

Information and Communication Technology

Grade 8
Reading Book

Educational Publications Department

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The National Anthem of Sri Lanka

Sri Lanka Matha

Apa Sri Lanka Namo Namo Namo Namo Matha

Sundara siri barinee, surendi athi sobamana Lanka

Dhanya dhanaya neka mal palaturu piri jaya bhoomiya ramya

Apa hata sepa siri setha sadana jeewanaye matha

Piliganu mena apa bhakthi pooja Namo Namo Matha

Apa Sri Lanka Namo Namo Namo Namo Matha

Oba we apa vidya

Obamaya apa sathya

Oba we apa shakthi

Apa hada thula bhakthi

Oba apa aloke

Apage anuprane

Oba apa jeevana we

Apa mukthiya oba we

Navajeevana demine, nithina apa pubudukaran matha

Gnana veerya vadawamina regena yanu mana jaya bhoomi kara

Eka mavakage daru kela bevina

Yamu yamu vee nopama

Prema vada sema bheda durerada

Namo, Namo Matha

Apa Sri Lanka Namo Namo Namo Namo Matha

අපි වෙමු එක මවකගේ දරුවෝ
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ஆனந்த சமரக்கோன்
கவிதையின் பெயர்ப்பு.

**Being innovative, changing with right knowledge
Be a light to the country as well as to the world.**

Message from the Hon. Minister of Education

The past two decades have been significant in the world history due to changes that took place in technology. The present students face a lot of new challenges along with the rapid development of Information Technology, communication and other related fields. The manner of career opportunities are liable to change specifically in the near future. In such an environment, with a new technological and intellectual society, thousands of innovative career opportunities would be created. To win those challenges, it is the responsibility of the Sri Lankan Government and myself, as the Minister of Education, to empower you all.

This book is a product of free education. Your aim must be to use this book properly and acquire the necessary knowledge out of it. The government in turn is able to provide free textbooks to you, as a result of the commitment and labour of your parents and elders.

Since we have understood that the education is crucial in deciding the future of a country, the government has taken steps to change curriculum to suit the rapid changes of the technological world. Hence, you have to dedicate yourselves to become productive citizens. I believe that the knowledge this book provides will suffice your aim.

It is your duty to give a proper value to the money spent by the government on your education. Also you should understand that education determines your future. Make sure that you reach the optimum social stratum through education.

I congratulate you to enjoy the benefits of free education and bloom as an honoured citizen who takes the name of Sri Lanka to the world.



**Akila Viraj Kariyawasam
Minister of Education**

Foreword

The educational objectives of the contemporary world are becoming more complex along with the economic, social, cultural and technological development. The learning and teaching process too is changing in relation to human experiences, technological differences, research and new indices. Therefore, it is required to produce the textbook by including subject related information according to the objectives in the syllabus in order to maintain the teaching process by organizing learning experiences that suit to the learner needs. The textbook is not merely a learning tool for the learner. It is a blessing that contributes to obtain a higher education along with a development of conduct and attitudes, to develop values and to obtain learning experiences.

The government in its realization of the concept of free education has offered you about 91 textbooks from grades 6-11. I would like to remind you that you should make the maximum use of these textbooks and protect them well. I sincerely hope that this textbook would assist you to obtain the expertise to become a virtuous citizen with a complete personality who would be a valuable asset to the country.

I would like to bestow my sincere thanks on the members of the editorial and writer boards as well as on the staff of the Educational Publications Department who have strived to offer this textbook to you.

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Commissioner General of Educational Publications,
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2019.04.10

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1

Number Systems

This chapter will cover the following:

- Symbols of a given number system
- Base of a given number system
- Binary number system
- Decimal number system
- Conversion from decimal numbers to binary numbers
- Conversion from binary numbers to decimal numbers
- Representation of data using Binary number system

1.1 Use of number systems

Humans use computers for their everyday activities to make the tasks easier, more accurate and efficient, but computers are unable to understand the data and instruction provided in human languages.

The computer understands data and instructions such as text, numbers, images and sound that are fed to the computer by humans, as numbers (see Figure 1.1).

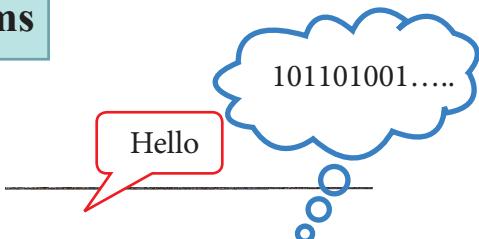


Figure 1.1 : Computer and user

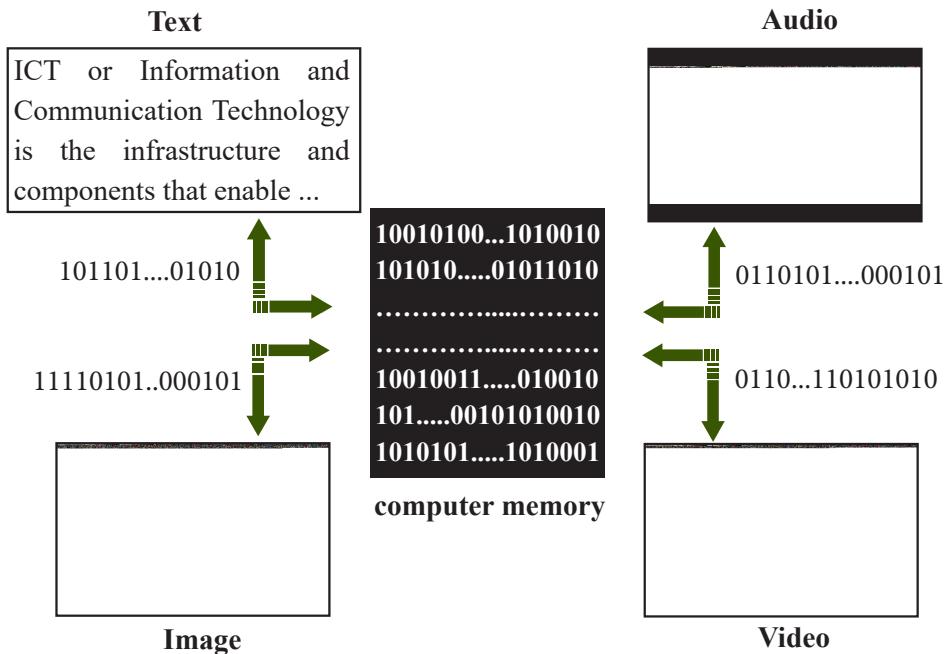


Figure 1.2 : Representation of different types of data in memory as binary digits

What is a number system?

A number system is a method that can be used to represent numbers. There are several different number systems. Each number system has a fixed number of different symbols.

1.2 Types of number systems

The *base* of the number system determines to which number system a given number belongs to :

We will learn about four different number systems. The following table shows the *symbols* and the *base* of each number system. The number of different symbols in a given number systems is the **Base** of that number system.

Number system	Symbols	Base
Binary	0,1	2
Octal	0, 1, 2, 3, 4, 5, 6, 7	8
Decimal	0, 1, 2, 3, 4, 5, 6, 7, 8, 9	10
Hexadecimal (Hex)	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F	16



Note - Only binary and decimal number systems are studied in Grade 8.



1.3 The base of a number system

The *base* indicates to which number system a given number belongs to. The base is shown at the right end of the number as a subscripted text.

e.g. -

binary number system - 101_2 , 111011_2 octal number system - 101_8 , 573_8
 decimal number system - 101_{10} , 47_{10} hexadecimal number system - 101_{16} , $7B_{16}$



Refer to workbook for Activity 1.1.



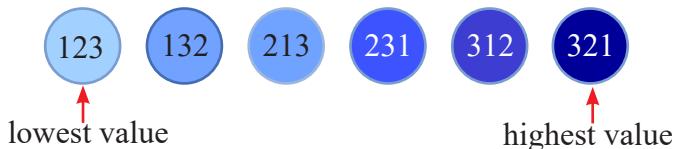
1.4 Decimal number system

Humans are familiar with the decimal number system. We identify the symbols here as numbers. We use the decimal number system for all arithmetic operations.

