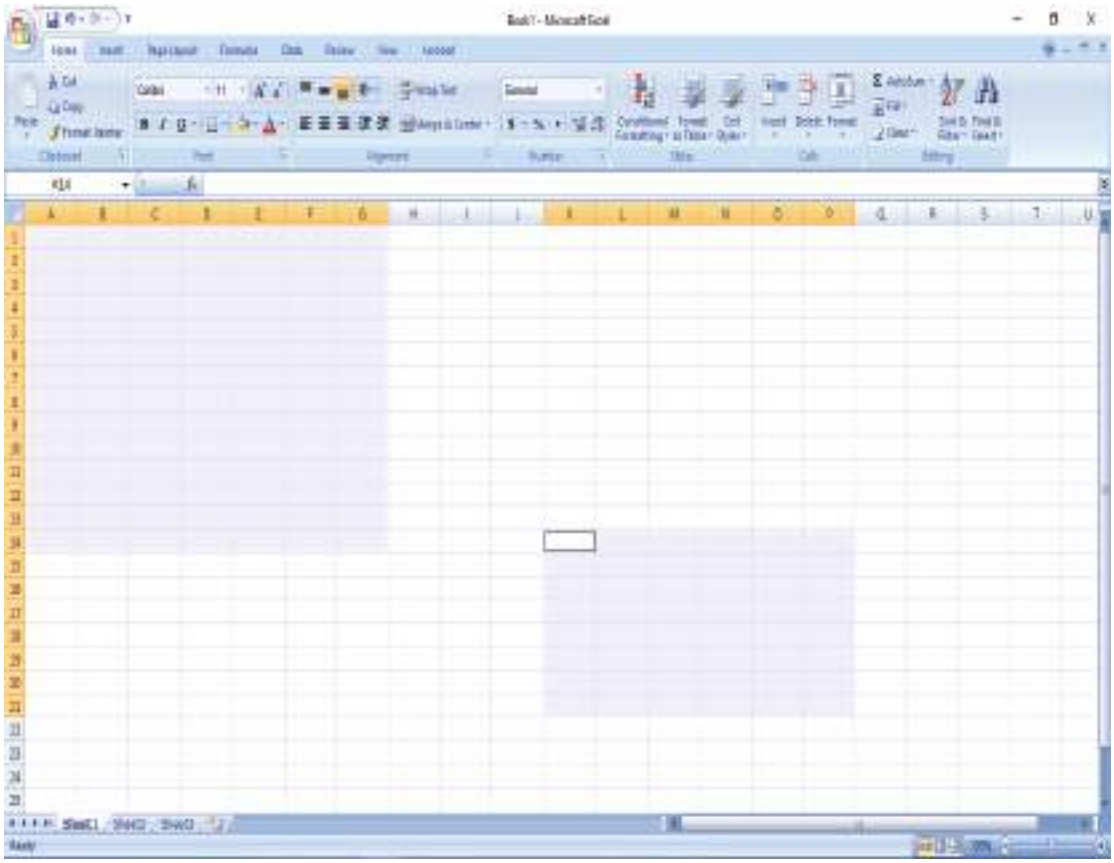
Spreadsheet and My Accounts

Analysis of Spreadsheet

Let us have a look again on what the specialities of spreadsheet analysis are.

Specialities of Spreadsheet Analysis:

It is possible to work with statistics and letter-based data;
It is advantageous for any kind of accounts;
Classification is easier for the rows and columns;
It is possible to work with voluminous data by using formulae;



- Analysis of data can easily be done by using different functions methodically;
- Data can be presented with graphs, charts, etc.

Different Uses of Spreadsheet

A spreadsheet is an interactive computer application software used for organisation, analysis and storage of data in tabular forms.

Different uses of spreadsheet are given below:

- analysing exam results in the education sector;
  maintaining income and expenditure accounts;
- preparing budgets;
- maintaining records of employee salaries;
- making reservations for services, such as airlines;
- calculating and analysing income tax;
- counting votes in elections;
- analysing and evaluating performances of players.

Technique of Using Spreadsheet

You have already got some fundamental concepts of spreadsheet. You will get advanced ideas in this book.

Multiplying

Put the formula in the result cell for multiplying in a spreadsheet. Formula always start with "=" equal to. Multiplying process is of two kinds:



1.Usually By pressing the enter button, after putting the formula into the result cell.

2.By pressing enter button writing spreadsheet function= PRODUCT in the result cell and giving the cell range.

D3 =PRODUCT(B3:C3)

	A	B	C	D
1	Monthly Shopping Expenditure			
2	Product Name	Price (tk)	Quantity (Kg)	Expenditure
3	Rice	44	40	1760
4				

The facility of multiplying by using function is that the result of multiplication of numerous cells can be done by range, if necessary. The process of multiplying 3 cells is shown in the picture below:

D3 =PRODUCT(A3:C3)

	A	B	C	D
1	Volume of Cube			
2	Length	Width	Height	Volume
3	40	15	14	8400
4				

Activity
Opening a file of spreadsheet, multiply some imaginary data.

Method of Dividing

Dividing can also been done on the spreadsheet by a formula. You have to write '=A1/B1' in the result cell to divide A1 by B1. Here the sign / is used as the sign of division.

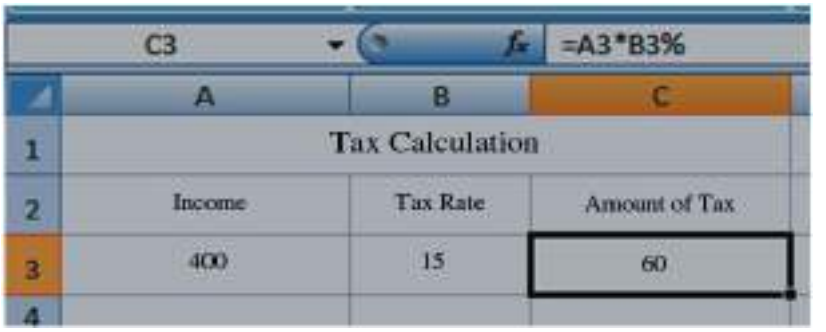
C3 =A3/B3

	A	B	C
1	April 2025		
2	Monthly Income	Number of Days	Daily Income
3	36000	15	2400

Activity
Try to find out the result by using the formula.

Calculation of Percentage

How much is 15% of Tk. 400? What is the selling price at profit 16% at the purchasing cost Tk. 1200? We frequently need to do this sort of calculations in our practical life. We can do these calculations on the spreadsheet.



To solve the first problem on the spreadsheet, put formula =A3*B3% in the result cell. The process of writing the formula in the result cell by using keyboard is to write the sign = and click the cell where 400 is written. Then press * and click the cell where 15 is written. Then writing % (press shift key and 5), press the enter button. You will get your result.

The formula =A3*B3%+A3 should be used to solve the second problem. The process of writing this formula is similar to the process mentioned above.

Activity

Solve the problems of calculating percentage under the guidance of your teachers.

The monthly basic salary of Mr. Chowdhury is Tk 16500. He draws residential allowance at the rate of 55% and medical allowance Tk 700. He subscribes Tk 90 to the benevolent fund. What is his monthly net salary?

* Because of the version of software there may be difference in title and menu bar.

Exercise

Sample Questions

1. Why is a document saved as a template?
   a. For aesthetics
   b. For repeated use
   c. For rearranging
   d. For easy copying
2. Which option is used to save a document for the first time?
   a. New
   b. Open
   c. Save
   d. Save As
3. Spreadsheet analysis helps with:
   i. Easier writing
   ii. Using formulas
   iii. Formatting data

Which of the following is correct?
   a. i and ii
   b. i and iii
   c. ii and iii
   d. i, ii, and iii

Read the passage and answer questions 4 and 5:

Soumitra writes for a newspaper about nature as a hobby. Sometimes, he includes pictures of flowers, birds, or rivers with his writings. Professionally, he works as an accounting officer, where he manages employee salaries and submits monthly reports.

4. Which software does Soumitra need for his hobby?
   a. Word processor
   b. Spreadsheet
   c. Graphics software
   d. Database
5. In his professional work, Soumitra needs to:
   i. Use templates
   ii. Use formulas
   iii. Format data

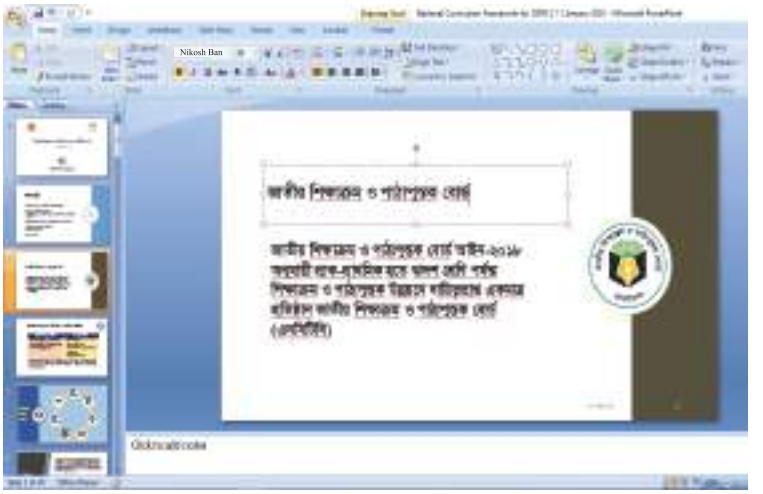
Which of the following is correct?
   a. i and ii
   b. i and iii
   c. ii and iii
   d. i, ii, and iii

Short Answer Questions:

1. What is a word processor? Mention one advantage of using a word processor.
2. What is a font? How is a font selected?
3. Describe the process of adding an image to a document.
4. What is a spreadsheet? Mention one use of a spreadsheet.

Fifth Chapter

Multimedia and Graphics



After completing this chapter, we will be able to –

- explain the concept of multimedia;
- describe the method of multimedia;
- identify the fields of using multimedia;
- explain the idea of presentation software;
- analyse the significance of presentation software;
- describe the technique of using presentation software;
- explain the idea of graphics;
- describe the technique of using graphics software;
- prepare slides on different topics by using presentation software and present them;
- draw creative pictures by using graphics software and present them.

Concept of Multimedia

Human beings have been using different media to express themselves since the ancient time. Writing is an expressive medium, and so are the sound and image. Multimedia is the integration of multiple forms of expressive media, such as texts, graphics, drawings, photographs, videos etc. With the evolution of civilisation and development in technology, these mediums have been used in

various ways. Specifically in today's digital era, the nature of these media has also changed.

The media of the analogue age are not the major media of the digital age. Rather the media of analogue age have changed in motive. Once, the media were used separately, but nowadays they are harmoniously combined together. The potentiality of multi-media has been enhanced with the integration of programming ability of digital machines. Hence, it is also called 'interactive multimedia' because of its multiple dimensions and different programming abilities. Interactive multimedia is widely known to people. In summary, multimedia means numerous media. Interactive media means the media with which the users can connect and interact.

Multimedia is the combination of different expressive media. We express ourselves by using, at least, three media which are colour, image and sound. These three media have various forms too. They appear before us either individually or collectively. Different kinds of media are known to us, such as paper publication, radio, television, video, cinema, video games, educative software, webpage, etc. We can call television, video, and cinema multimedia, but video games, educative software, and webpage are called interactive multimedia.

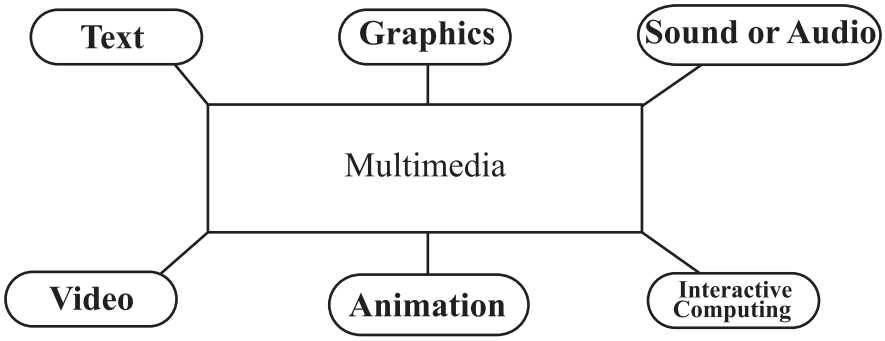
Multimedia is usually captured by a digital machine or device. It can be directly presented on the stage or projected in a different way. Sometimes some electronic devices are called multimedia because they contain the information and directly display it in different forms. If we want to use three media in one activity, we should start from the cinema. In the last phase of 19th century, in 1895, with the invention of cinema, text, graphics, sound and movement were added to it. Therefore, cinema is called the earlier invention of multimedia. Even though this form of multimedia came into being ages ago, the integration of the computer to it is a quite a recent development.

Media of Multimedia

We know that the computer, the most popular digital device, is widely known as the calculating machine. Processing and transferring data was another important work of the computer. Later on, it was widely used for typing.

In the beginning, only one medium was used to do all these works, i.e. text. However, gradually graphics and sound were used too. Besides, the computer has the ability to do programming. In fact, computers are capable of creating an interactive experience for users with the combination of text, graphics and sound. Now multimedia promised more dynamic experiences than that of the previous time. Multimedia is used not only in the computer, but also in mobile phones, smartphones, tablets, and other digital devices.

The main mediums of Multimedia



There is a world-wide preferences for computers and they tend to replace the conventional machines.

1. **Text:** Any work in relation to written text is done on computers world-wide. Once it was done by the typewriter. At present, computers are used for all kinds of writing tasks in offices and professional printing houses.
2. **Graphics:** Computers are used for graphics design, editing, and many other tasks. In our country, the use of computer is very limited in graphics design, painting, drawing, and even in commercial graphics included in Fine Arts. However, computers are widely used in printers and packaging industries. The use of computer in Bangladesh started in 1990s in printing, publication and graphics design. It was first used to edit scanned photos by Photoshop. Gradually, computers have been used in design and graphics.
3. **Video:** Video is a kind of graphics. It is better to call it a moving graphics. Video is an established medium all over the world. Video has been extensively used in TV, Home Video, Multimedia Software, Web, etc.
4. **Animation:** Animation is a kind of graphics. But it can be either moving or static. It can be either 2D or 3D. The use of animation is gradually increasing in our country. In advertisement, animation is a favourite media, but we lack skilled people in this sector. In fact, animation is never used as a single medium. It is combined with audio, video, text, graphics, etc.
5. **Sound or Audio:** The whole world depends on computer for sound or audio recordings, editing, etc. The analogue system has been completely rendered obsolete in sound engineering. Now sound recording can easily be done by computers.

6. **Interactive Computing:** In this connection, we should know a piece of information about interactivity. Application of any style, such as Microsoft word scroll or flash, into the text or any effects of animation into the video does not make the text or video interactive. Something created by the powerful authoring software like 'Flash', 'Director', and 'Authorware' that makes interaction possible between the user and the computer is called 'Interactivity'.

Use of Multimedia in ICT

There is an increased use of multimedia in ICT.

1. **As teaching aid :** The use of multimedia as a teaching aid is widely in vogue now. The learner will understand a topic easily, if multimedia is used in the class room. The teacher can easily make the lesson effective and interactive. Beside this, there are various kinds of multimedia software for education.

   1.1. **Multimedia Software :** The multi-media software has started being made in Bangladesh recently. Multimedia technology has been used in with 'Bangladesh-71', 'Abosor', 'Biswakosh', 'Namaj shiksha', 'Bijoy Shishu shiksha', etc. They are not much interactive. However, we expect that in Bangladesh, multimedia software will be definitely developed extensively in the 21st Century.

   1.2. **Digital Publication :** Our publication is still paper-based, but the 21st century will definitely be the century of digital publication.

2. **Entertainment :** Multimedia is widely used in most of the genres of entertainment. Cinemas and plays are being made livelier by the special effects of multimedia.

3. **Advertisement :** Because of the use of multimedia, advertisements have become attractive. Both real and fictional elements can be shown in advertisements with the help multimedia.

4. **Games :** Multimedia is extensively used in computer games or video games. Because of the use of multimedia, the games seem very realistic.

5. **Animation:** Animation is moving of static graphics or images. It can be two dimensional or three dimensional. The use of animation in advertising images is a favorite subject. Animation is never used as a stand-alone medium. Animation is usually created by combining audio, video, text, graphics etc.