Symbols in decimal number system - 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

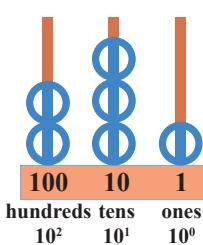
Each position in a given number has a place value.

e.g.- Shown below are examples using symbols 1, 2, 3 :



Let us learn about the formation of a decimal number.

Displaying 231 on a counting frame



231 in expanded form

$$\begin{aligned}
 \text{e.g. } 231_{10} &= \underbrace{2 \times 10^2}_{= 2 \times 100} + \underbrace{3 \times 10^1}_{= 3 \times 10} + \underbrace{1 \times 10^0}_{= 1 \times 1} \\
 &= 200 + 30 + 1 \\
 &= 231
 \end{aligned}$$

Place value

10^0 , 10^1 , 10^2 show the place value of decimal symbols.

Refer to workbook for Activity 1.2

1.5 Binary number system

The Binary number system uses two different symbols 0 and 1.

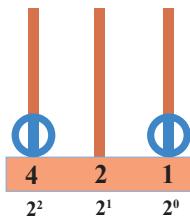
Symbols of binary number system - 0, 1

Binary symbols 0 or 1 are called bits.

Bit = **B**inary **d**igit → 0 or 1

Let us learn about the formation of a binary number.

Display 101_2 , counting frame



101_2 in expanded form

$$\begin{aligned} \text{e.g. } - 101_2 &= 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\ &= 1 \times 4 + 0 \times 2 + 1 \times 1 \\ &= 4 + 0 + 1 \\ &= 5_{10} \end{aligned}$$

$2^0, 2^1, 2^2$ show the positions of binary symbols.

1.6

The necessity of converting one number system to another

All input fed into the computer exist in the binary form. Subsequently, the data in the binary form in the computer is processed and the output is information in the form of text, image, sound, video, etc.

For example, if a user feeds a decimal number into the computer via keyboard, it is represented in binary form inside the computer.

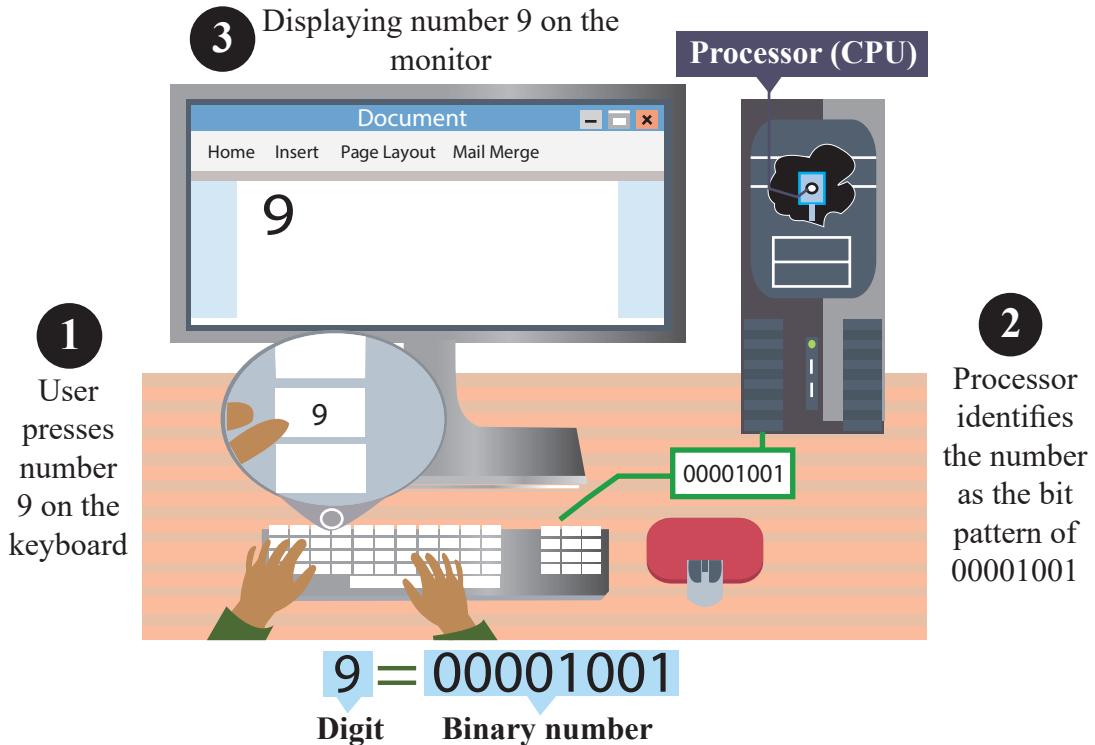


Figure 1.3 : Representation of a decimal number in binary form

Therefore, conversion from one number system to another is important.

1.6.1

Converting decimal numbers to binary numbers

In order to convert a decimal number to a binary number, the decimal number is repeatedly divided by two until the remainder is 0 and the remainder of the division can be written on the right side. After that, write all the remainders from the bottom to top to represent the decimal number in binary form. However, the number is displayed on the display screen as a decimal number.

e.g. - Converting 13_{10} to a binary number

$$\begin{array}{r}
 2 \Big| 13 \\
 2 \Big| 6 \\
 2 \Big| 3 \\
 2 \Big| 1 \\
 0
 \end{array}
 \quad
 \begin{array}{r}
 - 1 \\
 - 0 \\
 - 1 \\
 - 1
 \end{array}
 \quad
 13_{10} = 1101_2$$

Division	Quotient	Remainder
$13/2$	6	1
$6/2$	3	0
$3/2$	1	1
$1/2$	0	1

e.g. - 34_{10} Converting number 34 to a binary number

$$\begin{array}{r} 2 \overline{)34} \\ 2 \overline{)17} \\ 2 \overline{)8} \\ 2 \overline{)4} \\ 2 \overline{)2} \\ 2 \overline{)1} \\ 0 \end{array}$$

$$\begin{array}{r} - \\ - \\ - \\ - \\ - \\ - \\ - \end{array} \left| \begin{array}{r} 0 \\ 1 \\ 0 \\ 0 \\ 0 \\ 1 \end{array} \right.$$

$$34_{10} = 100010_2$$

Division	Quotient	Remainder
$34/2$	17	0
$17/2$	8	1
$8/2$	4	0
$4/2$	2	0
$2/2$	1	0
$1/2$	0	1

e.g. - 49_{10} Converting number 49 to a binary number

$$\begin{array}{r} 2 \overline{)49} \\ 2 \overline{)24} \\ 2 \overline{)12} \\ 2 \overline{)6} \\ 2 \overline{)3} \\ 2 \overline{)1} \\ 0 \end{array}$$

$$\begin{array}{r} - \\ - \\ - \\ - \\ - \\ - \\ - \end{array} \left| \begin{array}{r} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{array} \right.$$

$$49_{10} = 110001_2$$

Division	Quotient	Remainder
$49/2$	24	1
$24/2$	12	0
$12/2$	6	0
$6/2$	3	0
$3/2$	1	1
$1/2$	0	1



Refer to workbook for Activity 1.3.

1.6.2

Converting binary numbers to decimal numbers

In order to find the decimal equivalent of a given binary number, multiply each bit by its place value (Figure 1.4).

Binary digit	1	0	1	0	1	0	0
Place value	\times	\times	\times	\times	\times	\times	\times
	128	64	32	16	8	4	2
	128	0	32	0	8	0	0
Decimal value	$128 + 0 + 32 + 0 + 8 + 0 + 0 + 0$						
							$= 168$

$10101000_2 = 168_{10}$

Figure 1.4 : Converting binary numbers to decimal numbers

Power of 2

$$2^0 = 1$$

$$2^1 = 2$$

$$2^2 = 4$$

$$2^3 = 8$$

$$2^4 = 16$$

$$2^5 = 32$$

$$2^6 = 64$$

$$2^7 = 128$$

$$2^8 = 256$$

$$2^9 = 512$$

$$2^{10} = 1024$$

e.g. 1 -

$$2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0$$

$$\begin{aligned} 1 & \ 0 \ 1 \ 1 \ 1 & = & 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 \\ & & = & 1 \times 16 + 0 \times 8 + 1 \times 4 + 1 \times 2 + 1 \times 1 \\ & & = & 16 + 0 + 4 + 2 + 1 \\ & & = & 23_{10} \end{aligned}$$

$$10111_2 = 23_{10}$$

e.g. 2 -

$$2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0$$

$$\begin{aligned} 1 & \ 0 \ 0 \ 1 \ 0 & = & 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 \\ & & = & 1 \times 16 + 0 \times 8 + 0 \times 4 + 1 \times 2 + 0 \times 1 \\ & & = & 16 + 0 + 0 + 2 + 0 \\ & & = & 18_{10} \end{aligned}$$

$$10010_2 = 18_{10}$$

e.g. 3 -

$$2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0$$

$$\begin{aligned} 1 & \ 1 \ 1 \ 1 \ 1 & = & 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 \\ & & = & 1 \times 16 + 1 \times 8 + 1 \times 4 + 1 \times 2 + 1 \times 1 \\ & & = & 16 + 8 + 4 + 2 + 1 \\ & & = & 31_{10} \end{aligned}$$

$$11111_2 = 31_{10}$$

Refer to workbook for Activity 1.4.