The man who works with text, graphics, audio, video, animation, etc. is called the multimedia content developer. Many pieces of software like Adobe Photoshop, 3D Studio Max, Maya, etc. are used for multimedia contents. However, depending on the content that they develop and the interactive applications that they use, multimedia contents developers should be called

'multimedia programmers' or 'multimedia authors'. In fact, there is a difference between developing contents and adding interactivity. Adobe Premier and Adobe Photoshop can make an interesting piece of multimedia content. By contrast, in order to make the multimedia content interactive, 'Director', a programme for creating software, combines the media made in 'Premier' and 'Photoshop' and creates an interactive application.

In future, the demand and the number of multimedia programmes will definitely never lessen. The demand of multimedia content developers and programmers, along with business software developers and maintenance experts, is also increasing.

Presentation Software

Creating Presentation

It is the age of exchanging information and ensuring human welfare through free flow of information. Now, the exchanging of information among the researchers, educationists, social workers, and professionals of national and international levels has been emphasized most. Meetings, seminars, symposiums, and workshops are frequently arranged in order to ensure free access to information. As a result, experts have up-to-date information on their respective fields.

Presentation softwares such as PowerPoint, google slides, Impress etc. are mainly used to present information in an attractive and effective way in meetings, seminars, symposiums, and workshops. 'PowerPoint' is a piece of popular software or application of Microsoft Office. It is called 'Presentation Software' too.

Information can be presented attractively with texts, graphics, audio and video through PowerPoint. In fact, right at the moment there is no alternative to PowerPoint software. That is why it is widely used for presenting information in meetings, seminars, symposiums, and workshops.

Just as a word document in a Microsoft Word Programme has numerous pages, a PowerPoint presentation also has several slides. A page containing more than

one slides is called 'Handout'. A draft should be made for organized presentation in PowerPoint. This draft is called 'Slide Layout'.

Opening PowerPoint Programme and Creating Slides

To open PowerPoint Programme

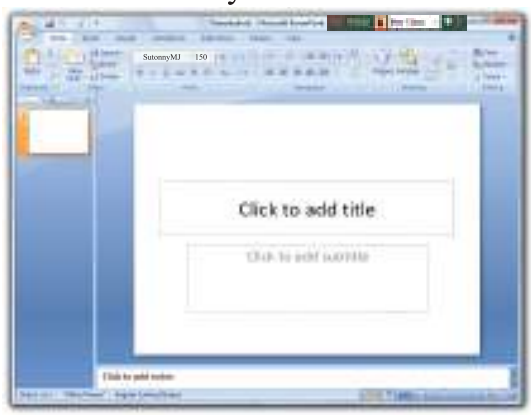
1. At the left corner below the screen, 'Start' is written. It is the 'Start' button.

   Click the 'Start' button by taking the mouse pointer on it, and a menu will be viewed on the screen.

   Place mouse pointer on the 'All Programs' command and get a 'Fly out' menu.

   Click the 'Microsoft Office' menu from this 'Fly out' menu and get the list of all the programmes of Microsoft Office on another 'Fly out' menu.

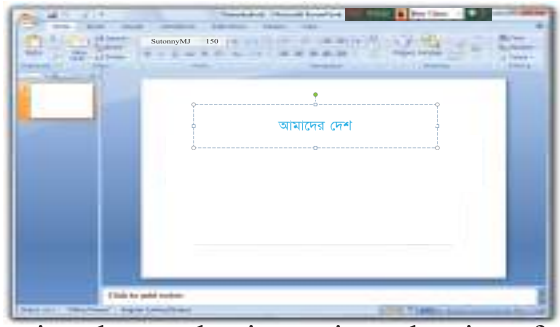
   Select the 'Microsoft Office Power Point' command from this list and the first slide will be shown on the screen. In the main part of the slide.



- 'Click to add title' and 'Click to add subtitle' are written on the box. Click both the them and a text box will be shown with the insertion pointer. Type a title and subtitle while the insertion pointer is in the box. If you click outside the box without writing anything those two writings will be viewed again.
- Click the textbox border and press delete button after selecting, the textbox with the writing will be deleted.

  Select the textbox icon from the ribbon of the 'Home' menu and take the insertion pointer inside the screen and the insertion pointer will be changed into a text pointer. (create a box, dragging)

- The insertion pointer will be on the box.
- The keyboard will be transformed into 'Bangla' for typing in Bangla.
- Select font, fontsize, colour, etc. from the toolbar and ribbon for typing work.



- 'আমাদের দেশ' is typed selecting Sutonny MJ, font size 150 and blue colour.
- The textbox will remain selected after being typed. There will be round and hollow selection points, four on the four arms of the selected box and four on the four corners. Dragging these selection points, the size of the box can be made small or big either sideways or from the top to the bottom to contain texts. The selection will go away if you click outside the box.
- The box can be moved to any place of the screen by clicking on any arm of the box and by dragging it.
- On the left side of the slide making window, the small version of the slide is shown in thumbnail view.

Saving Presentation

- Give the Save command from the file menu, and Save as dialogue box will come.
- Type the name of the file in Save as dialogue box. Suppose that the name is 'My Country.'
- Click the button 'Ok' in the dialogue box, and the presentation will be saved as 'My Country'.
- The file can be opened next time to complete the unfinished work.

Adding New Slide

Many slides may be included in a single presentation. To add a new slide

1. Select the command of 'New Slide' on the ribbon of the 'Home' menu or Press Ctrl+M on the keyboard. A new slide will be added.

- 'Click to add title' and 'Click to add text' will be shown on the newly added slide. Both the writings will be deleted following the previous directives. The small version of the newly added slide will be shown on the left side of the Window in thumbnail view.

2. Type the title of the new slide 'একুশ থেকে একাত্তর' in the textbox following the process described earlier.

3. Following the same process, type the three titles in three different boxes:



১৯৫২ সালের ২১ ফেব্রুয়ারি ভাষা আন্দোলনের ভেতর দিয়ে স্বাধীনতার আকাঙ্ক্ষা স্পষ্ট হয়ে ওঠে ১৯৭১ সালের ২৬ মার্চ আমাদের স্বাধীনতা দিবস। এ দিন থেকে মুক্তিযুদ্ধ শুরু হয়

১৯৭১ সালের ১৬ ডিসেম্বর আমাদের বিজয় দিবস। এ দিন মুক্তিযুদ্ধে বিজয় লাভের ভেতর দিয়ে আমাদের স্বাধীনতা অর্জিত হয়

- The three boxes will be placed one after another from top to bottom. The title will be on the top. Another slide will be added following the process of adding the second one. That will be the third slide.

4. Type 'ধন্যবাদ' as the title of the new slide in the textbox following the process described earlier.



- By adding numerous slides, complete the work of presentation as required.
- After preparing the primary presentation, adding different varieties make the entire presentation attractive.

Display Slides in Presentation

Making two slides for presentation, check it whether it is workable as well as presentable. For completing the task,

- Press the button F5 on the keyboard or select the Slide Show on the ribbon of the View menu or click the icon of Slide Show on the status bar, the first slide of the presentation will be displayed.
- For viewing the next slide of the presentation, press the right arrow of the keyboard, and to go back, press the left arrow.
- For starting the next slide show from the middle of the presentation, press Shift F5 button.
- Press the Esc button to revert to the window of editing from the window of slide show.

You can be sure whether the slides are presentable or not by checking at any phase of preparing the slides.

Changing the Background of Slides

The color of background can be changed either during the processing or after the making of the slides. Any image can be used as the background of the slide.

Adding or Changing Background of the Slide

1. Keep the slide open or active to add a background to it. The first slide of the current presentation is kept open.
2. If you click on the drop-down bar of Background Style on the right of the ribbon of the Design menu, a palette of gradient and solid color will come on the screen. If the mouse pointer is placed on a color or gradient of the palette, in the original slide, the background of that color or gradient will appear.



To use more colors, textures and images

1. Select Format Background at the bottom, and a dialogue box of that name will come on the screen.
2. Clicking the Solid Fill Radio button on the left above the Format Background dialogue box, make it active. Click Color Drop-Down Arrow, and a color palette will be viewed on the screen. The color swatch, which will be clicked from this palette, will fill the background of the slide.
3. Clicking radio button of Picture or Texture Fill, make it active, and Texture drop-down will be viewed instead of color. Click this drop-down arrow, and different kinds of texture will be shown. The texture swatch, which will be clicked, should be selected from the original slide.
4. The dialogue box called Insert Picture will come if the File button below Insert Box is clicked as the radio button of Picture or Texture Fill is selected. Select the picture opening the folder of the dialogue box that contains the picture.

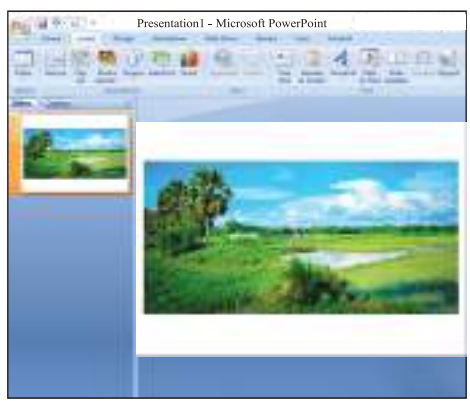
5. Click the Insert Box button of the dialogue box, and it will disappear, and the picture will be set as the background of the slide.
6. To remove the imposed background –

   Click the Solid Fill radio button of the dialogue box of Format Background and make it active. Click the drop-down arrow of Color, the palette will be viewed on the screen. Select White from this color palette.
7. Click the Close button of the dialogue box.

Insert Picture in Slide

Sometimes, it may require to insert a picture on the slide.

To insert a picture into a slide



1. Click the icon of Picture on the ribbon of the Insert menu, and the dialogue box of Insert Picture will come on the screen.
2. Open the folder of the dialogue box of Insert Picture in which names of pictures are available. After selecting the picture you prefer, click the Insert button. The selected picture will be added to the slide.
3. Clicking the resize box and dragging it, the size of the picture can be resized and replaced elsewhere, if required.

Inserting Transition into Slide

Usually slides are presented one after another, and effects are used to shift from one slide to another. This effect is called 'Transition'. It works on the slide into which transition is applied by keeping it open. To insert Transition into a slide

1. Keep the first slide open.
2. Click the Animations menu to activate it.



On the ribbon of Animations menu, a row of Transition samples will be viewed.

The sample on which the mouse pointer is placed will be viewed in the slide. There are three arrows on the right to pick more from the given samples. If you click repeatedly on the middle arrow, a new row will be viewed with every press of the mouse button. If you click the arrow on the top, a column will appear. If you click the arrow at the bottom, all the samples will be viewed. Click the sample chosen, and the transition will be applied to the slide.

3. If you want to apply the same transition to all the slides, click 'Apply to All' button on the right side after applying it to the first slide.
4. If you want to apply a different transition to every slide, you have to apply it separately following the same process for every slide.

Applying Transition Separately in Text

One slide may contain several textboxes. There are texts in three textboxes in the second slide of the current presentation. If different transitions are applied in these three textboxes, they will come to slide in three different processes. To insert transition to the textbox

1. Keep the second slide open.
2. Select the textbox.
3. Click the Animations menu to activate it.

   A command called Custom Animation will be added to the bottom of Animation. Click Custom Animation and a palette will come.
4. Select Entrance from the Add Effect drop-down list of Custom Animation, and a list of custom transition will appear. From this list

- 'Blinds' is selected for the first textbox.
- 'Fly in' is selected for the second textbox.
- 'Diamond' is selected for the third textbox.
- If you select 'More Effects' from this list, another list of transition will be viewed. Selection of any transition from this list will show the same effect.

5. In order to remove a transition from a specific textbox, select it. Click the 'Remove' button to exclude the transition.

Apply Sound to Transition

Keep the slide open to add sound to the transition, and select the name of a sound from the drop-down list of Transition Sound. Camera is selected for the first slide. Click Apply to All button for applying the same sound to all the slides.

If different sound is required to apply in every slide, separate application of sound following the same process for every slide will be needed.

Add Video to the Slide

Video can be added to any slide, if necessary. Usually video is added to the introductory slide. Suppose that video will be added to the introductory slide of the presentation on Our Country. For this

- Keep the introductory slide of the presentation open.
- Clicking the Movie drop-down on the ribbon of the Insert menu, get 'Movie from the file' command. Select the command and 'Insert Movie dialogue box' will come.
- A movie file will be selected from the video folder of the Insert Movie dialogue box.
- Click the Ok button of the dialogue box.
- A message box with a question 'How do you want the movie to start in the slide show?' will appear.
- The Messaging box will contain two buttons 'Automatically' and 'When Clicked.'
- The Messaging box will disappear if required button is pressed, and the video file will be added to the slide. You can place the file anywhere on the slide by dragging it and resize it by dragging the resize box.
- The first slide will appear on the screen if you press F5 on the keyboard.
- The Thumbnail view of the video file will be shown on the screen.
- Click the Thumbnail of the video file and it will start playing. If 'Automatically' was selected at the time of adding the file, it will start playing with the display of the slide.

Activity

Make a power point presentation about your school and present it.

Graphics

Importance of Graphics

Photographs, drawings, paintings, illustrations, designs, etc. have to be scanned and transferred to the computer first for editing. Now pictures captured by a digital camera can directly be copied to the computer. After editing, these photos can be used on printed invitation cards, posters, banners, advertisements, etc. through the digital media.

There are numerous programmes to edit photos in computer. Of these programmes, Photoshop is popular worldwide. Brightening or darkening the entire or a part of picture, designing the cover of a book with several pictures, making posters, cutting off any irrelevant part of the picture, erasing blotchy marks on the picture, etc. can easily be done by Photoshop.

Photoshop, should have been installed in the computer or it should be installed before starting editing with it. Editing can be done on a file created earlier.

To open Photoshop program

1. Click the start or Logo button of Windows and place the mouse pointer on the 'All Programs' command, and get the Fly out menu.
2. Click Adobe Photoshop Programs, from this menu and 'Adobe Photoshop' will open.

To prepare new file in Photoshop program

- Click 'New' from the 'File' menu after opening up the Photoshop program, and get 'New' dialogue box.
- You will get 'Untitled-1' selected in the square space of 'Name' of the dialogue box. Pressing the backspace button of the keyboard, erase the writing and type a name. It will be the name of the file. Suppose that 'Practice' is typed in the 'Name' box.

  If you type the name in this stage, you need not type it further. While closing the file, a new dialogue box will come when you will go to close the file.
- In the box of 'Width' and 'Height' in New Dialogue Box, type numbers on the measuring unit 'inch', for example, width of 7 inches and height of 8 inches. There is a dropdown menu to determine the unit of measurement on the right side of these two boxes such as inches, pixels, piacas, points, cm,

mm. Select the requisite unit from this dropdown menu. Fix the measurement by inches. Suppose that the measuring unit of the present task is inch, and 7 in the box of width and 8 in the box of height have been typed.

- The Resolution, for example, 72 Pixel, is kept unchanged.

Images or pictures are created in Photoshop by pixels. Pixel is the smallest square unit of image. 72 pixels per inch mean crossing 72 lines vertically and horizontally in per inch space. The total number of pixels in one square inch will be 72´72= 5184. The number of pixels in per square inch is called resolution. If 130 is typed in the box of pixel, the resolution will be 130´130=16900. If an image is enlarged, the pixels could be visible. This view is called pixelated. In simple words, it is called split image.

- From the dropdown menu of color mode in the dialogue box, RGB, CMYK, Bitmap, Grayscale, and from Lab Color RGB can be selected as all the images on the monitors of computer, television, and other electronic media are viewed in RGB mode. RGB is the abbreviation of red, green and blue.
- There are three options in the 'Background Contents' of the dialogue box. The options are White, Background and Transparent.
- If 'White' is selected from the dropdown menu, the background will be white. If a colour is selected from Background toolbox, it will turn into the colour of the canvas. If transparent is selected, the background will be transparent and checkered. The background option can be selected as you like. White can be selected here too.
- Without following the steps described above, Default Photoshop Size can be selected from the 'Preset dropdown list. Thus, all the units of Photoshop will be selected as per the requisition.
- Completing the measurement of the dialogue box, press 'OK'.
- A window will be viewed as per the measurement given in the dialogue box. On the left of the screen, Practice @ 100% (RGB/8) will be viewed. This bar is called the title bar. If any name is not used in the Name box of the new dialogue box, Untitled-1@ 100% (RGB/8) will be viewed on the title bar as the file name.

- Double click on the title bar, and it will be viewed on the screen.
- The menu bar is located under the title bar and the option bar is below the menu bar.
- The ruler is located below the option bar.
- The Photoshop work is to be done below the ruler on the screen.