1.7

Binary representation of data and instructions on computers

The computer uses ‘ON’ and ‘OFF’ states to represent data and instructions as a bit pattern of 1s and 0s.

Texts, sounds and images are stored in the computer memory as binary bit patterns. Hence, all data need to be converted into binary form before processing.

e.g. -

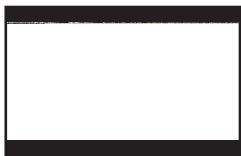
Data seen by humans



converting image to binary numbers

Data seen by the computer

1010...101010
11...11010101
.....



converting sound to binary numbers

11..1100101.0
010111...0101
.....

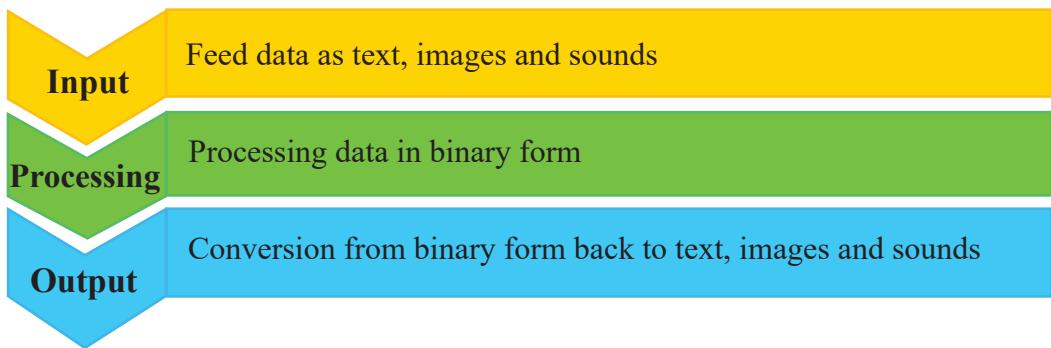
converting letter A to binary numbers

1000001

converting number 9 to binary numbers

0001001

Hence, the computer takes all inputs in binary form, processes them in binary form and provides them to the output devices in the form of text, images, sounds and videos.



All processes in a computer are performed using 0 (OFF) and 1 (ON) states. Data are fed to the memory of the computer in binary form. The binary data are sent to the processor and then sent back to the memory after processing. Subsequently, they are sent to the output devices. Figure 1.5 illustrates the flow of binary data among the different components of a computer system.

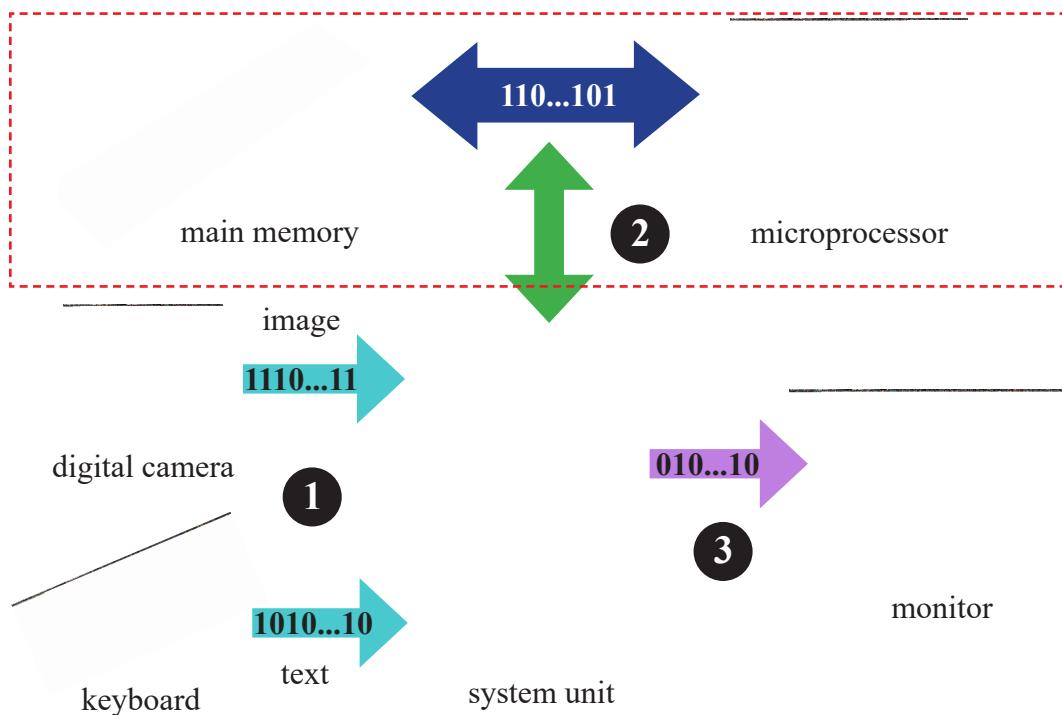
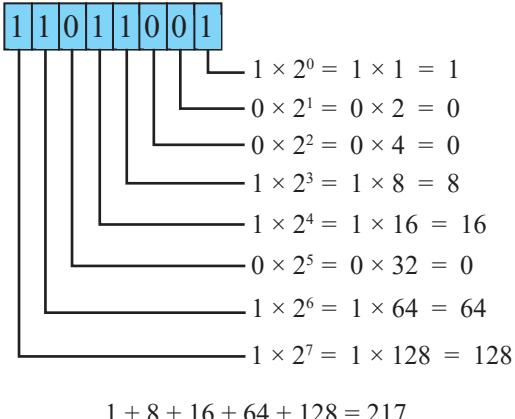
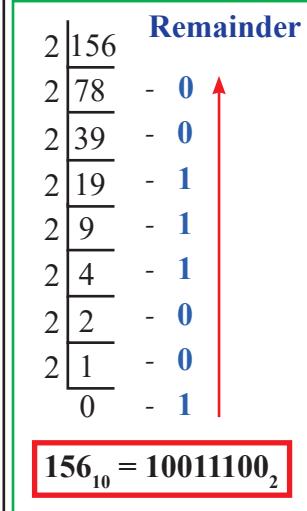


Figure 1.5 : Flow of binary data in a computer

All activities in the computer such as data input from the input devices (e.g., camera, keyboard), saving data temporarily in the main memory and saving permanently in the hard disk, processing data and sending processed data (information) to the output devices are carried out using digits 0s and 1s.

Refer to workbook for Activity 1.5.

Summary

Number system	Binary	Decimal
Symbols	0, 1	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Base	2	10
Number representation example	111010 ₂	367 ₁₀
Conversion examples	binary to decimal  $1 + 8 + 16 + 64 + 128 = 217$	decimal to binary  $\begin{array}{r} 156 \\ 2 \overline{)156} \\ -140 \\ \hline 16 \\ 2 \overline{)16} \\ -14 \\ \hline 2 \\ 2 \overline{)2} \\ -2 \\ \hline 0 \end{array}$ $156_{10} = 10011100_2$

2

Configuring and Formatting a Computer

This chapter will cover the following:

- Format date, the time zone, the time and currency
- File attribute configuration
- File searching
- Hardware troubleshooting
- Software troubleshooting



2.1

Formatting date, time zone, currency and numbers

The currency in my computer is dollar. Can I change it to rupees?

There is a time difference between my watch and the computer. I changed the time in the computer yesterday too. It has changed again today.