The screen can be compared to the canvas of painting of an artist. On the left side of the canvas, are the brush, color, and different kinds of editing tools, and on the right side is the palette



The Toolbox of Photoshop and Palette

At least 69 kinds of tools are there in the Photoshop. Besides, numerous options of palettes, dialogue boxes, etc. are there. There is a relationship among different tools, option palettes, and dialogue boxes.

In addition, the brush colour or foreground and colour control icon are there for the canvas or background and visual space control icon for the monitor, mask icon, etc. If a line is drawn either with the pencil or with the brush tool, the color of foreground works as the color of brush.

- Different palettes are kept on the right side of the screen. The minimise icon is viewed above the right side of the palette. The palette will be minimised if you click the minimise icon. It will be again extended if you click the maximise icon.
- If you double click on the top bar of the palette, it will be either maximised or minimised.
- Clicking and dragging the top bar, the palette can be replaced anywhere.
- There is a toolbox on the left side of the screen. It includes different kinds of tools for different jobs. The tool, which is required to work, becomes activated when clicked. If the mouse pointer is taken inside the screen after selecting a tool of the box, the tool is either viewed on its actual size or as a plus (+) sign, and the editing tools are viewed as circles.



Introduction to Selection Tool and Move Tool

- 3 selection tools and 1 move tool are viewed on the top of the tool box. At the bottom of the right side of some tools, a small arrow sign Z is viewed. It indicates that in the same position, more tools of the similar types remain there. For example, 4 Marquee tools in the same position and 3 Lasso tools in different positions are there.
- Place the mouse pointer on the tool, and the name of the tool will be viewed. Click the tool to activate it. If the mouse pointer is brought inside the screen, it will be viewed either in the own shape of the selected tool or with a plus (+) sign.
- Making squares, circles and objects is possible with the marquee tool within the selected tool.
- By pressing the shift button and dragging Rectangular Marquee Tool, a perfect square, and pressing the shift button and dragging Elliptical Marquee Tool, a perfect circle can be drawn. If you drag while pressing the Alt button, selections of square and circle can be extended from the centre point.

Shifting of Selection

- After making the square of selection by Rectangular Marquee Tool, remove the finger from the mouse, and the selection of square will be viewed on the screen.
- If you take the mouse pointer inside the selection, a rectangular icon will be viewed below the pointer. Pressing and dragging, the selection can be shifted elsewhere.
- Select the 'Deselect' command from the Select menu or click the mouse pointer outside the selection while it is floating. It will go away.

Fill Colour in the Floating Selection



- There are colour icons of ‘Foreground’ and ‘Background’ at the bottom of the toolbox. The icon above is for ‘Foreground’ and the icon below is for the ‘Background’. To fill a selection with colour while floating:
- Press Alt+backspace, and the selection will be filled with the colour of the brush or

Foreground. If you press Ctrl+backspace or only backspace, it will be filled with the colour of the Background or the canvas.

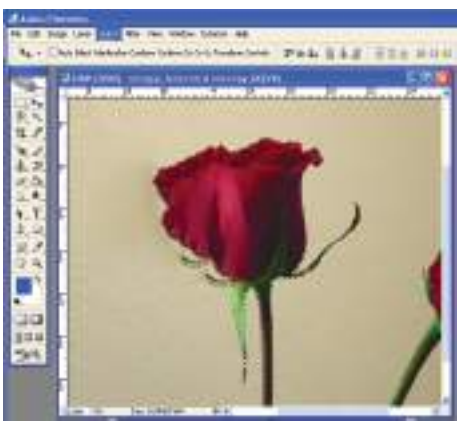
- The selection filled with colour will float. It can be shifted elsewhere by dragging.
- The object will stay at the same position after shifting the selection.
- If the shifting is done by pressing the Ctrl button, the object being shifted will be cut.
- Press Ctrl and Alt during shifting, and the object being shifted will be copied.
- The selection will go away if you click the mouse pointer outside the selection.

The Use of Feather

- Typing the number from 0-250 in the box of feather on the option bar, the edge of the object can be softened. The room of the feather extends equally from the edge of the object to the inside and outside.

- The feather effect will be activated by pressing enter button after writing different numerical figures in the box. Fill colour by using either the rectangular marquee tool or the elliptical marquee tool, and the effect of feather will be visible then. The effect will be still viewed after pasting the cut or copied object.

Select with Lasso Tool and Polygonal Lasso Tool



- Select the lasso tool in the toolbox. Numerous selections can be made with lasso tool such as
- Clicking and dragging on the canvas after selecting the lasso tool, selections of a non-circular and uneven edges can be made. If you release the finger from the pressing position on the mouse while dragging, a closed selection will be created from that position to the first clicking point.
- By clicking inside the selection while floating, it can be shifted elsewhere by

dragging. Filling any floating selection with colour, it can be filled either with the same or a different colour.

- Opacity is used to determine the thickness of colour.
- The 'Fill' dialogue box will come after giving the 'Fill' command under the 'Edit' Menu.
- The foreground is kept selected in the ‘Use’ box of ‘Contents’ under the ‘Fill’ dialogue box. It can be changed from the list of the dropdown menu, if required.
- In the opacity square of the dialogue box, type a number to determine the thickness of colour. The full intensity of colour is 100%. If the percentage is small, the colour will be light. Type 50 in the Opacity box, and click the OK button, and the foreground of the selection will be filled with 50% of the total thickness.
- There is opacity in the option palette of selection too. The intensity of colour can be increased or reduced by selecting the opacity of this palette.

Stroke

- The border of the selection can be made with the ‘Stroke’ command.
- Select the ‘Stroke’ command under the 'Edit' menu as the selection is floating, and you will get the 'Stroke' dialogue box.
- Any number from 1-16 can be typed in ‘Stroke Width Box’. The extension of the border is determined with this number. To create the border outside, inside or at the middle of the selection, activate any of these three options by clicking the radio button attached with them.
- Click the ‘Ok’ button of the dialogue box.
- Borders can be created either by using the colour of the brush or of the foreground in the Stroke process.

Saving File

- Give the ‘Save’ command from the ‘File’ menu, and the ‘Save As’ dialogue box will be viewed.
- In the box of ‘File Name’ of the 'Save As' dialogue box, type the name of the file, for example, 'Practice'.
- Click the ‘Ok’ button in the dialogue box, and the file will be saved as ‘Practice’.
- ‘Practice’ can be opened for further work later.

Layer

An idea of Layer is required before creating objects or editing photos. Almost at every stage of editing photos, you have to work through Layer.

Layer is the screen of editing photos or the phases of a canvas. In this process, editing can be done by putting numerous transparent canvases one after another. If the canvas is transparent, editing becomes easier as the existing photos can be watched, but if the canvas of the upper layer is not transparent, the editing of the lower layer cannot be seen. If any photo with colour background is opened, 'Background' will be written on the layer palette. The background will not be transparent in spite of being white because white is a colour.

- Suppose that a file with the picture of a flower is opened. 'Background' is written on the layer palette. An icon of a lock is viewed to the right of the layer bar. It indicates that the layer has been locked. The object of a locked layer cannot be shifted by clicking or dragging with the 'Move' tool.



- If 'White' is kept as 'Background Content' and 'Background' while opening a new file, 'Background' will be viewed on the layer palette.
- 'Background' can be transformed into a layer to shift the sample picture of the flower elsewhere.

To accomplish the task



- Double click on 'Background' of the layer palette, and a dialogue box named 'New Layer' will be shown. In the 'Name' box 'Layer 0' will be viewed. Click the OK button of the dialogue box, it will disappear, and the 'Background' layer will be transformed to 'Layer 0'. The 'Background' layer will be 'Layer 1' if it is written after erasing 'Layer 0' in the 'Name' box of the dialogue box.

- If you click on any part of the picture with the 'Background Eraser' tool, that part will be erased, and the layer of the palette will automatically be transformed into 'Layer 0'.
- If any part of the picture is erased by the Eraser tool, the layer will not be transformed into 'Layer 0'.

Insert New Layer

Many layers should be used to work with more than one file in Photoshop. By keeping different pictures on different layers, their arrangement and editing should be done.

To add new layers in palette

- Click the 'Create a New Layer' icon below the palette, a new layer will be added above the existing or selected layer. This layer will be a transparent one. To create any new object in the newly added layer, shift it elsewhere if required. If five layers are created in this way, layer no. 2 will be above layer no. 1, no. 3 will be above no. 2, no.4 will be above no. 3. If more layers are added, those will be arranged serially.
- The arrangement of steps can be changed if required clicking layer no.2 and pressing on the mouse, drag it and release on layer no. 3, and it will be placed in between layer no. 3 and 4. After the selection of dividing line between two layers, release the pressure on the mouse.

You should remember that 'Background Layer' can not be shifted in this way. Background should be transformed into layer to replace it into another stage.

Make Picture Visible and Invisible on Layers

There is the icon of an eye on the extreme left of every layer. This icon is called 'Layer Visibility Icon'. Click on the icon of eye, it will disappear along with the picture on the screen. Click again on the empty place of the eye, and the icon will be visible again, and the picture on that layer will be visible again. The picture of the flower on the layer can be made visible and invisible for experimentation.

Thumbnail Icon

There is a thumbnail icon on the right side of the icon of eye. The meaning of thumbnail means the miniature version of a large picture. This miniature version on the layer along with the picture on the screen is viewed in the thumbnail icon. It facilitates the editing of the pictures on particular layers.

Clustering, Integrating and Segregating Palette

Numerous palettes can be panelled together. For example, Layer, Path and Channel can stay together. The names of the palette will remain as tabs. The tab which is clicked will be activated. The combined situation of several palettes is called clustered palette.

- The present palette is activated as a 'Layer Palette'. Click the layer tab and drag it outside the palette to release. The Layer palette will exist as an individual or single palette.
- Again clicking the tab of the individual Layer, release another palette inside by dragging it. Thick lines around the palette will be viewed. Thus the Layer taken by dragging will be included in the cluster.
- If the 'Layer' palette is not viewed on the screen, select the 'Layers' command from the 'Window' menu, and you will get the 'Layer' palette.

Making Layer Object

The process of making Selection and filling it with colour has been learnt. Now we will learn how to make two simple objects with rectangular and circular selection tools. We will learn how to write using the text tool too.

A. Creating a rectangular object on Layer no. 1:

- Select White from the option of Background Contents of New dialogue box, and Background will be the base of the Layer palette. For making a transparent layer on a white background:
- Click on the icon of Create a New Layer below the palette, and a new Layer will be added above the selected layer. This will be Layer no. 1, and it will be transparent too.
- A rectangular selection will be created on Layer 1 with the Rectangular Marquee Tool, and that will be filled with green colour.
- The rectangular object can be shifted elsewhere by the Move tool.

B. Insert Layer no. 2 in the panel, and make a circular object:

- Click on Layer no. 1, and it will be selected.
- Click the icon of 'Create a new layer' below the palette, and it will be a transparent layer.

Or

- If the New Layer command is selected from the dropdown menu of the layer palette, the New Layer dialogue box will be viewed. In the square space of the Name of the dialogue box, Layer 2 will be viewed. Type Circle in the Name box and press the Ok button, and the dialogue box will disappear. A new layer named Circle will be inserted above layer no.1 in the layer palette.
- Now create a circular selection with the Circular Marquee Tool so that half of the circle will rest on the green field and the other half on the white.
- The selection will be filled with red colour, and a red circle will be viewed in thumbnail of Layer circle.

C. Preparing Text Layer

- You should keep in mind that if text is started with the Type tool, the text will automatically be written on the Text layer. The new text layer will be transparent.



To write on Text Layer:

- Click on the canvas selecting the Type tool from the toolbox, and instantly a new layer will be added to the Layer Palette.
- Selecting the Text tool, click the mouse pointer on the canvas, and the requisite dropdown option list will be found on the Option bar to determine the font, font size, etc.
- Select SutonnyMJ from the dropdown list of fonts.
- The size of the font will initially be selected 72 from the dropdown list of font.
- The font colour will be initially black.
- Type 'সোনার বাংলা', and it will added as a new layer. The letter 'T' will be viewed as a thumbnail of the text layer on layer palette.
- The text can be shifted elsewhere with the Move tool or the mouse pointer.
- Now the square, circle, and text can be shifted anywhere with the Move tool.

- If the combined position of the three objects is satisfactory, the file can be saved for further use.

Transferring Picture from One File to Another

All the pictures should be transferred to a single file to work together. Prepare an empty file named Default Photoshop Size. Another file called Banana is opened with the pictures of bananas. Now clicking on a banana with the Move tool, and drag it to the Window of the empty file. The picture of the banana will be shifted to the empty file. Close the file of Banana.



In the same way, more pictures of mangoes, pineapples, etc. can be prepared and shifted to the new file.

Fixing Target Layer

- The layer in which the picture is edited is called Target Layer.
- Any picture of any layer can be edited whenever required. The picture of a single layer can be edited once.

To change a layer into Target Layer:

- Click the mouse pointer on the layer, and the layer will be changed into the Target Layer. The Layer will be viewed and selected then.

Changing the Opacity of the Layer

- Opacity is the intensity of colour. In the opacity text box on the right side above the Layer palette, 100% is viewed as the full intensity of colour. If you put mouse pointer on Opacity, it will be transformed into a two-pointing arrow. When it will be dragged to the left, the opacity will decrease, and when it will be dragged to the right, the opacity will increase.
- Or by typing a numerical figure in the opacity textbook the opacity can be changed.

Removing Layer

Select the Layer to be removed. Then

- Give the Delete Layer command from the pop-up menu of the Layer palette.

Or

- After selecting the Layer, click the icon of Delete Layer below the palette, and a dialogue box with a question, 'Are you sure you want to remove this Layer?' will come. If you click the 'Yes' button, the layer will be removed, but if you click 'No', the removal process will be stopped.

Combining or Merging Layers

Sometimes it is required to edit all the layers together in Photoshop. After finishing the task, if it is required to take a print out by a different printing machine, it should be copied on CD or pen-drive. The size of the file will be small for getting this task done smoothly. The size of the file will be comparatively small if the layers can be combined.

To combine layers

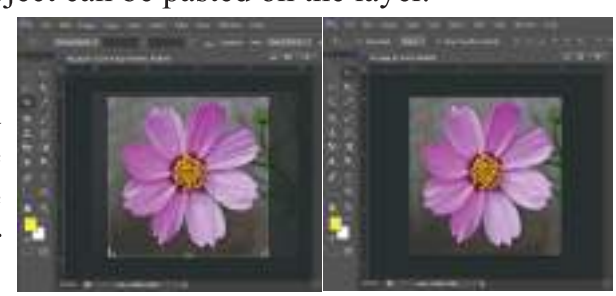
- There are three commands called Merge Visible, Flatten Image, and Merge Down on the pop-up of the Layers palette.
- If any layer is invisible, give the command of Merge Visible, and only the visible layers will be combined.
- If the Merge Down command is given, the selected layer and the layer below of it will be combined.
- If you choose Flatten Image, all the layers will be combined.
- If there is any invisible layer, an inquiring message will come whether it will be removed or not. Click the Yes button, and the invisible layers will be removed and the visible layers will be merged.

Cut, Copy, Paste and Paste into

You may select any object or image either fully or partially, and cut, copy and paste it. If you paste any object after cutting or copying, a new layer is created, and the object is pasted on the new layer. If any transparent layer is created before pasting, any cut or copied object can be pasted on the layer.

The Use of Crop Tool

The border of pictures collected from different sources may not be perfect or precise. It can be required to cut off the edges or



unnecessary parts. Again, the image may have to be tilted to one side.

Before starting editing, this kind of problem can be solved. The Crop tool is used to cut off the unnecessary parts of an image. Crop means cutting off.

- The border of this old picture is uneven, and the first step of editing the picture will be cropping out the uneven edges. To get it done:
- Select the Crop tool from the toolbox;
- Select the necessary part keeping the uneven parts outside by clicking and dragging it like the rectangular marquee tool.
- Eight hollow square boxes will be viewed, four on the arms of the selection and four on the corners. By clicking any one the boxes and dragging it, the area of the selection can be either reduced or increased.
- After fixing the selection area, press the enter button of the keyboard, and the area outside the selection will be cropped.
- If you think that the crop command should not be given even after selecting, press the Esc button to undo the effect. Selection can be made again if required.

Cropping up Tilted Picture

- To crop any tilted picture, the picture is to be opened and the Crop and Straightened Photo command is to be selected from the sub-menu of Automate command in File menu. This process is applicable only for solid background. If the background is of multicolor, the work of cropping will be impossible. In that case -
- Select with the crop tool.
- The mouse pointer will be transformed into a curved pointer or rotate tool. The selection will be attached with the tilted position of the picture, and the area of cropping will be finalized with other handles.
- Press the Enter button, and the cropping up of the picture will be done, and its positioning will be straight.