The computer operating system has the solution to both problems. We only have to format time and currency as required.

It is important to format the date, time zone, time, currency and number to suit the country where the computer is used.

2.1.1

The date, the time zone and time in a computer

The importance of setting up the date, the time zone and time in a computer

Format is useful in :

- Installing and updating software
- Working with application software, in scheduling to activate, shut down and updating.
- Updating the operating system software
- Activating software licenses

Date and time of a computer

It is important to have the correct date and time in a computer and maintain them, because file saving, searching, sending reminders, preparation of business letters, etc. use date and time of the computer.

Time zone of a computer

The countries in the world are divided into different time zones and they maintain a unique time according to an international standard. These time zones are used for legal, commercial and social purposes.

e.g. - 6.00 am in Sri Lanka will be 1.30 am in United Kingdom

Currency and its formats

The default currency setting of a computer is the currency of the country of which the operating system is produced.

Therefore, we need to modify the currency to suit our country.

Number formats

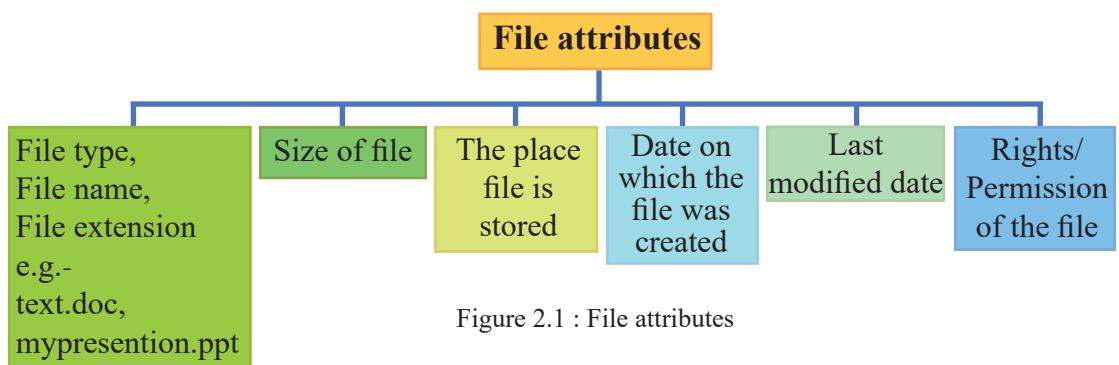
Absence of a currency and number formats to suit international acceptance, could be a drawback when working with the Internet.

Refer to workbook for Activity 2.1.

2.1.2

File attributes

Figure 2.1 given below shows most of the attributes of a file stored in the computer.





Note - File extension shows the file type
e.g. - executable file in the computer (.exe)

Advantages of file permission attributes

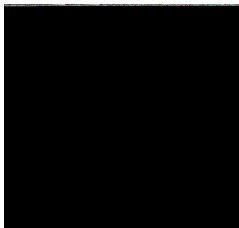
- File permission attributes provide important details regarding the file. Changing file rights can also help with the following;
 - The file can be made hidden.
 - As a file protection strategy, others may see the file, but it can be converted to a read only file which does not allow for modification.



Refer to workbook for Activity 2.2.

2.1.3

Searching files



Files are searched when the name of file or the place stored in, is unknown.

Several search methods are provided by an operating system. Files can be search by file name, file extension or date saved.

File extension can be used to search files by type. Using this, let us search for a file.

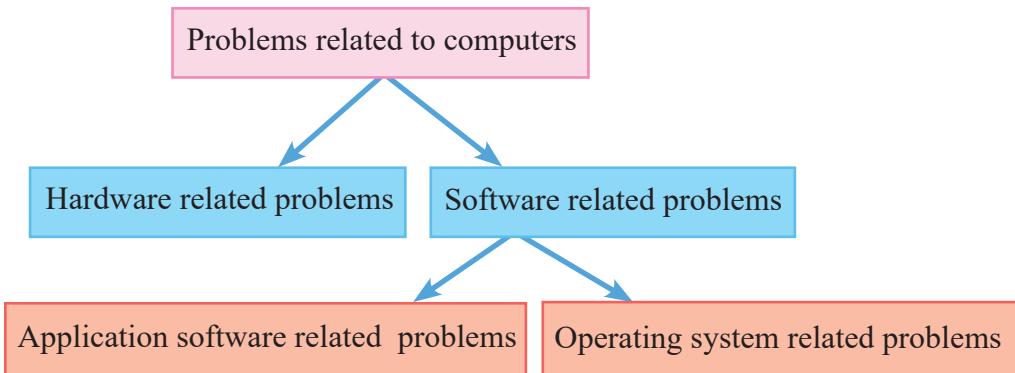


Refer to workbook for Activity 2.3.



2.2 Troubleshooting and maintenance of computer

There are two basic types of troubles we experience when we work with the computer.



First, let us study what hardware problems are.

To identify problems related to hardware, it is essential to identify ports used for connections.

1	PS/2 port _____	For keyboard/ mouse
2	VGA port _____	For monitor with VGA connection
3	DVI port _____	For monitor with DVI connection

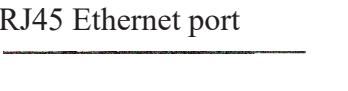
4	HDMI port 	HDMI is used to connect a television set instead of the monitor. Cables that are connected to this port can input and output both audio and video.
5	USB port 	For all devices with USB type connections
6	RJ45 Ethernet port 	For networking
7	eSata port 	For external storage devices
8	HD Audio port 	For high quality sound
9	Display port 	To provide higher performance in connecting digital display devices when compared to VGA and DVI ports

Figure 2.2 : Ports in a computer

In addition to the ports in figure 2.2, there are other ports in desktop, laptop, tab computers and mobile telephones. Let us identify those ports which are shown in figure 2.3.

Parallel port	This was mostly used for printer connection. However, the modern printers use USB cables. Therefore, modern computers do not come with this port.
Micro USB port	Connects smart devices such as mobile phones, MP players, photo printers and digital cameras.
SD card reader	For SD cards. Usually found in laptop and tab computers.

Figure 2.3 : Ports in a computer

We learnt about several ports used to connect devices to the computer. This knowledge is essential for troubleshooting of computers. Let us now explore troubleshooting and possible solutions.

2.2.1

Troubleshooting hardware problems

Examples for
hardware problems

- The computer does not function.
- The keyboard does not work.
- The mouse does not work.
- The monitor does not display.
- The speakers do not function.
- Network connections does not work.

Problem 01: The computer does not function when the power button is pressed.

Danger!

For activities connected with this unit, electricity has to be used. Be cautious! Do the activities under the direct supervision of the teacher.

In checking the power supply, first disconnect the main power supply.

Let us look into the possible solutions;

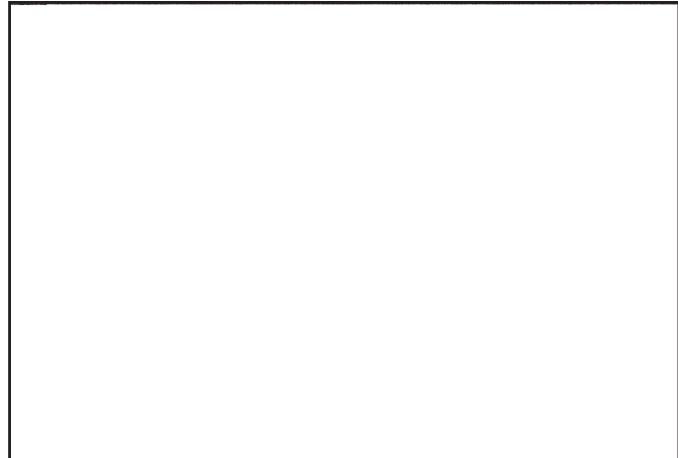
Solution 01 :

Examine whether the cables connecting the computer and the main port supplying electricity are well connected.

Power supply to the computer may be direct from a wall socket or through a UPS.

Step 1 Disconnect power supply from the wall socket.