Use of Eraser Tool

- When any color is erased by the eraser tool, the color is covered with the color of the canvas. If the color of the canvas is white, it seems that the color

is being erased, but if the color is different, it will be viewed. The picture on transparent layer will be simply erased.

- Press Cap Lock to erase the minute detail, and the eraser tool will take the shape of plus (+) sign. The editing of small parts will be done then.
- The work of erasing can be done by selecting a brush, pencil, or block from the list of Mode drop-down of the Option bar on eraser tool. The rubber eraser works like an electronic version if a block is selected. The Opacity options of other tools can be used if they have been selected.

Creating Blend with Gradient Tool

The paint Bucket Tool is kept on the same position of the Gradient Tool. If you select the Gradient tool, icons of creating five kinds of gradient will be viewed on the Option bar, for example, Linear Gradient, Radial Gradient, Angle Gradient, Reflected Gradient and Diamond Gradient.



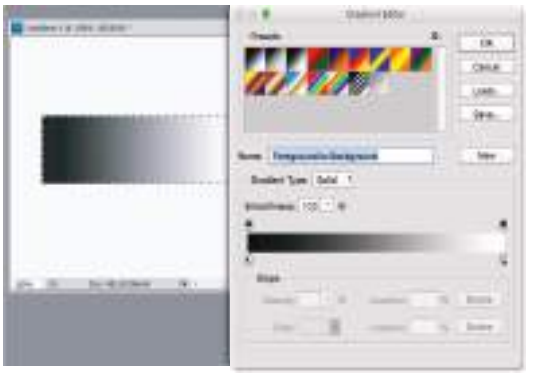
Blurring of a color from the beginning to the end is called blend. The color blurs from the beginning edge to another in linear blend. On the contrary, in radial blend, the color diffuses either from the centre to the periphery or the periphery to the centre.

To create linear blend with gradient tool

- Create a selection of 3 inches width and 2 inches height.
- After selecting the gradient tool, bring the mouse on the canvas, and it will be transformed into a plus (+) sign. Now drag it from the left-middle of the selection to the other end, and release the pressure of the finger from the mouse pointer. It will be viewed that the selection starting with deep black color gradually diffuses to the end.
- A blend can be created from all directions. If anything is not selected, blend will be created throughout the screen.
- Activate the radial gradient icon on the option bar by clicking it for creating radial gradient.
- The mouse after bringing onto the screen will be transformed into a plus (+) sign. Now drag it from the middle of the selection to the other end, and release the pressure of the finger from the mouse pointer.

Editing Gradient

- The editing of gradient can be done by starting, finishing, and changing or combining colors in the dialogue box. To get the task done-
- Gradient Editor Dialogue box can be viewed by clicking on the gradient bar.
- Color Stop triangles can be viewed on the left and the right end of the gradient slider of the gradient editor dialogue box, and the Opacity Stop triangles are found on the top of the same dialogue box. Suppose that the starting color of a linear gradient is red and the finishing touch is yellow. To use blue instead of red-



- Click the Color Stop Triangle at the left end of the gradient slider, and a color swatch will be activated at the end. Click the Color swatch and the Select Stop Color dialogue box will be viewed. Selecting the blue color in this dialogue box, click the Ok button, and blue will be the Stop Color at the left-end on the gradient bar. Now drag with gradient tool from one end to another, and a gradient of a combination blue and yellow will be created.
- If you select the Color Stop at the bottom edge and Opacity Stop on the top edge of gradient slider, a diamond shaped icon will be viewed in the middle. This icon indicates the middle point of the gradient from where the color starts diffusing.

  After selecting the middle-point icon, type a position-fixing digit in the location box to fix the middle. The middle point can be shifted by dragging the icon either to the left or to the right.

Adding and Removing New Color and Color Stops

If more than two colors are to be used for a gradient, add new Color Stops to the slider. To do this -

- Click anywhere at the bottom of the slider, and new Color Stop will be added to the diamond for determining color blending middle point. In the same way, requisite number of Color Stops can be added to the gradient slider.
- If any additional Color Stop is needed to be removed or cropped, click that color stop icon and drag it to the outside of the slider, and the Color Stop will be removed.

Adjusting Brightness and Contrast of Picture



Pictures that have been scanned or captured by a camera can be indistinct. Visibility of color or black and white may not satisfy the expectation level. In that case, increasing the brightness and combining contrast are required. To increase the brightness and contrast -

- Select the Adjustment command from the Image menu and get a submenu from where click Brightness/Contrast, and the related dialogue box will be viewed.
- By moving the triangle of brightness/contrast-slider in the dialogue box either to the right or to the left, the brightness and contrast can be increased or reduced.
- If any part of the picture is selected before coming of the dialogue box, increasing or reducing brightness and contrasting only the selected part can be done by giving the command.

Activate the Preview check box in the dialogue box by clicking it, and the work of the changing color can be viewed instantly. If the changed form does not seem satisfactory, press the Alt button of the keyboard and the Cancel button of the dialogue box will be changed into a Reset button. Keep pressing the Alt button and click the Reset button, and the work previously done will be cancelled.

Illustrator

Painting with Adobe Illustrator: Adobe Illustrator is the programme of drawing pictures, illustrations, making logos and designs. Just as the scope of making designs with Adobe Photoshop is limited, so is the scope of photo doing editing work in Adobe Illustrator. The main job of Illustrator is drawing.

Now, the artists of our country no longer use paint and brush for cover designing of books. They design covers by using Adobe Illustrator. Invitation cards, advertisements, posters, banners, bill-boards, etc. are made now with illustrator.

There are plenty of programmes in a computer for making designs, but the Illustrator is popular for its facilities and varieties. That is why Illustrator is used throughout the world.

Apart from writing in the Illustrator programme by using a keyboard, writing is possible as an artist does by using brush. The font size and shape can be changed as required.

Like other programmes, open Illustrator and start making new files.

Open Illustrator Programme

To open Illustrator programme

1. A menu will be viewed when you will click on the Start button at the left end of the screen with the mouse pointer.
2. You will get a fly out menu placing the mouse pointer on All Programmes in this menu.
3. By clicking Adobe Master Collection menu in this menu, you will get another fly out menu. You will get the list of programmes of Adobe in this menu.
4. If you click on Adobe Illustrator from the list, the programme will open.

To Open File in Illustrator

- Select the New command from the File menu or press Ctrl N, and a New dialogue box will be viewed. In the New dialogue box -
- Type a name in the Name dialogue box, for example, Ankon-1. Any name can be used instead of this one. A name which is easy to remember or compatible with the subject can be given. Finding out the file will be easier later on.



- A detailed drop-down list will be viewed by clicking the drop-down arrow of the size-box. Different sizes of the paper will be viewed here. The size of paper which is required should be selected by name, and the height and width of the paper will be seen in the box.
- The units of measurement are found in Units box. The users of our country are familiar with the measurement of inches, but points, picas, millimetres, centimetres, pixel, etc. can be used to work more precisely. Click the drop-down arrow in the unit box, and a detailed drop-down list will be visible. The requisite unit of measurement can be fixed from this list.
- Pictures of two people are viewed on the right of Orientation. If you click

the first one, the position of paper will be portrait, and it will be in landscape position if the second one is clicked.

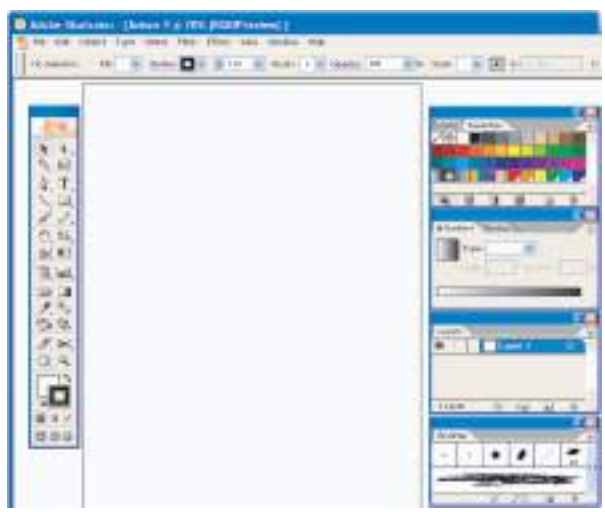
- Two options are shown as RGB and CMYK in Color Mode. CMYK mode is suitable for printing work, but RGB mode is better for electronic medium. However, on the computer screen, the difference of these modes are not precisely distinguished.
- Fixing the measurement, press OK in the dialogue box, and it will disappear. A new window will come.

In the Name box of the New dialogue box, type a file name, and it will be viewed on the title bar at the right side of Adobe Illustrator above the menu bar. If any file name is not typed 'Untitled ...' will be viewed on the title bar.

Work Tools

A new vacant file will be found on the screen after creating a new file. Numerous objects like menu bar, toolbox, floating palette, scroll bar, etc. will be viewed for starting work.

Title Bar



After opening the Illustrator Programme, on the left-end above the screen, other information of the document with the name of application on the title bar may be viewed, for example, Adobe Illustrator-[Ankon-1 @ 70 (RGB/Preview)]. Here, Adobe Illustrator is the name of application, Ankon-1 is the name of file if this name was given during its creation, and @ 70 (CMYK/Preview) is the size of visible area and presentation of color mode. The entire part stretching to the right is the title bar.

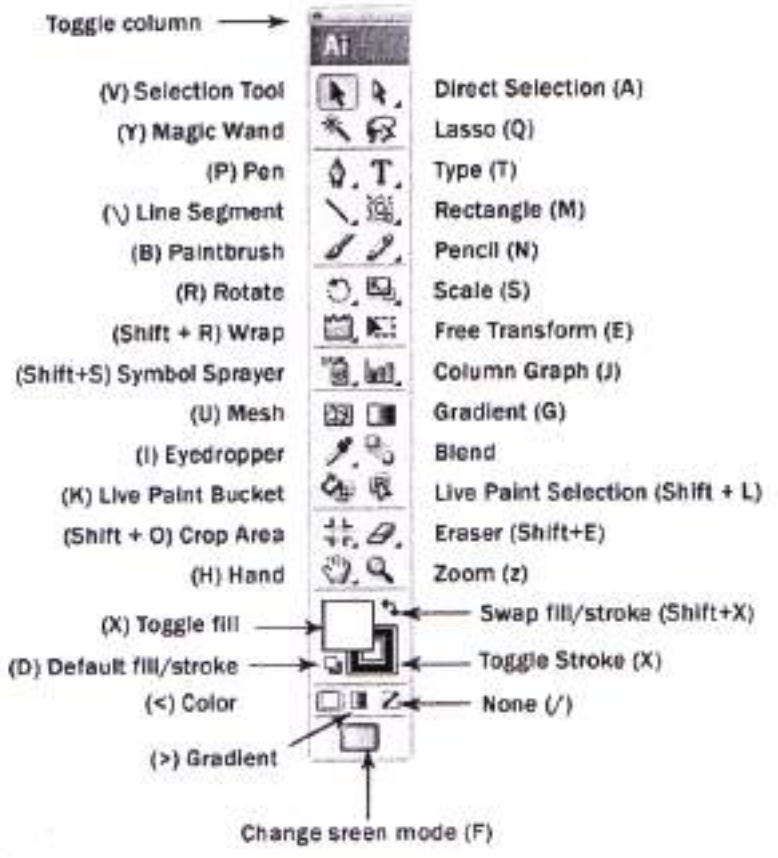
- If any name is not given during opening a file, it can be given after completing and saving the work too. Files are given different names, and when a file is opened, its name is viewed on the title bar to the right of the application.

Different kinds of tools and options for designing and drawing are arranged in Toolbox & Palette. Designing and drawing can be done by using these tools and options, and editing work is possible to get the image in its expected form.

Names of the Necessary Tools of the Toolbox

Names of the necessary tools should be known before starting work. Ellipse, polygon, star, and spiral tools stay on the linear position in the toolbox. These are called 'Group Tools'. A Right-angeled triangle is attached with these tools. If a triangle sign is attached with the tool, it means that more tools are kept in the same position. If you click the visible tool in the box and continue pressing the mouse, all the tools will be viewed together. Drag the mouse pointer on the required tool and click, and the tool will be visible in the toolbox.

There are some icons in the swatch below the tools in the toolbox. Imposing color in an object or on the edges of an object or cancelling a command can be done with these icons. Create an object to understand the use of the icons. To make an object like this–



- Click the rectangle tool with the mouse pointer, and the tool will be selected.
- Bringing the mouse pointer inside the screen, and after clicking elsewhere drag diagonally right below for an inch, and release the finger pressure from the mouse. A rectangle or square object will be created.
- The object will be selected and filled with a color.
- Four hollow boxes will be viewed on the four corners of the selected object. Four small solid boxes will be viewed on the four corners.
- If the object becomes free from the selection, click Direct Selection Tool in the toolbox with the mouse pointer, and the Direct Selection Tool will be selected. Now bringing the mouse pointer inside the screen, click the object with Direct Selection Tool, and the object will be selected. In this situation, again click the Selection Tool, and four solid boxes can be viewed on the arms along with four solid boxes on the corners.

Filling Color on Object

Fill and Stroke



- The edge or border of an object is called 'Stroke' and the internal part is called the 'Fill'. The use of the 'Fill' and 'Stroke' swatch is related to the color palette. If the color palette is not viewed on the screen, either give the Color command from window menu or press the F6 button, and the color palette will be visible. Click the Fill swatch and it will be activated and viewed above. Thus only the work of filling can be done. Only an object can be filled, not the stroke. Similarly, clicking the Stroke swatch, activate it and stay over the Fill swatch. Thus, color can be imposed on the strokes of object. It will be impossible to fill object with color from here.
- When the Fill swatch is active, click on the colour of Color Spectrum Bar of the color palette. The inside of the selected object will be filled with that color. Similarly, when the stroke swatch is active the strokes of the objects will be filled with that color which is clicked on the Colour Spectrum Bar. The color inside the object will remain unchanged.

- Stokes can be thick for a clear view. For having this effect, select the stroke command from the Window menu, and Stroke palette will be viewed on the screen. Select at least 10 from the weight drop-down menu in the Stroke palette. In this stage, if color is imposed or changed, it will be clearly visible.

Color, Gradient, and None



Color, Gradient and None are the three icons respectively below the Fill and Stroke swatch. Clicking Color and Gradient icon separately activate the Color and Gradient palette. Click the None icon, and the fill of selected object or the color of stoke can be inactive or cancelled. If an object is filled with color or gradient, the color will be viewed. If the object is selected, the color will be changed as well.

Increasing and Reducing the Size of Object

Many minute jobs are done to create object. Doing these minute jobs may be troublesome in the usual size of the object. If a specific part of the object is enlarged, it facilitates the task. Viewing a page in an increased size while working in Illustrator is called Zoom in, and in decreased size is Zoom out. Object will also be viewed either big or small with increasing or decreasing size.

To view an object big or small, the visible size of the page will be made big or small by using Zoom Tool. To get the job done -



- The Zoom Tool will be selected, if it is clicked in the Zoom Tool box.
- After selecting the Zoom Tool, if the mouse pointer is brought on the screen, it will look like a flint-glass, and a plus (+) sign will be visible in the glass.
- The size of the screen will be bigger when clicked with the Zoom Tool on screen. With the increasing size of the screen, the object will remain on the screen enlarged. If it becomes enormously enlarged, some objects will not be viewed on the screen. Clicking on the screen and dragging with the hand-tool, that part can be brought on the screen.
- Press the Alt button while the Zoom Tool is active, and the Zoom Tool will be transformed into the Zoom Out Tool. Keep pressing the Alt button and continue clicking with the Zoom Out Tool, the size of the screen will gradually become smaller.
- Press Ctrl - or Ctrl = button to complete the work of Zoom out and Zoom in.

Changing the Positioning of Page By Hand Tool

If the size of the page is made smaller or bigger, the necessary part of the object can go outside the visible area. In this case, to shift the object to a suitable place on the screen

- Select the Hand Tool by clicking on it in the Hand Tool Box.
- Click on the necessary object with the Hand Tool, dragging it to a suitable place, and release the pressure of the finger on the mouse.

In this way, the positioning of the original page can be changed. The object that has been clicked will not be shifted in a different way.

Mode of Viewing Object

There are some modes to view objects in the Illustrator programme. Any of these can be selected from the View menu as required.