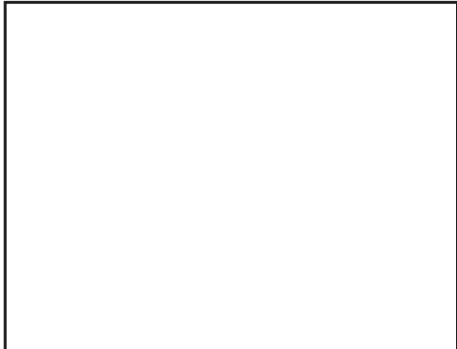
Step 2 Check whether the plug to the UPS is properly connected. Check whether the cable to the computer from the UPS is connected properly. If they are not connected, connect them properly.



Step 3 Check whether the cables connecting the computer and the monitor to the UPS are connected properly. Sometimes, a system unit may be used to supply power for the screen. In such a situation, check both ends of the cables and fix properly if connection is loose.



Step 4 If all the above items are connected properly, power on the UPS from the main supply.



Step 5 Next, switch on the computer. It is most likely to get started. If it does not, seek technical assistance.

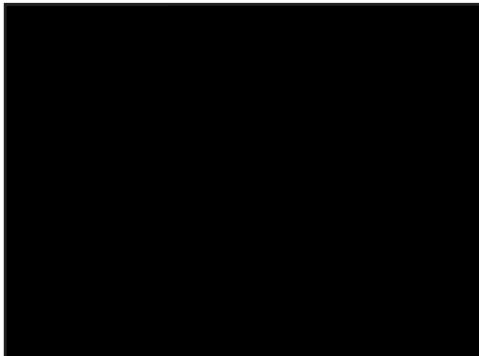
Solution 02 :

If the power supply is direct from the main supply, follow the steps below;

Step 1 Disconnect power supply from the connection on the wall socket.



Step 2 Examine the power cables and the cables connecting the computer and the screen. If they are not properly connected, connect them correctly.



Step 3 Once all cables are connected, plug the power cable.



Step 4 After that, switch on the computer. Most likely, the computer will start. Otherwise seek technical assistance.

Problem 02 : The keyboard or the mouse does not function.

Solution 01 : Restart the computer. Check whether the keyboard or the mouse is activated. In most cases, they are likely to. If not, carry out the following.

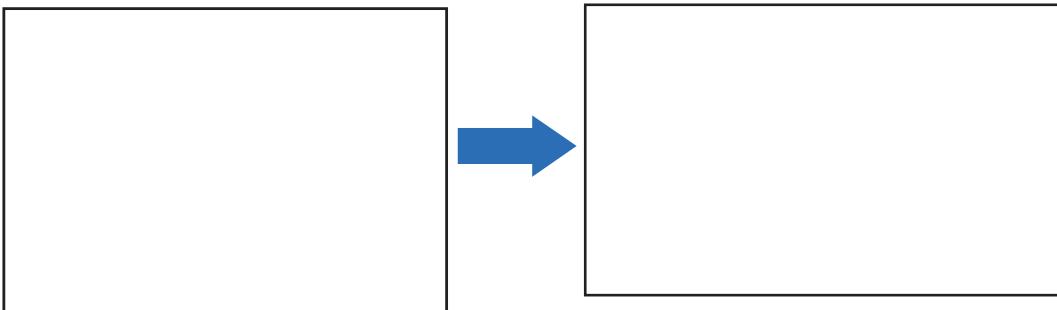
Solution 02 :

Step 1 Shut down the computer.

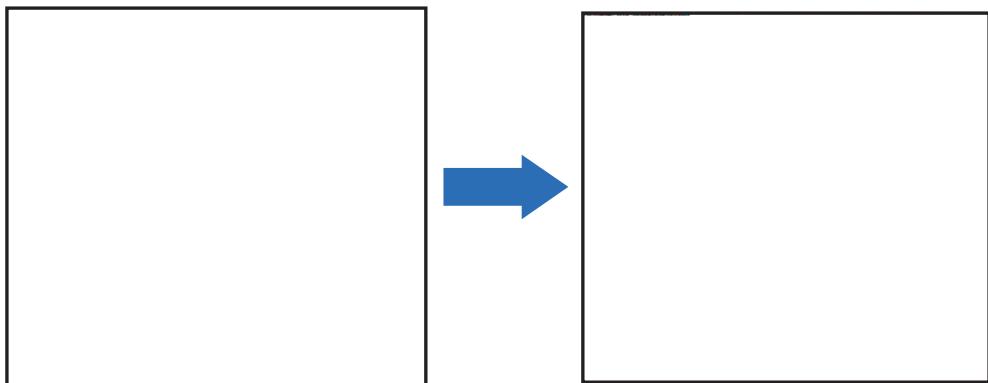
Step 2 Follow the steps below to connect the keyboard and the mouse with respective ports.

There are two types of mice. They are USB and PS/2. (old type)

- i. If the mouse has a USB port, connect it firmly to the port as shown in the illustration.



- ii. If the keyboard and the mouse have a PS/2 ports (old type), connect them with the PS/2 ports, properly.



Restart the computer after proper connection. The mouse and the keyboard most likely, would work. Otherwise connect another keyboard and mouse to test whether the fault is with the keyboard and mouse. If they too do not work, seek technical assistance.

Problem 03: The monitor does not function.

Solution :

Step 1

Check whether the power button of the monitor is switched on. If not, switch on. If it does not work yet, perform the following steps.

Step 2

Restart the computer. The monitor should work upon restart. Otherwise, perform the following steps.

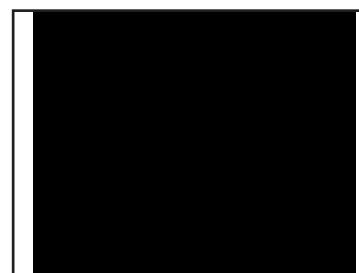
Step 3

The cables connecting the port may be VGA, DVI, HDMI or display port. They may not be connected properly. Check the connections as shown in the illustrations below;

VGA



DVI

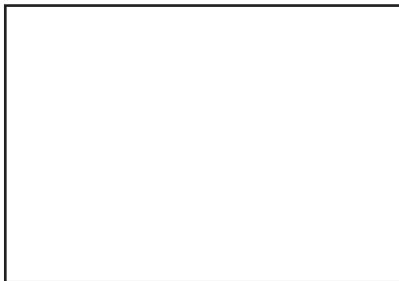


HDMI



Step 4

Check the connectivity of the power supply cable to the monitor as shown in the following picture. If not, connect them properly.

**Step 5**

If you follow the above mentioned steps correctly, the monitor will function properly when you restart the computer. Otherwise, test with another monitor to check whether the problem is with the monitor. If it still does not work, seek for technical assistance.

Problem 04: Faulty speakers**Solution :****Step 1**

Check the speakers by increasing the volume to a higher level. If there is no sound still, perform the following steps;



volume control

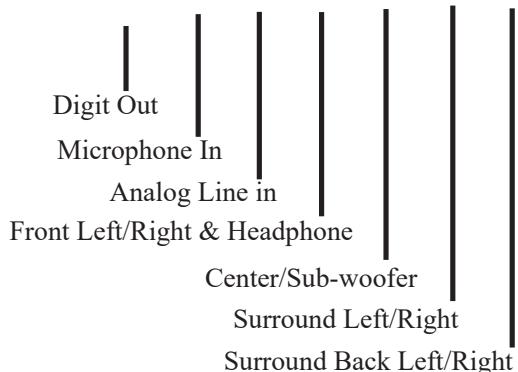
Step 2

To check whether the volume is minimized by the operating system, check the sound icon in the task bar at the bottom right hand of the computer. Check whether sound has been minimized or muted. Double click on the speaker icon and move the slider up and down to test sound. If it does not work, go to step 3.

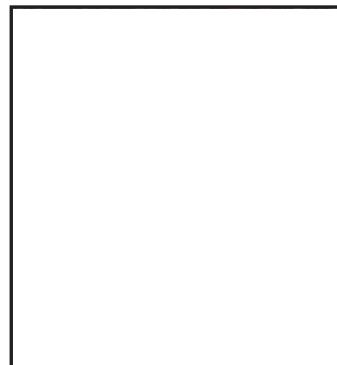


Step 3

The cables that connect the computer and the speakers vary according to the technology used in the speakers. If HD Audio technology is available in your computer, check whether the cables are connected as shown in the picture. If not, connect them as shown.

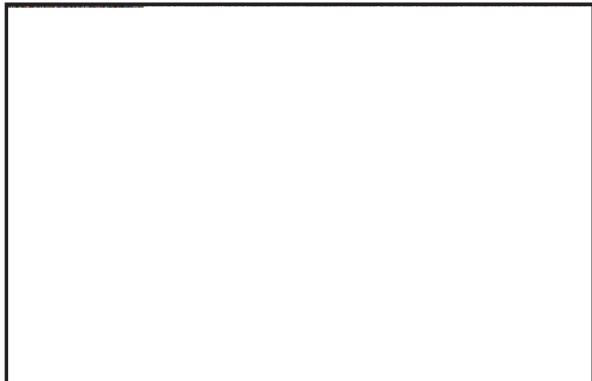


If your sound system has optical digital audio technology, you need only one cable to connect. Connect cables correctly to the port as shown below;



Step 4

Most sound systems require separate power supply. There is a cable attached to the speaker for this purpose. Check whether this cable is connected to a port for power. Otherwise, connect the cable for power supply.

**Step 5**

Follow all the steps specified above and restart the computer. Sound is most likely to work. Otherwise, check whether the fault is with speakers of your computer. Connect another set of speakers to the computer. If the trouble continues, proceed with the following steps;

Step 6

If the audio device driver is not properly installed, it has to be installed correctly. Seek assistance from your teacher for that.

Step 7

If all the steps described above fail to work, seek technical assistance.

Problem 05: Network connection failure.

Note - A computer gets connected to a computer network with the RJ45 connector, via the network switch. There is an Ethernet port in the computer for this purpose.

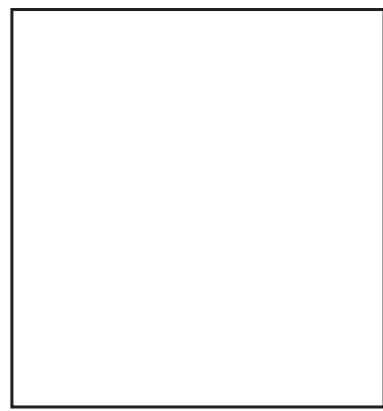
Solution :

Step 1

Check with the illustrations below to see if the connection is proper. Otherwise, reconnect properly. If it is connected properly, the ethernet window flashes a small green light.



RJ45 Connector



Computer interface

Step 2

If the computer does not get connected to the network, right click on the computer icon at the bottom right of the task bar. This will give a menu for "Troubleshoot problems." Click on this. The operating system will fix the problem and connect to the network.



Note - In addition to network cables, there may be other settings to be set up. Permission for these settings has to be gained through a network administrator account. Therefore, you will need the assistance of your teacher to change such settings.

2.2.2

Software problems

There are two types of software problems as shown in the figure 2.4.

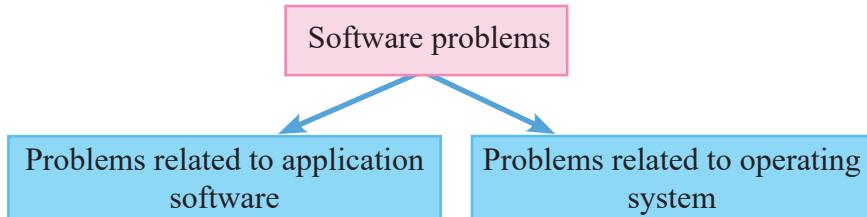


Figure 2.4 : Software problems

Application software

Application software is a computer program that is designed to perform specific tasks.

- e.g. - Word processing software (e.g. - MS Word)
- Spreadsheet software (e.g. - MS Excel)
- Web browser (e.g. - Firefox, Chrome)
- Image editing software (e.g. - Paint)

Troubleshooting application software problems

The following some example for application software problems;

- Does not run
- No response, even though it is open
- Inability to see the interface
- Takes long time to load and is slow
- Does not respond to user commands
- Indicates incorrect functioning

Solution 01 :

The simplest solution is to close the application software and reopen. If this does not work, follow the below steps.

Solution 02 :

Find out if the software is compatible with the specification of the computer and with the installed operating system. Software compatibility is the feature of software components or systems which allows to function together. A software

which is compatible with one computer environment may not be compatible to another. For instance, some software that are compatible with Windows operating system do not work with Mac operating system. Therefore, check whether the software is compatible with the computer's operating system. If software is compatible go to the next step.

Solution 03 :

Check whether the software is licensed. Further, check whether the trial period of software is expired. Unlicensed software or software with expired trial period can cause problems. Otherwise, proceed to the next step.

Solution 04 :

Try 'Repair' option of the application software. Restart the computer and reopen the application software.

Solution 05 :

Uninstall the problematic software from the computer and reinstall the same software. You will need assistance from the teacher for the 4th and 5th solutions.

Problem : The above problems of application software may be resolved easily. Sometimes, such problems can occur due of viruses. Let us see how to resolve such problems.

Solution :

Scan the computer using an antivirus software. Restart the computer and the application software.



Note - Computer virus is a malicious code which harms the computer system, destroys data and has the ability to replicate itself.

Problems in operating system

Some of the problems relating to operating system are;

- Slow in starting the computer
- Not being responsive to user commands due to slow processing
- Displaying a blank desktop screen

Problem 01: Slowness of computer



Note - A computer may slow down due to several starting up application programs or due to smaller space in the hard disk. To resolve this problem, logging from an administrator account is necessary. Your teacher will attend in solving these problems.

Solution :

Step 1 Close unnecessary application programs running at start up of the computer.

Step 2 Remove unnecessary files from hard disk. Use "Disk Cleanup" tool of the operating system for this purpose.

Step 3 If these solutions fail, use 'Repair' option of the operating system.

Step 4 If 'Repair' option too does not work, then reinstall the operating system.

Problem 02: Blank desktop



Note - Desktop icons may not be seen due to a problem of the operating system or operating system settings.

Solution 01 :

There are two modes to display the desktop in Windows 10 as;

- Tablet mode
- PC mode

If the mode is set to Tablet, desktop icons will not be displayed. Hence, it is necessary to follow the steps given below;

Step 1

Click on the speech button  on the task bar. (On the left hand side of the time)

**Step 2**

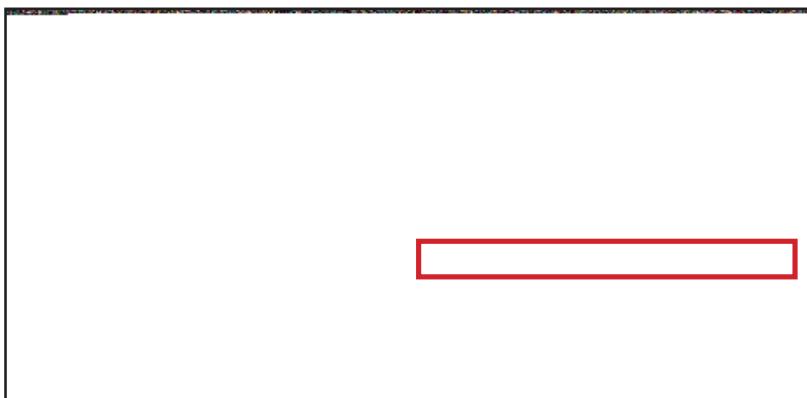
Then, the Windows action center opens. Several rectangular tiled buttons are seen at the bottom. Click the "Tablet mode" button. This option changes tablet mode to PC mode which makes the desktop icons visible.

**Solution 02 :**

If icons are still not visible then, the desktop icons may be disabled. To enable them, follow the steps given below;

Step 1

Right click on the desktop. Click on the "View" menu to see the following sub menu;



Step 2 Click "Show desktop icon" in the sub menu. The symbol "√" will appear on "Show desktop icons". (Desktop icons will now appear on the screen.)

Solution 03 :

If the screen is still blank, the issue may be in the operating system. Access to administrator account is necessary with the assistance of the teacher in order to troubleshoot the issue.



Refer to workbook for Activities 2.4 and 2.5.

Summary

Operating system can be used to change the configuration and settings of a computer.