- In Outline Mode, the object is viewed as an outline or in a linear shape. In this mode, editing of the shape or structure of the object, particularly a detailed editing of a line or path can easily be done.
- The object is viewed perfectly in Pixel Preview or Preview mode.
- The image viewed in Overprint Preview Mode can be printed out.

Creating Object

In the preparatory stage of creating objects, the elementary process of making different kinds of shapes should be learnt, for example, squares, rectangulars, circulars, and elliptic, multi-angular, starry, and spiral shapes. To create an object-

- The Rectangle Tool will be selected if clicked with the mouse pointer.
- After bringing the mouse pointer inside the screen and clicking anywhere, drag diagonally below an inch and release the pressure on the mouse. A square or rectangular object will be created.

In the same process, select another object tool from the Tool box and make other objects. No object can be created trying only once. By erasing the object partially or fully, we can start in a new way. To get the task done, it is required to learn how to erase the entire object or part of the object.

Selecting Object and Erasing Borderline or Path

- If the object is filled with color, the object will be selected if clicked with the Selection Tool or Direct Selection Tool. Keep pressing the Alt button and click on the path of the object. The entire object will be selected.
- To erase the path of the object or the part of the path, select them with either the Selection Tool or Direct Selection Tool. Press Backspace or Delete button, and the Path or the part will be deleted.

If the Backspace or Delete button is pressed, the object is erased. Select the Cut command from the Edit menu, and the object goes to a temporary memory called clipboard and stays there until another object is cut or copied. When an object stays on the clipboard, selecting the paste command from the Edit menu will restore the object to the document.

Path

The path of the object can be formed with more than one segment. A single segment can also be used if necessary. The border of the object is called Path. A straight line is called Path too.

Selection Tool

- The selection Tool, Direct Selection Tool or Group Selection Tool can be used to select either the entire object or a part of an object.
- The selection tool is called the Black Arrow. Click the Selection Tool with the mouse pointer for using the tool, and it will be selected. If the mouse pointer is brought on the screen after selecting the tool, the mouse pointer takes the shape of a black arrow or selection tool. Click on the object and it will be selected. Selection Tool is also used to select the entire object.
- If any object is selected with the Selection Tool, rectangular, circular or bounding box is created around the object. Four hollow boxes on four corners and four on the four arms will be visible. These boxes are called Resize Box. Clicking and dragging on the resizing boxes, the size of the object can be enlarged and reduced. Keep pressing shift and drag, and the object will be bigger or smaller according to proportion.
- Clicking the centre of the selected object with the Selection Tool or on any of the arms or any part of the object and dragging, it can be shifted elsewhere.

For selecting more than one object together-

- After selecting the first object, keep pressing the shift button and select the next object. In this way, select as many objects as required. When all the objects are selected only one bounding box will square them.
- By clicking and dragging the resize box of the bounding box, all the objects will be enlarged and shortened together.
- Click the mouse pointer on an empty space on the screen, the object will be selection-free. If any particular object requires to be selection free from numerous selected objects, click the object while pressing the Shift button.

Direct Selection Tool

The white tool on the right of the Selection tool is called the Direct Selection Tool. This tool is called the White Arrow.

The Direct Selection Tool or the White Tool is used to select the segment of the object or the entire object. A part of the object can separately be enlarged or shortened by selecting any anchor point of the object with the Direct Selection Tool.

Grouping Object

To create a group of objects

A. Select either all or requisite objects.
B. The selected objects will be grouped, if the Group command is given from the Object menu.

Clicking on a blank space, make all the objects selection-free, and then click any object with the black arrow or the selection tool, and a rectangular bounding box will be created around the grouped objects. Thus the objects inside the selection box will be selected together.

To make the grouped objects ungrouped:

A. Click an object, and the grouped objects will be selected.
B. Give the Ungroup command from the Object menu, and the grouped objects will be ungrouped.

Lock the Objects

While working with more than one object, it is required to keep one or more than objects locked. As a locked object can not be selected, the editing work can not be done. So the locked object can not be changed by mistake.

To lock an object:

A. Select a particular object.
B. Give the Lock command from the Object menu.

If it is required to edit or change a locked object, unlock it. To unlock an object select the 'Unlock All' command from the object menu. Thus all the objects will be unlocked. An unlocked object can be edited in the usual way.

Use of Cut, Copy and Paste Command

After selecting any object with the selection tool and giving the Cut command from the Edit menu, the object will disappear and it will be copied if the Copy command is given. Any cut and copied object is stored on the clipboard, and if Paste command is given from the Edit menu, the object will be pasted on the screen. The object can be shifted elsewhere by dragging it with the selection tool.

If any object is dragged while Pressing the Alt button of the keyboard, it is shifted after a copy is created.

Give the Paste in Front command, and the object will be placed above the existing object.

Give the Paste in Back command, and the copied object will be placed below the existing object.

Layer

Layer means step. In this process, editing can be done while keeping different objects on different steps. This layer or step can be compared to transparent glass or polythene. If three objects or pictures are created on three glasses or transparent media and placed on one another, three objects will be viewed. These three glasses or media are regarded as layers.

The facilities of working in the layer process are as follows:

- Arranging steps among the Layers;
- Keeping more than one layer invisible;
- Keeping layers locked;
- Adding a new layer, removing unnecessary layers, etc.

Creating New Layers

If Layer palette is not viewed on the screen, give the Layer command from the Window menu, and the layer palette will be viewed. At the beginning, only one layer will be on the palette. After finishing the work of a layer, add a new layer on the palette to create new object. To add a new layer

A. A new layer will be added on the layer palette when you click the Create New Layer icon below the row of Layer Palette.

B. If any layer numbered serially needs to be identified with a particular name, double-click the layer and a dialogue box called Layer Options will be viewed. Type the necessary name on the Name box, and click the Ok button. The serial number or name of the concerned Layer (if the name was previously given) will be changed into the name typed in the dialogue box.

Cancelling Layer

A. By selecting the Layer and the Delete command from the pop-up menu on the layer palette, the selected layer will be cancelled.

- In the process of deleting a layer of artwork or an object, a cautionary message like ‘Delete Layer?’ will be viewed. Click the ‘Ok’ button, and the layer will be deleted. Click the ‘No’ button, and the deleting process will be stopped. But by clicking and dragging the layer, on to the Delete icon, no such message will be viewed.

Merging Layers

After creating and editing objects of two or more layers, they can be merged together. To get the job done:

A. Select the layers.

B. Select the 'Merge Selected' command from the pop-up menu of the layer palette, and the layers will be merged.

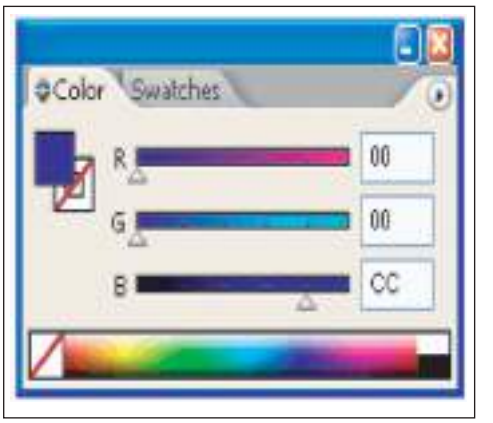
Use of Color in Object

After creating an object, fill in the color as required. The color palette, color bar, or color spectrum bar, gradient, etc. are used to fill color in the object.

Color Palette

If the color palette is not viewed on the screen, give the color command of the Window menu, and the color palette will appear.

- On the left above the Color Palette, an indicator box of Fill and Stroke or Swatch is found. Color Slider and Color Spectrum Bar are found below it. If the work is done on gray scale mode, only one color slider will be viewed. If the work is done on RGB = Red Green Blue mode, 3 color sliders will be viewed, and if the work is done on CMYK mode, 4 color sliders will be viewed.

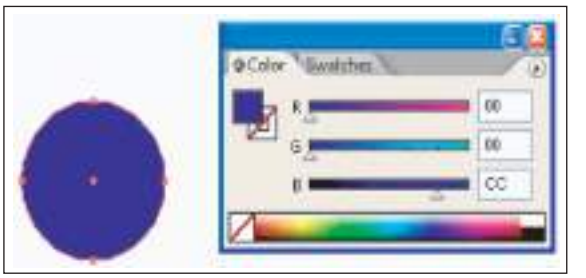


Fill Color

To fill color in any object:

A. Select the object.

B. Click the Fill Indicator box of the Color Palette, activate it. The activated Fill Swatch will stay above the Stroke icon.



C. Click the requisite color in Color Spectrum Bar.

- The selected object will be filled with the color from Color Spectrum Bar. On the extreme right of the Color Spectrum Bar, a Swatch of black and white color will be found. If the black swatch is clicked, the object will be filled entirely with a black color, and if the white swatch is clicked, the object will be filled entirely with a white color.

The Use of Stroke

The border of object is called Path. The measurement of making a path thick or thin is called Stroke. Objects of grouped and ungrouped path, straight, curved lines, etc. are controlled by Stroke. Controlling strokes means to make a path thick or thin and colored. Making a Stroke thick and thin can be done with the Stroke Palette. To get the job done -

A. Select the object or path. If the Stroke Palette is not viewed on the screen, click the Stroke command from the Window menu, and the Stroke Palette will be viewed.

B. When the object or path remains selected, click the downward arrow of the Weight box in Stroke Palette and keep pressing the mouse and many measurement units will be shown in the dropdown list. Select a number from the list as required. If a small number is selected, the stroke will be thin, and if a large number is selected, the stroke will be thick.

C. A measurement unit can be typed directly in the Weight box, if required. The fraction of a number can be used too. The thickness and thinness can be determined from 0-1000 points.

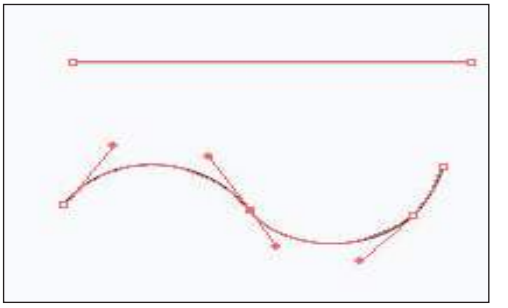


Pen and Pencil Tool

The main reason of the Illustrator programme being popular is the use of Pen Tool. It is possible to make complex and very small design and do the editing work with the Pen Tool.

Two anchor points are found at the two ends of a path or line. The first anchor point is called the starting point and the second anchor point is called end point.

There is a controlling handle with the anchor points of curved path and a control point outside the control handle. By clicking and dragging the control point, the curve of a line can be controlled. The anchor point, control handle, and control point are not viewed in the print out.



The Pencil Tool is another form of the Pen Tool. Curve lines can be made by dragging the Pencil Tool.

The Pen Tool is the main tool for drawing vector objects. A subtle object can be created by a keen path with the help of the Pen Tool.

Closed Path and Opened Path

A closed Path has no beginning and no closing point, as in a circle and square, etc. A closed path may have curved ends. On the contrary, an Open Path has a beginning and a closing end.

Pencil Tool and Pen Tool

A Path can be created easily with the Pencil Tool. By selecting the pencil tool from the tool box, and clicking and dragging it on the screen path, drawing a curved line is possible. The function of the pencil tool is like making a sketch on the paper. On the contrary, a path is created with the Pen Tool by clicking and dragging. To make a path with the Pen Tool -

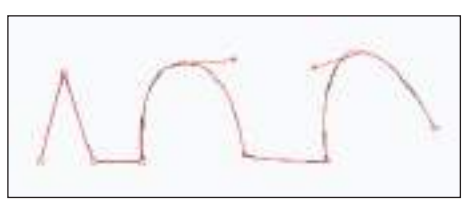
A. Select the pen tool from the toolbox. Click anywhere on the screen and release the pressure of your finger from the mouse.
B. Click a little bit above for the second time and release the pressure of the finger from the mouse.
C. Click on the right below from the place where you have clicked for the second time.
D. Click above the right a bit, and drag rightward.
E. Click on the right a bit below, and click again moving a bit rightward from the previous click.
F. Click on the right above and drag further right from this position
G. Click on the right below.

A wave-like open path object can be created in this way.

Editing Path

A path may not be created according to the expectation at the first attempt. After creating the path, give it the expected shape through editing. By editing the path, new anchor points can be added, and it can be removed if required or Cropped up or the two separated parts can be connected too. In this way, a change can be made as many times as required.

Adding Anchor Point



To add an anchor point at any point of the path:

A. Select the Add Anchor Point Tool from toolbox, and bring the mouse pointer inside the screen, a plus sign (+) will be found on the right below the Pen Tool.
B. Click any place of the path with the Anchor Tool Point, and a new anchor point will be set on that point.

- The new anchor point added on the straight path is called a Straight Corner Anchor Point and on the curved path is called a Smooth Anchor Point.

Removing Anchor Point

To remove any anchor point on the path:

A. Select the Delete Anchor Point Tool. After selecting the tool, bring mouse pointer inside the screen, and a minus sign (-) will be viewed below the Pen Tool.

B. If you click any anchor point with the Delete Anchor Point Tool, that anchor point will be deleted.

Editing Curve Path

A circle/rectangular object or a design will be created with the pen/pencil tool for editing path. To edit curve:

A. Selecting the Direct Selection Tool and after clicking an anchor point, drag and shift its position, and the curve and shape of the anchor will be changed.

B. Click an anchor point, and the handle of it will be viewed. Clicking and dragging the control point of any end of the handle, the part of the path related with the anchor point, and the curve can be reduced or increased. The direction can be changed too.

After creating open path with the Pencil or Pen Tool, the strokes can be thick or thin, and filled with color. After creating closed paths with the Pencil or Pen Tool, it can be filled with any color.

Writing Job

Writing is mandatory for the covers of books, magazines, posters, advertisements, cards, etc. The Type Tool is used for writing in Illustrator. Six kinds of Type Tools are found in Illustrator. Arrangement of writing can be done in three ways with these Type Tools, for example, Point Text, Area Text and Path Text.

Point Text

In the Point Text process, the way of typing is very easy. To type in this process:

A. Select the Type Tool from the toolbox.

B. Click any blank space of the screen.

C. Change the keyboard into Bangla for typing in Bangla.

D. Click ‘Character’ in ribbon on the screen, and the Character Palette will be viewed. Select the font from the Font Pop-up menu of the Character Palette.

E. Start typing following the rules of word processing. Click any letter with the Selection Tool, and a line will be viewed below it. This line is called ‘Baseline’.

Editing Writing

The requisite commands will be found in the Type menu and in the Character Palette.

Select the Character from the Type command of the Window menu, or press Ctrl T, and the Character Palette will be viewed floating on the screen. When it is floating, it can be used as required.

Selecting Letters



Letters, and words can be selected according to the rules of word processing while the Type Tool is selected. Click with Direct Selection Tool in the writing, the entire typed part i.e. the entire writing with the baseline will be selected. In this case, the letters will not be highlighted. The baseline under the letters will not be viewed.

Changing Color of Letters

To change the color of the letters:

A. The requisite letters or writings should be selected.

B. Click on the color on the bar of the Color Palette or Swatch Palette. The selected letters or words will assume the color.

Deleting Letters

A letter or letters or a paragraph or the entire writing can be deleted by pressing the Backspace/Delete button, if it is selected.

Enlarging or Reducing Font Size

A. Click the downward arrow on the right side of Font Size box in the Character Palette as the letter or letters are selected and keep pressing the mouse, and a list of measuring numbers about the Font Size will be viewed. Continue pressing the mouse and take on a measurement number, and the number will be selected. After giving the command, release the pressure on the mouse and the size of the selected letters will either be enlarged or reduced.

B. If the requisite measurement number is not found in the drop-down menu, place insertion pointer in Font Size box by clicking directly.

- By pressing the Backspace button, delete the existing measurement number and type new number.
- Press Enter button and the selected letter or letters will either be enlarged or reduced according to the measurement number.

Increasing or Decreasing Font Size Vertically and Horizontally

To get the job done:

A. Click the drop-down arrow on the right of Vertical Scale and keep the pressure on the mouse to get the list of measurement numbers. If a number

bigger than 100% is selected, keep the pressure on the mouse and drag. The font size will be vertically big. On the contrary, if a number smaller than 100% is typed, the font size will be vertically small. 100% is the ideal measurement of letter.

To increase or decrease fonts horizontally:

B. Click the drop-down arrow on the right of Horizontal Scale and keep pressure on the mouse to get the list of measurement number. If a number bigger than 100% is selected, keep continuing the pressure on the mouse and keep dragging. The font size will be horizontally big. On the contrary, if a number smaller than 100% is typed, the font size will be horizontally small. 100% is the ideal measurement of letter.