- It is important to set the date and time in a computer since the date and time is used by the operating system in saving files, searching files, sending reminders and in business correspondence.
- Countries in the world are divided into time zones according to the international standards. These time zones maintain a unique, standard time for legal, commercial and social purposes.
- Currency and their symbols should be adjusted to suit the country standards.
- There are international formats in writing numbers and currency etc.
- There are several attributes in a saved file;
 - Place where it is saved
 - Date of last modified
 - Type of file
 - Size of file
 - Date on which the file is created
 - Rights to access the file
- When a need arises to open a saved file and if the name or the place saved is forgotten, file search can be used to locate it.

- Ports are used to connect a computer to peripheral devices.
- The user may experiences two types of problems in using a computer;
 - Hardware related simple problems
 - Software related simple problems
- Troubleshooting hardware related simple problems
 - Keyboard/ mouse related problems
 - Problems with monitors
 - Problems related to speakers
 - Failure to connect to network
- Troubleshooting software related simple problems
 - Problems with Operating System
 - Problems with application software
- Computer virus is a malware (malicious software) which has the ability to cause problems the computer system, to destroy data and replicate itself.

3

Word Processing

This chapter will cover the following:

- What word processing is
- Use word processing software to;
 - Create, open, save and close a document
 - Highlight text
 - Insert files/objects
 - Insert a graph
 - Check for spelling, grammar
 - Prepare lists

Our teacher wanted me to prepare invitation cards for the English Day Competitions. But my hand writing is not nice and clear.

I have to prepare a souvenir for the event. I tried to prepare it manually, but my illustrations are not attractive. Isn't there a better way to do this?

Why not? We can prepare all the documents nicely. We only need a computer with word processing software.

Creating documents using word processing software is known as *word processing*. Word processing software is an application software that can create various types of documents. Some examples are shown in Figure 3.1 below;

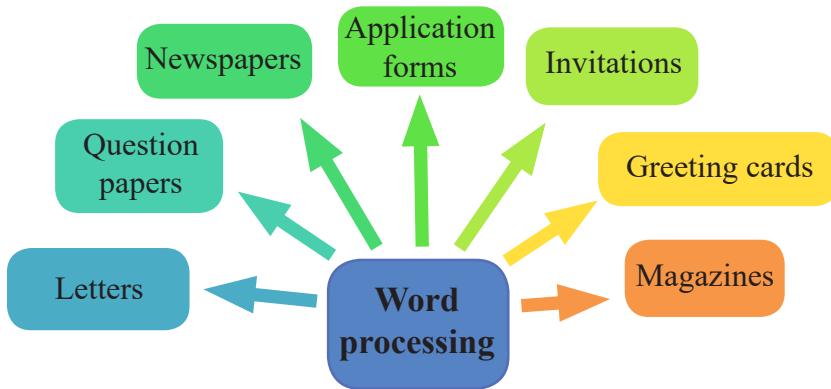
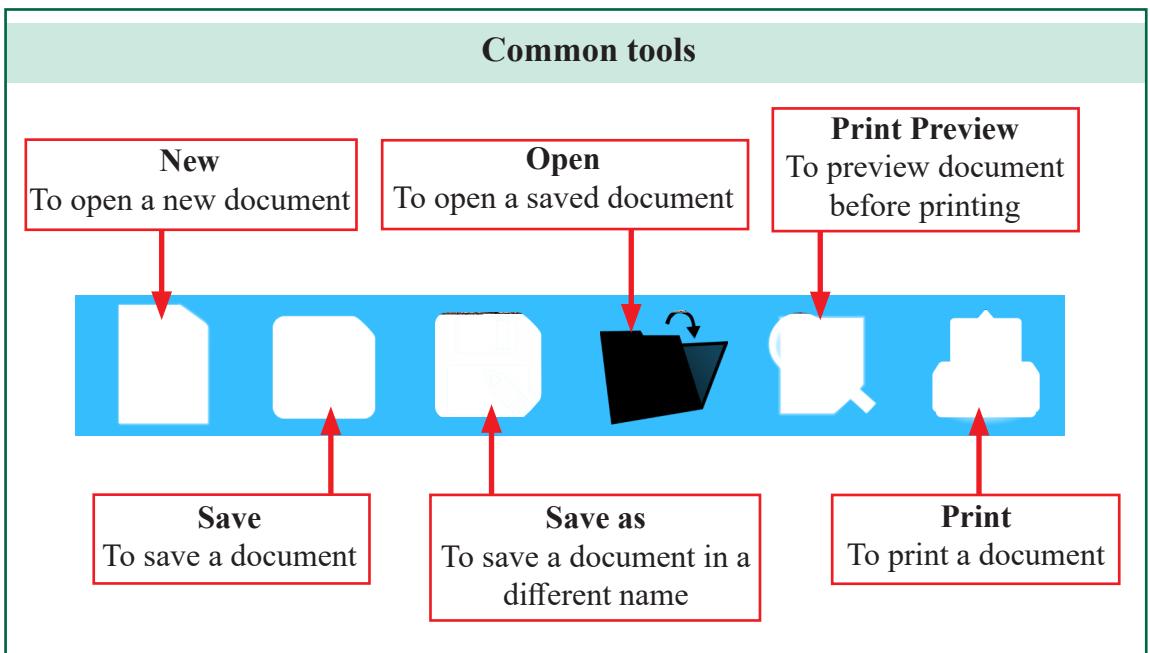
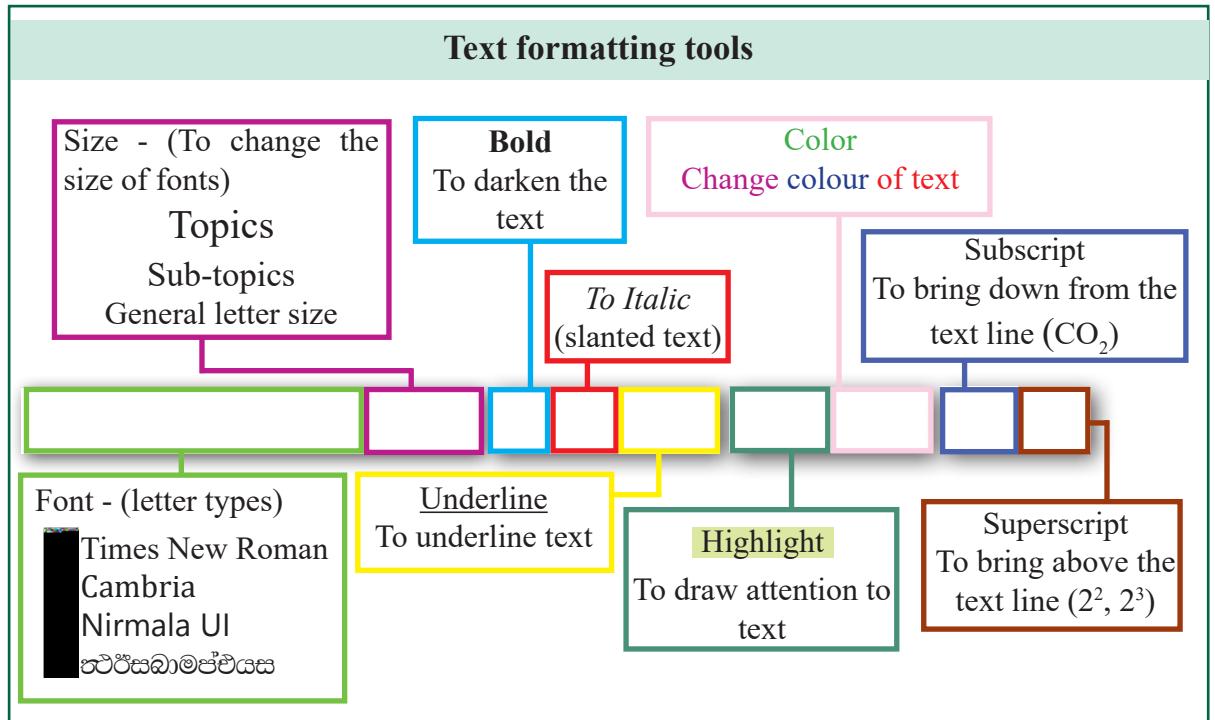
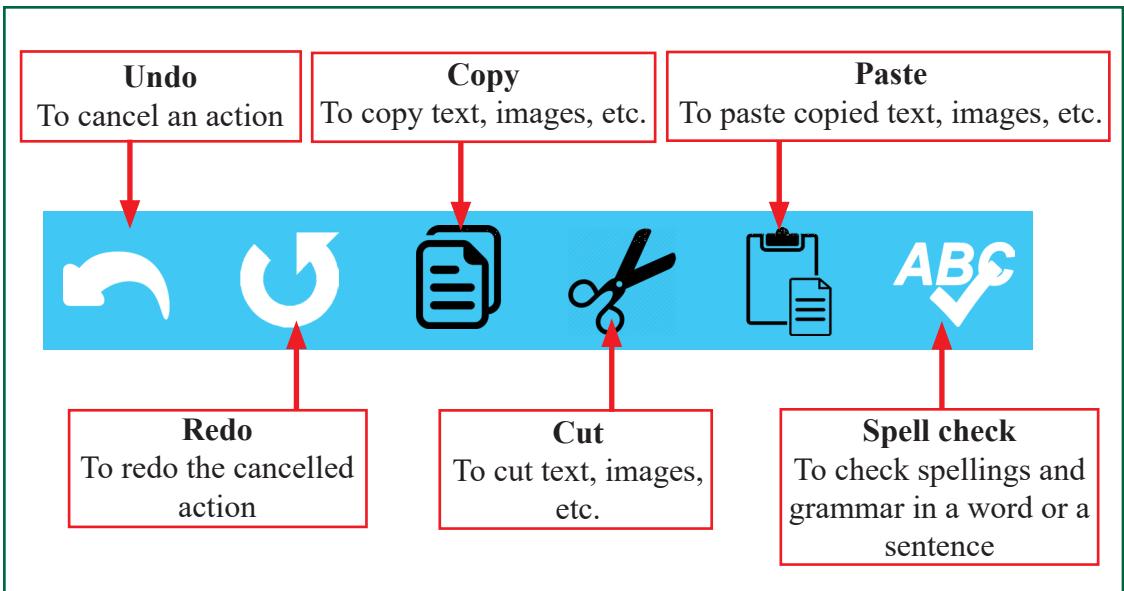