Baseline Shift

If any text written with the Direct Selection Tool is selected, the line seen below the text is called the Baseline. Shifting the lower edge of the text up or down is called Baseline Shift.

Selecting the measurement number from the drop-down menu in 'Set the Baseline Shift box' of the Character palette, or typing measurement number directly in the Set the Baseline Shift box, the measurement of Baseline Shift should be fixed. The use of a negative number will take the text below the baseline, and conversely a positive number will bring the text above the baseline.

The Leading

The space between the lines is called the 'Leading' which can be required for the text containing many lines.

A. By selecting a measurement number from the drop-down menu in Set the Leading box of the Character palette, or typing the measurement number directly in the Set the Leading box, and pressing the Enter, the Leading will be activated.

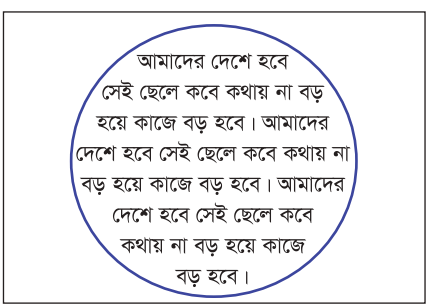
B. If the upward arrow button of Set the Leading box is pressed, the measurement of the Leading will increase, and if the downward arrow button is pressed, the measurement of the Leading will decrease.

Area Text

Any text typed or placed in square, rectangular, circular, elliptical or any closed path is called Area Text. To type or arrange text in a closed path:

A. Create a square, rectangular, circular or elliptical path.

B. After selecting the Type Tool, place the mouse pointer on the closed path, the Type



Tool will take the shape of the Area Type Tool.

C. Click on the anchor point of the path, and the insertion point will be placed inside the closed path, which will be used as a Text Box or Text Container.

D. Start typing.

E. When you will reach the right edge of a line, the insertion pointer will automatically go down the next line. If typing continues in this way, the next line will be automatically started.

Typing in the Path

Typing inside and outside the closed path, and below and above the open path can be done with the Path Type Tool of Illustrator. Typing inside and outside a circular object like making a monogram can be done.

Typing outside Circular Object

A. Make a circular object, and if it is filled with color, click the None icon either of the Color Palette or Tool Box to delete the color of the circle.

B. Select the Type on a Path Tool from the Tool Box as the circle is selected. Click the anchor point of this circle with the tool, and the insertion point will be placed outside the Path of the circle.



- The circle must be selected while clicking. If it is not selected, step 1 and step 2 should be completed after the selection.

C. If typing is started, the text will advance following the path of the circle usually from left to right. In the same way, the text will be arranged outside rectangular object if required.

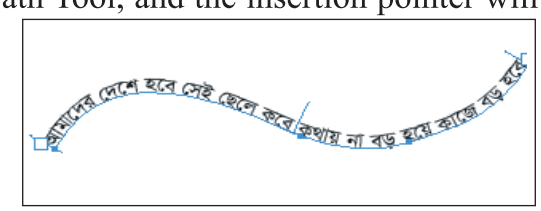
D. Click the text with the Direct Selection Tool and the Eyebeam between the Path and the text will be selected.

E. By clicking the edge above or below the Eyebeam and dragging it in a circular way the text can be shifted elsewhere.

Arranging Writing in Open Path

A. An Open Path can be created with the Pencil or Pen Tool.

B. Click on the selected Path with the Path Tool, and the insertion pointer will be placed on the Path.



C. Type following the usual rule.

- The Path and the Text will be selected if the text is clicked with the Direct

Selection Tool, and the text can be shifted elsewhere by clicking and dragging the Eyebeam while selected.

- The Path will be selected if clicked with the Direct Selection Tool, and the anchor point of the Path will be viewed. Now the Path can be edited following the rules of editing. If the Path is a curve, the text will follow the line.
- If the Path is smaller than the text, no additional text will be viewed. When the Path will be extended, the rest of the text will be viewed.

Creating Outline of Letters

When the outline of letters is created, the edges of the letters will be transformed into a Path. By clicking and dragging the Path and Anchor point, the shapes of the letters can be changed.



To create the outline of letters:

A. Select one or more than one letter or word.

B. Give the Create Outline command from the Type menu or press Shift Ctrl O, and selected text will be transformed into the Outline.

When the letters will be transformed into the Outline, the text will be changed into graphics. The shape of the letters can be changed following the rules of editing a Path, filling color and adding gradient.

Placement of Image in Illustrator

To place an image in illustrator:

A. Give the Place command from the File menu and a Place dialogue box will come.

B. Select the required file from the Place dialogue box.

- It should be known in which folder and under what name the file has been saved. The required file will be selected after opening the specific folder.

C. Click the Place button in the dialogue box, and the image of the selected file will be viewed on the screen.

- A cross sign will be viewed on the image when the image of the Photoshop is placed in the Illustrator. Click outside and the cross-sign will be removed. Click the image with the Selection Tool, and the image will be selected and four resize boxes on the four arms and on the four angles will be viewed. By clicking and dragging the resize boxes, the images can either be enlarged or reduced.

Group work

- Edit any image using Photoshop.
- Draw a monogram for any school in Illustrator.

Because of the version of software there may be difference in title and menu bar.

Exercise

Sample Questions

1. How many types of media are combined in multimedia?
   a. 1 c. 3
   b. 2 d. 4
2. Where is multimedia used?
   a. Preparing school results c. Keeping track of cricket scores
   b. Calculating market accounts d. Creating animated movies
3. Which of the following is a multimedia software?
   a. Microsoft Word c. Microsoft Excel
   b. Microsoft PowerPoint d. Microsoft Access
4. Multimedia applications include:
   i. Making text more visually appealing
   ii. Simplifying printing and publishing tasks
   iii. Easing accounting tasks

Which of the following is correct?
   a. i and ii c. ii and iii
   b. i and iii d. i, ii, and iii

Read the passage and answer questions 5 and 6:

Rakib is the head of a company. A team of foreign visitors is coming to inspect his company. He sits with his laptop, deciding what to present about his company. To do this, he uses a software program.

5. Which software would be most useful for Rakib to present his company to foreign guests?
   a. Microsoft Word c. Microsoft PowerPoint
   b. Microsoft Excel d. Microsoft Access
6. With the software Rakib will use, he can:
   i. Make presentations more attractive using animations
   ii. Demonstrate company activities using sound and video
   iii. Manage the company's financial accounts

Which of the following is correct?
   a. i and ii c. i and iii
   b. ii and iii d. i, ii, and iii

Short Answer Questions:

1. What is multimedia? Mention one use of multimedia in education.
2. What is animation? In which fields is animation most popular?
3. What is the purpose of PowerPoint?
4. How do you insert an image into a slide?
5. What is Illustrator? Mention one use of Illustrator.

Sixth Chapter

Problem Solving through Programming

After completing this chapter, we will be able to.....

- understand problem-solving;
- learn about programming languages;
- code using the Python programming language;
- solve common problems using the Python programming language.

Programming in problem solving

In real life, we encounter various types of problems. We need to solve these problems to move forward. Problem-solving is the process of identifying challenges or obstacles to understand the nature of the problem and find ways to overcome it. This involves analyzing the surrounding circumstances, thinking critically, and discovering possible solutions to the problem. This process typically includes defining the problem, considering potential solutions, evaluating those alternative solutions, and then implementing the best solution.

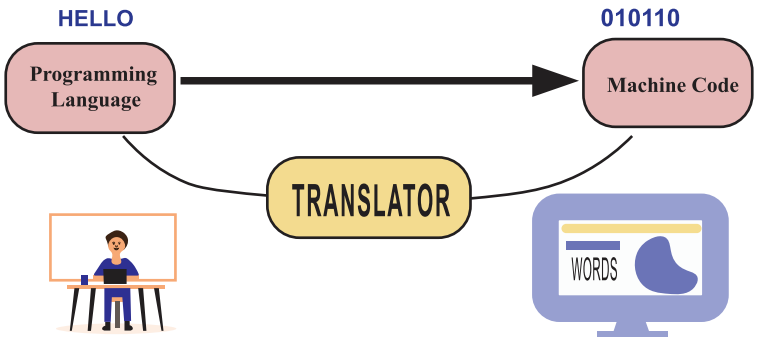


Programming Language

We use various languages to express our thoughts, such as Bengali, English, French, Latin, Spanish, etc. However, a computer cannot directly understand these languages. To give any instructions to a computer, we need to write them in a language that the computer can understand. Computers and any electronic devices can only understand 0 and 1.

But writing our instructions using only 0 and 1 is challenging for us. The languages we humans typically use are not composed solely of 0s and 1s. So, how can we communicate with computers? There are certain languages where, by following specific rules, we can write instructions that the computer can easily convert into a form it understands. These languages are known as programming languages. There are many types of programming languages, such as C, C++, Python, Java, and so on.

By learning any programming language, we can give various instructions to the computer as needed using that language. In a software application on our computer, we will first write the instructions in a specific programming language. The computer has a translation system that converts these programming language instructions into machine code.



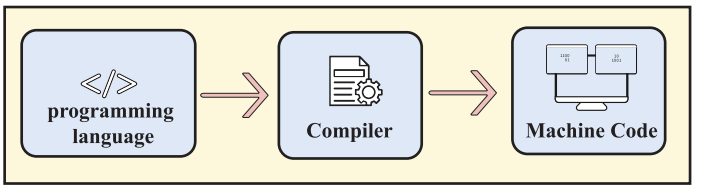
What is machine code or machine language?

Machine code or machine language is essentially a binary code made up of 0 and 1, which our computer can directly understand. Therefore, the task of translating between programming languages and machine code is done with the help of a type of program called a translator. By converting instructions into machine code through a translator, the computer can understand our commands and complete the specified tasks accordingly.

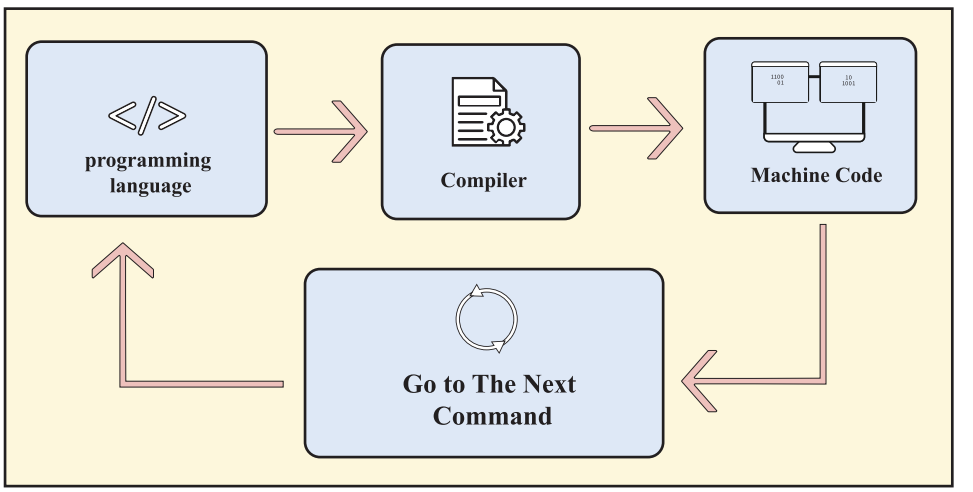
The translation system or translator program in a computer for programming languages can be of two types:

a) Compiler: In some translation systems, if all the instructions we give are correct, they will be converted into machine code all at once. This translation process is called compiling, and the software that performs this translation is known as a compiler.

However, if the compiler finds any errors in the entire set of instructions, it cannot proceed with the translation. Only when all instructions are error-free can the compiler perform the translation.



b) Interpreter: In some translation systems, regardless of the number of instru ctions we give, they will not be translated all at once. Instead, each instruction will be translated sequentially, one by one. This translation process is called interpreting, and the program that performs this translation is called an interpreter. The interpreter translates each instruction one at a time and will stop if it encounters an error in any instruction.



Which Programming Language to Learn?

To start, learning any one of the commonly used programming languages is enough. This is because the basic structure of all programming languages is similar, with only slight differences in the way instructions are written. For example, in the C programming language, each statement must end with a semicolon, but in Python, this is not necessary. Though there are some differences, there's no need to worry. Once you learn one programming language, it becomes much easier to learn others. Generally, the choice of a programming language depends

on the type of work and to some extent on personal interest. For those new to programming, Python can be an excellent starting point. Python is a fun and beginner-friendly programming language with simple syntax, and it is widely used in fields like web development, data science,and automation.

Starting the Journey of Programming in Python:

To write instructions or code in Python, we need to perform some tasks to set up the programming environment:

1. We need to download the Python application and install it on our computer. Python can be downloaded from this link.

   https://www.python.org/downloads/

   Afterthat, we download the latest version from there.
2. Once the application is downloaded, we proceed to install it. During the installation, we will see a window like the one below:

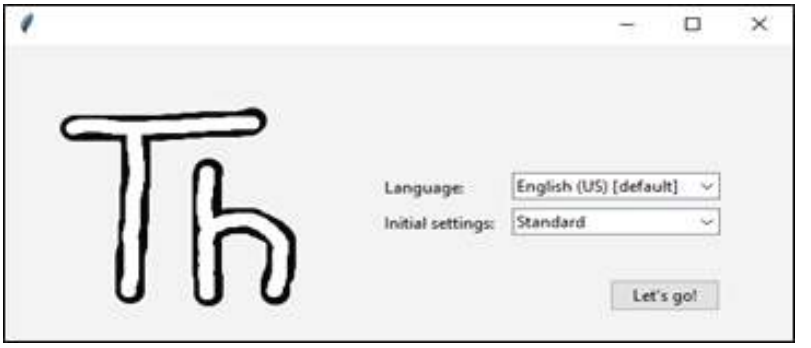


We will click the options at the bottom of the installation window and check the boxes. Then, we will click on the Install Now option. If it asks for permission to install, we will grant that permission as well.

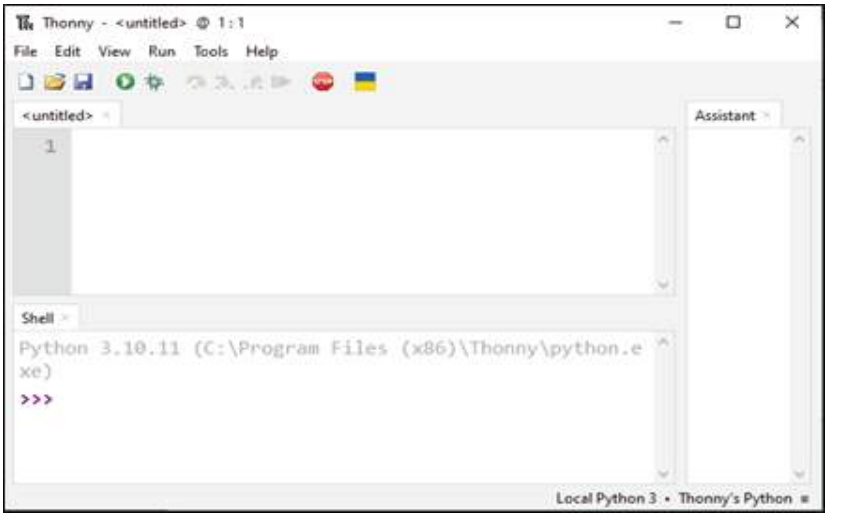
3. After that, we will see a message indicating that our setup was successful.
4. Python is now added to our computer. However, we will need another software application where we can write our instructions and communicate them to the computer. For that, let's go to this link: https://www.thonny.org/; from this link, we can download and install the thonny software.



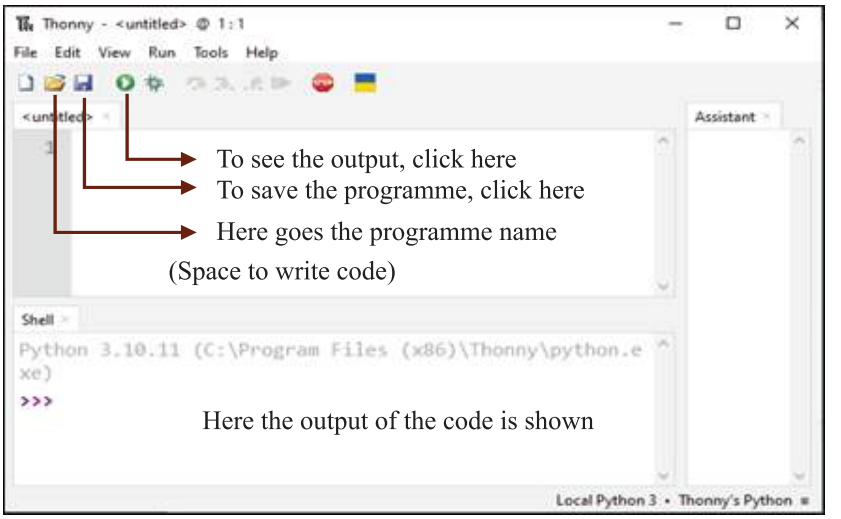
5. Afterthat, open the Thonny software. We will see a window like the one below.



When clicking the button, Let's go! a window like the one below will appear.



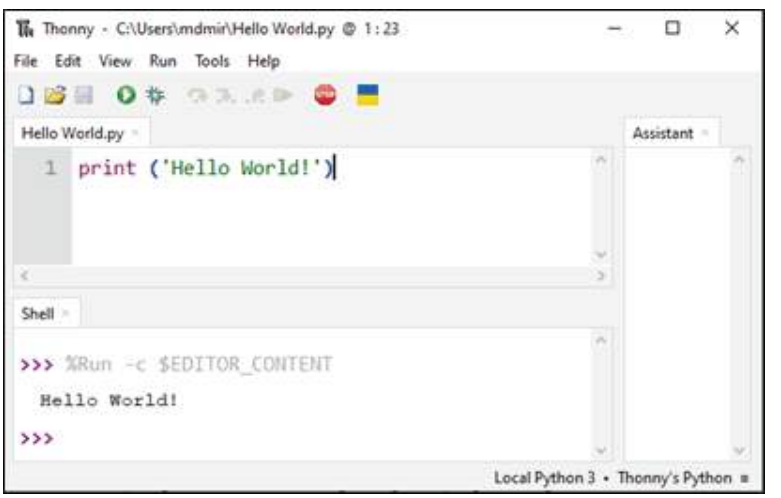
6. Let's understand a few important sections in this window.



7. Now let's write a programme which will print Hello World! as the output. The print() function is used to print something as an output. The text we want to print should be written within the print() function with ' ' (single quotation). So, to print Hello World! we have to write:

print (" Hello World! ")

Now clicking the 'Run' button will show Hello World! as the output.



8. Now we will click on the save button and save the file with a name of the programme. Then our file name will also be displayed on the top of the programme.

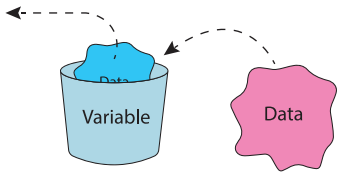
To Show Text

Just as we printed English text, we can also print Bangla.
Let's write down the following line and run it and see what happens:

print(' আমি বাংলাদেশকে ভালবাসি ')

So, the print() function prints definite texts on the monitor screen or other standard output devices. The message may be a string or any other object. Before appearing on the screen, the object will transform into string.

Using Variables in the Programme (Variable)



To store any information within a programme, we will use a variable. A variable is like a box within which certain information can be stored. The word variable means inconsistent. That is, if we want, we can store a piece of information in one line of the programme, then change that information in another line and store another piece of information. It may be noted that in Python it is not necessary to cite the data type of a variable. Even after setting the data type, it can be changed any time.

Naming the Variables

We all have a specific name, and everyone can recognize us by that name. Similarly, each variable also has to be given a specific name, with which we can recognize and use the variable throughout the programme. For example, if we create a variable called number where we want to deposit 9 as the value of the variable. Then we will write -

number = 9

There are a few things to keep in mind when naming variables:

1. The name of the variable will always be a word. That is, we cannot write the name of the variable with more than one word. However, if you want, you can exclude the spaces between the two words and give them the name of the variable as a word. Again, the variable can also be named with an underscore (_) sign between two words, omitting the space between them.

2. The first letter of a variable's name must be a-z or A-Z or underscore (_). The first letter cannot be a number (0-9) or any other symbol (e.g. * or etc.). However, after the first letter, any number (0-9) or a-z or A-Z or underscore (_) can be used as the remaining letters.

3. No other symbols such as @, $, %,^, etc. can be used in the name of the variable.

4. Python is a case-sensitive programming language. So, if the same letter is lowercase and uppercase, Python will treat them as two different variables. For example, My_variable and my_variable will be treated as two different variables.
5. Keywords are saved words in Python programme. We cannot use keywords as the name of variables or functions or any other identifiers. In Python 3.10, there are 35 saved keywords. For example, False, True, None, and, as, break, class, continue, if, else, except, while, return, for, global etc.

Incorrect naming of variable	Correct naming of variable
My Variable	MyVariable or My_Variable
National ID	NationalID or National_ID
this variable is cool	this_variable_is_cool
z!yan	zlyan or z_yan
9abc	abc9
$variable	_variable
@My_name	My_name
print	Keywords cannot be used as variable names. But Myprint or print1 is correct.

Storing or assigning data to variables

We use = symbol to store data in variables. This is called assigning value.
Suppose, we have a variable 'age'. Now, if we want to keep the value of age 25, we will write in the programme:

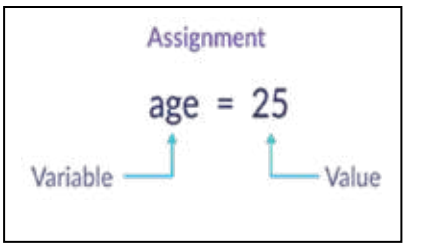
```
age=25
```

If we want to print this value then we have to write:

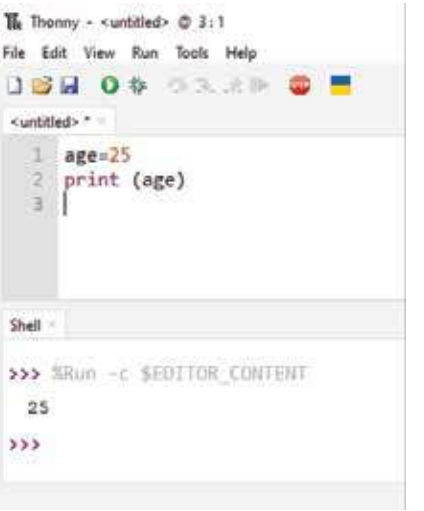
```
print (age)
```

Now if we write and run the following programme

```
age=25
print (age)
```



Then we will get output like the following figure:



Again, it is possible to change the value of a variable multiple times throughout the programme. When a new value is assigned to the variable, the previous value is deleted and the last assigned value is stored. If we run the following programme, what will be the output?

```
value_now=1
print(value_now)
value_now=2
print(value_now)
value_now=3
print(value_now)
```

Let's write the output of this programme in the box below.

```
1
2
3
```

Notice that in the above programme, we have printed the same variable value_now again and again. But as each time the data stored in the variable was different, we got different values after printing them.

Data Type

As we know, the computer processor has to work with whole numbers, fractional numbers, letters, words, boolean or logical data etc to process the data. A data type usually defines how much memory (bits or bytes) a piece of data occupies in computer memory and describes how the processor processes the data. There are different types of data types in Python programme. Some Data types are mentioned below.

a) int: Whole numbers are called integer numbers in English. So, if whole numbers are stored in the variable, its data type is called int. Here int is the short form of integer.

One such example is:

EmpId_no = 5

b) float: In this variable we can store fractional numbers. Such numbers are called floating numbers in English. Therefore, if fractional numbers are stored in the variable, its data type is called float. One such example is:

Age=45.50

c) str: If we want to store any text or textual information in the variable, then it is called string. And such information is included in str datatype. Here str is the short form of string. We have to put the text we want to put in the string variable inside single quotation marks. For example:

```
a='c'
b='This is a string variable'
```

d) bool: bool is the abbreviation of boolean. If True or False is to be stored as data in a variable, then it will be boolean data. Only two information can be stored in bool data type: True or False. One such example is:

a=True

Python programme has other datatypes besides int, float, str and bool; we will know about them if ever needed while writing a programme. The data we store in the variable is stored in the computer's memory. So, when we use the variable somewhere in the programme, the value of the variable stored in the computer memory will be used.

Change of Data Type: Type Casting

The data type of a variable can be easily determined using type(). If we print a variable inside the type() function, we will get the datatype of that variable.
For example, if we run the following programme:

```
test_variable = 73.07
print (test_variable)
print(type(test_variable))
```

We will get the following output:

```
73.07

<class 'flot'>
```

From here we understand that the information stored in the variable named test_variable is 73.07 and its data type is float.

During programming there may be times when the data type of a variable needs to be changed or specified. This can be done by casting. This is done using the casting constructor function in Python

Three important type casting functions are mentioned below.
int()- creates integers from floats or strings.
float()- creates fractional numbers from strings, floats or integers.
str()-creates strings from different data types.
Now consider the following examples

x = int(1) # the value of x will be 1 y = int(2.8) # the value of y will be 2 z = int("3") # the value of y will be 3	x = float(1) # the value of x will be 1.0 y = float(2.8) # the value of y will be 2.8 z = float("3") # the value of z will be 3.0 w = float("4.2") # the value of w will be 4.2	x = str("s1") # the value of x will be 's1' y = str(2) # the value of y will be '2' z = str(3.0) # the value of z will be '3.0'

Taking Data Input in a Program

If we want to take data input from the user in a programme, how do we do it? This task is very easy using the input() function. When the programme execution reaches the input() function, it pauses execution and waits for the user to provide input. Once the user enters some input, the programme resumes. For example, if we write the following:

test_input=input ()

So, the test_input variable will receive an input from us. However, no matter what type of data number, letter, etc. the input() function accepts as input within the programme, it will receive it as a string (str) data type. Now, let's take an input into a variable and print it.

```
test_input= input()
print(test_input)
print(type(test_input))
```

What will be the output of this programme, then? Whatever you input will be printed as the output. However, notice that even if you input an integer or a fraction, its data type is printed as str. This means that any data you enter will be received as a string by the input() function. But if you want the input to be stored not as a string, but as an integer or a float data type, you'll need to convert the data to that specific data type. By writing the programme as shown below, when taking any input, we can directly convert it to the desired data type in the input() function-

```
test_input = int(input())
print(test_input)
print(type(test_input))
```

After running the programme, notice that due to writing int(input()), the test_input variable is being converted to the int data type.

Also, if we want, we can give a specific comment or instruction when taking an input. To do this, we can write the command inside the input() function within quotation marks. For example, if we write:

```
test_input = intput ('Provide a sentence as an input:')
print(test_input)
print(type(test_input))
```

Then, after running the programme, it will first display an input command for us. Provide a sentence as an input:

Now, if we want, we can print additional words or sentences before and after printing the information we input. To do this, we will write the words or sentences we want to print inside the print() function within quotation marks, and then we will write the name of our variable after a comma. For example:

```
test_input=(input('Insert an integer number:'))
print('This is your integer number:', test_input)
```

Then, we will see the output as shown below:

Insert an integer number: 1245

This is your integer number: 1234

Here, notice that when we print text inside the print() function, we write it within single quotes (' '). However, when we print a variable, we write the name of the variable directly without any quotes.

Arithmetic Operations

We can easily use the following operators to perform mathematical operations (addition, subtraction, multiplication, division, and modulus):

+	This is the Addition operator. Using this operator, you can calculate the sum of the two variables on either side of it.
-	This is the Subtraction operator. Using this operator, you can find the difference between the two variables on either side of it.
*	This is the Multiplication operator. Using this operator, you can calculate the product of the two variables on either side of it.
/	This is the Division operator. Using this operator, you can divide the variable on the left side by the variable on the right side to get the quotient.
%	This is the Modulo operator. Using this operator, you can divide the variable on the left side by the variable on the right side to get the remainder.

Practical Problem # 1: Let's create a programme to take two numbers as input and print their sum.

Solution: The programme to take two integers as input and print their sum is given below-

```
num1 = int(input('Insert the first integer:'))
num2 = int(input('Insert the second integer:'))
result = num1+num2
print ('The sum of', num1,'and', num2, 'is', result)
```

When you run the above programme, you can input any two numbers of your choice, and then it will calculate the sum of those numbers, displaying the result as shown below.

Insert the first integer: 50
Insert the second integer: 100
The sum of 50 and 100 is 150

Modify the above program to create a programme that prints the results of subtraction and multiplication as well.

Operators for comparison and their use:

Relation operator	Example	Use
== (Equal)	Op1== 10 Op1== (Op2 + Op3)	When the operand on the right and the operand on the left are equal.
!= (Not Equal)	Op1 != 10 Op1 != (Op2 - Op3)	When the operand on the right and the operand on the left are not equal.
< (Less Than)	Op1<10 Op1< (Op2 - 10)	For creating expressions with multiple operands.
<= (Less or Equal	Op1<= 10 Op1<= (Op2-Op3)	When the operand on the left is less than or equal to the operand on the right.
> (Greater Than)	Op1>10 Op1> (Op2 + Op3)	When the operand on the left is greater than the operand on the right.
>= (Greater or equal)	Op1>=10 Op1>= (+Op2+Op3)	When the operand on the left is greater than or equal to the operand on the right.

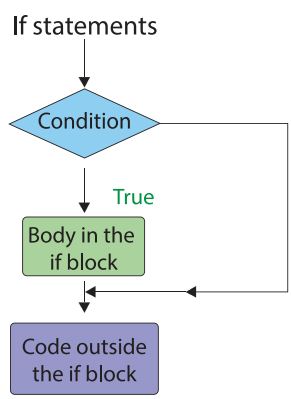
Here, Op1, Op2, Op3, are any valid variables. Relational expressions are formed with one or more variables or arithmetic expressions using relational operators.

Using Conditions in the Program

We will create a programme to calculate the results of an exam. Let's say the passing score for the exam is 40. Anyone scoring less than 40 will fail, while anyone scoring 40 or above will pass. Therefore, a condition must be considered, and passing or failing depends on that condition.

In Python, the if statement is used to execute a certain action or statement based on a condition. The use of the if statement can be compared to the meaning of "if." The format for using the if statement is as follows:

```
if condition:
    statement(s) to be executed if
statement just below if
```



The condition used in the if statement can generally be one or more logical or relational expressions, which are written after the if. The if condition statement must be followed by a colon.

If the value of this condition is true, the tasks described on the line following the if will be executed.

This part is also called the body of the if. Any valid simple or compound statement can be present here.

If the condition is false, the control will not go to the body of the if. As a result,

the tasks described in the body will not be executed, and the subsequent statements will be processed instead.

Practical Problem #2:

The minimum passing score in an exam is 40. If a student scores 40 or more in the exam, they will pass; otherwise, they will fail. Write a Python programme to determine the passing or failing status of a student based on the score obtained as input.

Solution: Below is the code for the programme.

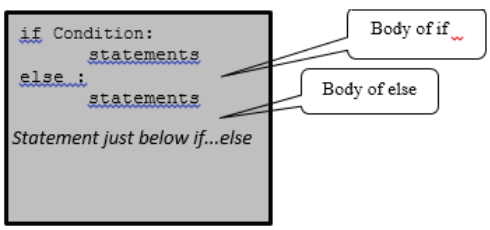
```
mark = int(input('Please enter your mark: '))
if mark >= 40:
    print('You have passed')
if mark < 40:
    print('You have failed')
```

Sample results obtained by running the programme:

Please enter your mark: 85
You have passed in the subject.

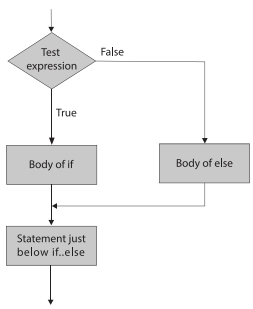
if...else Statement

In Python, the if statement is used to execute a specific action or statement based on a condition. The else statement, meaning "otherwise," is used along with if to specify an alternative action when the condition is not met. Therefore, this structure is known as the if...else statement. The format for using the if...else statement is as follows:



Here it is mentionable that the condition used in if...else control typically consists of one or more logical or relational expressions. A colon is placed after the if Condition statement.

If the condition is true, the tasks specified in the **Body of if** are executed. If it is false, the tasks in the **Body of else** are executed. Here, any valid simple or compound statement can be used. The flowchart of the if...else statement is shown in the diagram.



Practical Problem #3: Create a Python programme that checks if a citizen is eligible to vote based on their age.
Solution: In Bangladesh, any citizen who is 18 years old or older is considered eligible to vote. The programme will take the citizen's age as input. The code for the programme is provided below.

```
age = int(input('Please enter your age: '))
if age >= 18:
    print('You are eligible for voting')
else :
    print('You are not eligible for voting')
```

Practical Problem #4: Write a Python programme to determine if a number is even or odd.
Solution: The code for the programme is given below.

```
num = int(input('Insert a number= '))
   num%2!= 0:
    print('The number is odd')
else :
     print(' The number is even')
```

Sample Output from Running the Programme:

```
Insert a number = 67
The number is odd.
```

Practical Problem #5: Write a programme to determine whether a given year is a leap year or not.

Solution: To know if a year is a leap year, we need to divide the year number by 400. If the remainder is zero, it is a leap year. Otherwise, the year number has to be divided by 100. If the remainder is zero, it is not a leap year. On the other hand, if the remainder is not zero, then we need to divide the year number by 4 again. If the remainder is zero, then the year is a leap year; otherwise, it is not.

```
year = int(input('Enter the year (4 Digit) to check :'))
if (year%400 == 0 or (year%100 != 0 and year %4 == 0)):
    print(year, 'is a leap year.')
else :
    print(year, 'is not a leap year.')
```

The sample results obtained by running the programme-

```
Enter the year (4 Digit) to check :2012
2012   is a leap year.
Enter the year (4 Digit) to check :1990
1990   is not a leap year.
```

Practical Problem #6: Write a program to convert metres to feet and feet to metres.

Solution: The code for the programme is given below.

```
print('1:Feet to Meters, 2:Meters to Feet.')
choice = int(input('Enter Choice: '))
if choice == 1:
    num = float(input('Enter number of feet: '))
    print('Meters: ', round((num/3.28),3))
else  :
    num = float(input('Enter number of meters: '))
    print ('Feet: ', round((num*3.28),3))
```

The sample results obtained by running the programme-

1:Feet to Meters, 2:Meters to =Feet.
Enter Choice:1
Enter number of feet: 25
Meters: 7.622

1:Feet to Meters, 2:Meters to Feet.
Enter Choice: 2
Enter number of Meters: 60
Feet : 196.800

To check multiple conditions in a Python programme, the elif statement is used alongside the if...else statement, meaning else if. The elif statement is placed between the if and else statements. The elif statement is popular as an alternative to using multiple if statements in a programme. In other words, elif is used to check multiple conditions in a programme. The format for using the elif statement is as follows:

```
if (Condition1):
       Block1
elif (Condition2):
       Block2
... ... ...
else :
       DefaultBlock;

BlockN;
... ... ...
```

Practical Problem #7: Write a Python programme to determine if a given number is positive, negative, or zero.

Solution: The code for the programme is provided below.

```
num = int(input('Insert a number: '))
if num > 0:
    print('The number is positive')
elif num < 0:
    print('The number is negative')
else :
    print('It is zero')
```

The sample result obtained by running the programme-

```
Insert a number : 7
The number is positive.
```

The match Statement

In Python programming, the match statement is used for similar work of elif statement i.e. to execute a particular statement from multiple statements. In fact, instead of using more number of elif statements, the match statement is used. Additional case and break statements can be used with the match statement. In an elif statement, the appropriate statement is selected based on a conditional or relational expression. But, in a match statement, the appropriate statement is usually selected based on the value of a valid variable. The format of the match statement is:

```
match MatchExp:
       case Value1 :
              Block1
       case Value2 :
              Block2
       case Value3 :
              Block3
       case _ :
              DefaultBlock
BlockN
... ... ...
```

Here, the expression used with the match statement is called Match expression MatchExp. In the case statement, possible values for the match expression matchExp variable are provided. There should be at least one space between the case keyword and the possible values of the match expression variable, and it ends with a colon. A case statement usually has a default statement at the end, which ends with a colon.

Practical Problem #8: Write a programme to determine whether a lowercase English letter is a vowel or a consonant.

Solution: A lowercase English letter will be typed as input. The code for the programme is given below.

```
char = input('Enter the letter: ')
match char:
        case "a" :
                print(char, ' is a vowel ')
        case "e" :
                print(char, ' is a vowel ')
        case "i" :
                print(char, ' is a vowel ')
        case "o" :
                print(char, ' is a vowel ')
        case "u" :
                print(char, ' is a vowel ')
        case _:
print(char, ' is a consonant ')
```

The sample results obtained by running the programme-

Enter the letter: a
a is a vowel
Enter the letter: d
d is a consonant

Solution with Alternative Method : The programme above will show results only if a lowercase English letter is typed as input. The following programme will display results even when any English letter, whether lowercase or uppercase, is typed. The code for this programme is provided below.

```
char = input('Enter the letter: ')
vowels = ['a', 'e', 'i', 'o', 'u', 'A', 'E', 'I', 'O', 'U']
if char in vowels:
    print(char, ' is a vowel')
else :
     print(char, ' is a consonant ')
```

Practical Problem #9: Write a programme to find the largest number among three integers.

Solution: The code for the programme is given below.

```
num1 = int(input('Enter integer number 1: '))
num2 = int(input('Enter integer number 2: '))
num3 = int(input('Enter integer number 3: '))
if (num1 >= num2) and (num1 >= num3):
    print(num1, 'is the largest number')
elif (num2 >= num1) and (num2 >= num3):
    print(num2, 'is the largest number')
else :
     print(num3, 'is the largest number') -
```

The sample result obtained by running the programme-

```
Enter integer number 1: 10
Enter integer number 2: 20
Enter integer number 3: 30
30 is the largest number.
```

Repeating the Same Task: Using Loops in Programming

As we repeat certain tasks in our daily lives, we also need to perform some tasks multiple times in programming. When we want to repeat the same task several times in a programme, we have to use a loop. In programming, loop control statements are used to execute a statement two or more times. Some of the main loop control statements used in Python programming are:

- for statement
- while statement
- continue, break and pass statement.

Various statements are discussed below-

In a Python programme, for statement is used to execute a statement two or more times. The for loop is suitable only when we know how many times the loop will be executed. Usually, the number of iterations of a for loop is calculated using a variable. This type of variable is called counter variable. Following is the format of for statement:

```
for CounterInitialization in Condition :

        // Statement(s)
```

In the Counter Initialization section, the initial value of the counter variable is set. This is called the initialization or the beginning of the loop. In the Condition section, the final value of the counter variable or the condition for determining the final value is given. Statements associated with the for loop continue to be executed until the counter variable reaches its final value or as long as the condition is true.

Practical Problem #10: Write a programme to display a specific text multiple times.

Solution: Let's say, the text 'ICT' will be displayed 5 times.

```
for i in range(1,6):
    print('ICT')
```

Solution with Alternative Method 1: (Increment by 1)

```
for i in range(1,6,1):
    print('ICT')
```

Solution with Alternative Method 2: (Decrement by 1)

```
for i in range(1,6,-1):
    print('ICT')
```

The sample results obtained by running the program-

```
ICT
ICT
ICT
ICT
ICT
```

Practical Problem #11: Write a programme that will display a word 50 times.

Solution: The code for the program is given below.

```
var = input('Write a word: ')
for i in range(1,51):
    print(var)
```

The sample result obtained by running the programme-

```
Write a word: Computer
Computer  Computer  Computer  Computer  Computer
Computer  Computer  Computer  Computer  Computer
-         -         -         -         -
Computer  Computer  Computer  Computer  Computer
Computer  Computer  Computer  Computer  Computer
```

Practical Problem # 12: Write a programme to find the odd numbers from 1 to 100.

Solution: The code of the programme is given below-

```
for i in range(1,101):
    if (i%2 != 0):
print(i)
```

Running the programme will show the following result.

```
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97 99
```

Practical Problem # 13: Write a programme which will show the following result.

```
1
12
123
1234
.
.
.

123456789
```

Solution: The code of the programme is given below-

```
for i in range(1, 10):
    for j in range(1, i + 1):
        print(j, end=" ")
    print()
```

Running the programme will show the following result.

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9
```

Practical Problem # 14: Write a programme to determine the denominator or multiplication table of a number.

Solution: The code of the programme is given below-

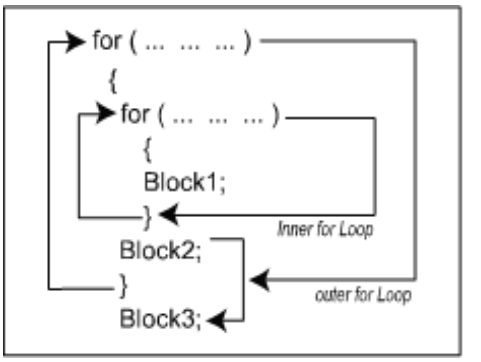
```
num = int(input('Enter a number: '))
for i in range(1,11):
    prod = num*i
    print(num, '*', i, '=', prod)
```

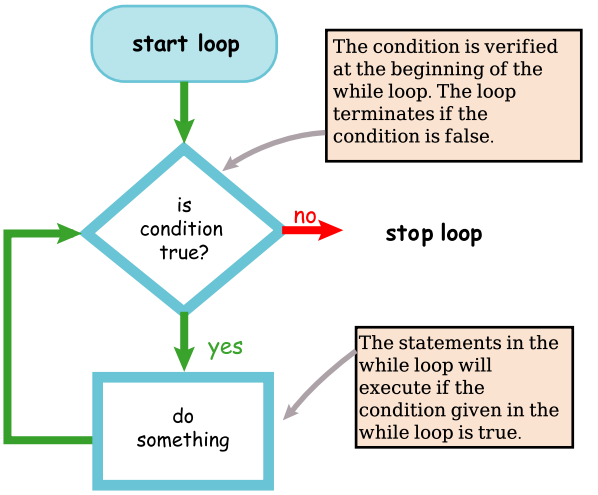
Running the programme and inputting the following sample data will show the result-

```
Enter a number : 3

3*1=3
3*2=6
3*3=9
3*4=12
3*5=15
3*6=18
3*7=21
3*8=24
3*9=27
3*10=30
```

A for loop statement may contain some other for statements. This type of for loop is called nested for loop, the intermediate for loop is called inner for loop and the external for loop is outer for loop. The inner for loop completes before the outer for loop.

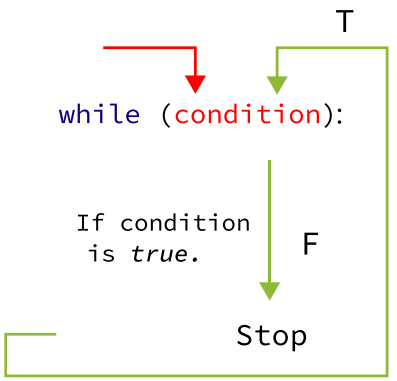




While Loop

A While Loop statement is used in Python programmes to execute a statement two or more times subject to a condition. The condition is verified at the beginning of this loop. The loop will only be executed if the given condition is true or non-zero. Otherwise, the loop will terminate, and no statement will be executed. The format of While Loop control is as follows:

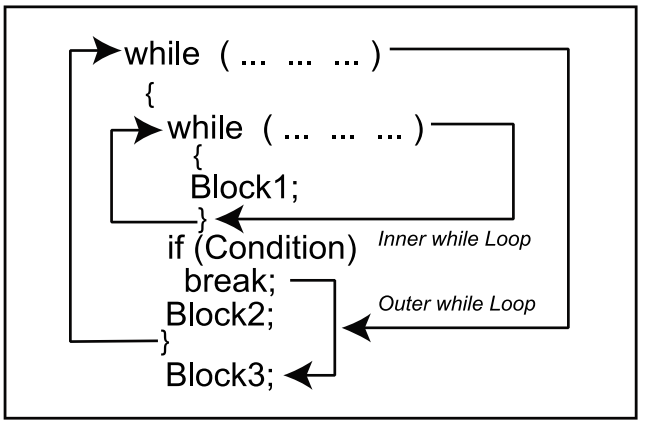
```
CounterInitialization;
while Condition:
       // Statement(s)
CounterDecrement/Increment;
```



The counter initial value with the appropriate data type is set in the CounterInitialization part.

The final value of the counter variable or the condition to determine the final value is given in the Condition part. the decrement/increment value of the counter variable is defined while revolving each time in the decrement/increment part. Statements associated with the While Loop will continue to be executed until the condition is true. The loop terminates whenever the condition becomes false.

The statement associated with the While Loop is usually a compound statement. If necessary, another While Loop or for loop can be used within a While Loop. Such an intermediate while loop is called a nested while loop.



Flowchart of nested a while statement.

While Loops are often used as alternatives to for statements. The number of iterations of the while statement is calculated using any previously declared counter variables like the for statement.

Practical Problem #15: Write a programme to display the text ICT multiple times using a while loop.

Solution: Let's say the text ICT will be displayed 3 times.

```
count=1
while (count<=3):
    print('ICT')
    count=count+1
```

The result after running the programme –

```
ICT
ICT
ICT
```

Practical Problem # 16: Write a programme to find the sum of the series 1+2+3+4+.....+100. Or, write a programme to find the sum of all positive numbers from 1 to 100.

Solution: The code of the programme is given below

```
sum=0
count=1
while (count<=100):
    sum = sum + count
    count=count+1
print('The sum of the value is ', sum)
```

Running the programme will show the following result-

```
The sum of the value is 5050
```

Continue Statement

In Python programmes, a continue statement is used to conditionally or unconditionally repeat a statement or loop. The format of the continue statement is-

```
continue
```

The continue statement moves the programme pointer to the previous statement or to the beginning of the loop. The continue statement cannot work directly without if, elif, for, while etc. For this reason, the continue statement is usually used to repeat a loop subject to the condition related to if, elif statements. In that case the conitnue statement is executed if the value of the condition is true, otherwise the compiler ignores the continue statement and executes the next statement.

A problem of programme to omit any number from 1 to 10 and display the remaining numbers using the continue statement is given in the next page-

Practical Problem # 17: Write a programme display the remaining numbers from 1 to 10 after omitting anyone number

Solution: Let's say, the omitted number is 4. The programme is given below-

```
for num in range(1, 11, 1):
    if num == 4:
        continue
    else:
        print(num, end=" ")

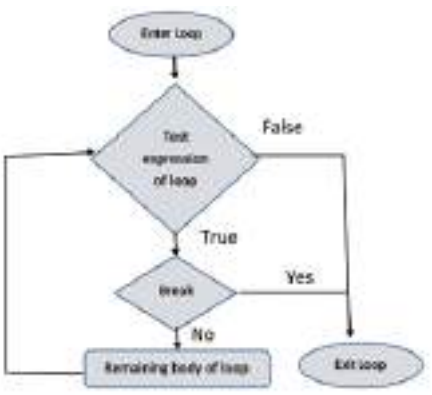
print('Used continue to skip printing the value 4')
```

Running the programme will show the following result-

```
1 2 3 5 7 8 9 10
Used continue to skip printing the value 4
```

Break Statement

If a break statement is found in the loop of Python programmes, the loop finishes its task there and comes out of the loop. Like a running vehicle that halts when its brakes are applied, the loop execution stops when a break statement is found in the loop. In most cases, the break statement is used with if, elif, etc.



Practical problem # 18: Write a programme to show the numbers up to from among 0 to 10

Solution: The code of the programe is given below:

```
for i in range(0,10):
    if i == 5:
        break
    print(i)
```

The following result will be shown if we run the programe:

0, 1, 2, 3, 4

Exercise:
Sample Questions

1. The role of a translator is:
   i) Converting all instructions into machine code at once
   ii) Converting instructions into machine code one by one
   iii) Converting machine code into Python code

Which of the following is correct?
   a. i and ii c. i and iii
   b. ii and iii d. i, ii, and iii

2. In Python, which function is used to display text on the monitor?
   a. printf() c. print
   b. print() d. printin()

3. Which of the following is a valid Python variable name?
   a. 9abc c. print
   b. $variable d. National_ID

4. In Python, if y = int(2.8), what will print(y) output?
   a. 2.8 c. 28
   b. 2 d. 2.0

5. In Python, given a = 5, b = 2, and y = a % b, what will print(y) output?
   a. 1 c. 3
   b. 2 d. 5

6. Consider the following Python code:

```
for in range(1,6):
   print('ICT')
```

How many times will "ICT" be displayed?
   a. 1 c. 3
   b. 5 d. 6

Short Answer Questions:

1. What are ‘compiler’ and ‘interpreter’?
2. What is machine code?
3. Write a Python program using a while loop to display "NCTB" three times.
4. Write a program to calculate the sum of all positive numbers from 1 to 50.

The End

2026 Academic Year

Classes Nine and Ten : ICT

বড় হতে হলে সময়ের মূল্য দিতে হবে।

–চার্লস ডিকেন্স



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