Figure 3.1 : Some documents that can be produced by using Word Processing software

There are many tools for creating documents using Word Processing software. Some of them are shown below;





Alignment and positioning tools

Align Left

To align the text to the left side

Align Right

To align the text to the right side

Line and Paragraph Spacing

To change spaces among lines and paragraphs

Shading

To colour the background



Center

To align the text to the middle

Justify

Align the text on both sides

Bullets

Numbering

Refer to workbook for Activities 3.1, 3.2, 3.3, 3.4 and 3.5

Insert objects

Pictures



Shapes



Text boxes



Clip Art - To insert images

Word Art - To insert artistic letters

Tables

Refer to workbook for Activities 3.6, 3.7, 3.8, 3.9 and 3.10

Summary

- Letters, magazines, certificates, application forms and many other documents can be prepared using *Word Processing Software*.
- Commonly used tools in Word Processing are: *New, Open, Save, Print, Print preview, Redo, Undo, Cut, Copy, Paste, Spelling and grammar*.
- *Size, Color, Bold, Italic, Underline, Highlight, Font, Superscript, Subscript* etc. are tools that can be used to format letters, words and sentences, etc.
- *Left Align, Center, Right Align, Justify, Bullets, Numbering, Spacing, Shading* etc. are tools to align text in a document.
- *Pictures, Tables, Shapes, Text boxes, Clip Art and Word Art* are some other features that can be added to document.

4

Programming

This chapter will cover the following:

- Analyzing problems
- Control structures
- Providing solutions to day-to-day problems
- Developing programs using *sequence* and *selection* control structures
- Applications of mobile and smart devices.

4.1 Problem analysis

Analyzing a problem involves dividing the problem into smaller segments of the problem and examine. This will make it easier to solve the problem.

For example, let us consider an invoice issued by a stationery shop.

To calculate the price (amount) of each item, number of items and unit price are required. The items required to prepare the invoice, are called **input**. Calculating the total price for each item and the value of total bill is known as **processing**. Price (amount) for each item and total bill value are known as **output**.

Hence, let us analyze the above bill and identify input, process and output.

Invoice			
ABC Bookshop process			
Date -			
Item	Amount	Unit price	Price
200 pages	1	150.00	150.00
80 pages	4	55.00	220.00
Carbon pens	3	15.00	45.00
Total			415.00

Input Outputs

Input :	Item description, number of items, unit price
Process :	For an item purchased;
Amount	= number of items \times unit price
Total bill	= total price (amount) of all items purchased

Output : A mount to be paid

In order to develop a computer program, it is essential to identify the *inputs, process and outputs* by analyzing a problem. (see figure 4.1)

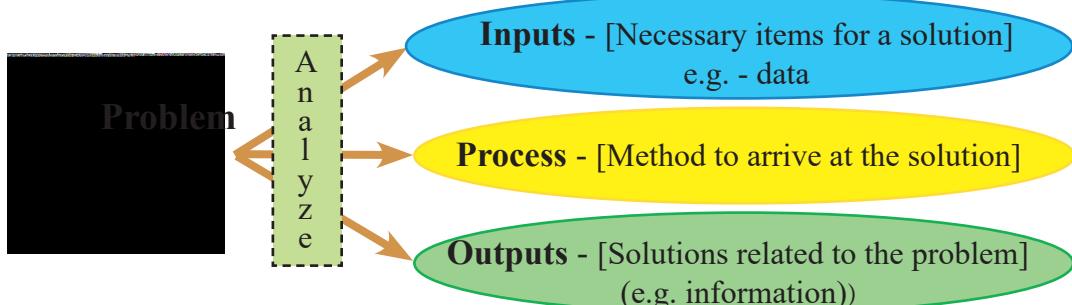


Figure 4.1 : Problem Analysis



Note - The problem needs analyzing before developing computer programs.

When analyze a problem, it is possible to identify *inputs, process and outputs*.

Example 1

Problem :	Find the year of birth when a person's National Identity Card number is given.
Input :	National Identity Card number
Process :	Select the first two digits in the identity card number
Output :	Year of birth

987654321V

Example 2

Problem :	Find the cost of purchasing five pens
Input :	Price of a pen
Process :	Calculating cost (total = price of a pen \times 5)
Output :	Total amount

Rs xx

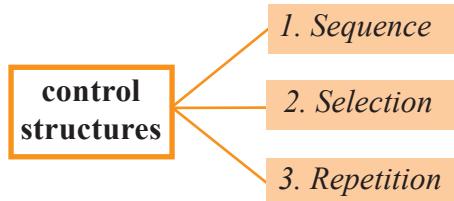
Figure 4.2 : Pens

Refer to workbook for Activity 4.1.

4.2 Control structures

A control structure is a block in a program that analyses variables and chooses a direction of flow of the program.

You have learnt in chapter five of Grade 7 book that there are three types of control structures as *sequence*, *selection* and *repetition*.

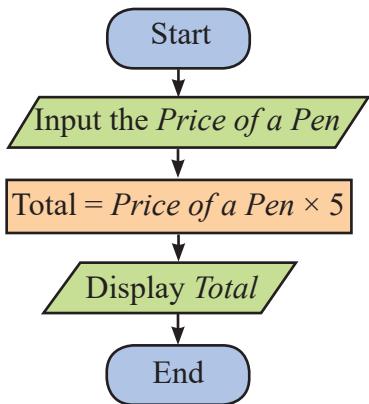


Note - In inputs and outputs are denoted by the symbol and the processes are by .

4.2.1 Sequence

If the steps are carried out one after the other from the beginning to the end in a particular consecutive order, it is called a *sequence*.

The flowchart and the Scratch program below is equivalent to the Example 2 in page 40.



Scratch program 1: find the cost of 5 pens when the unit price is provided

Flowchart 1 : finding cost of five pens

The price of the pen is shown by the *price_per_pen* variable and the amount to be paid is shown by the *Total* variable.

4.2.2

Selection

Selection decides which step(s) are executed depending on whether a condition of an algorithm is satisfied or not.

For example, consider a rainy day. If it rains students are asked to go to the library. If it does not rain, students are asked to go to the playground.

The decision box in flowcharts, is used to show the selection control structure (See Figure 4.3). If the condition is true, it is directed towards "Yes". If it is false, it is directed towards "No". The following symbol is used To indicate the decision making;

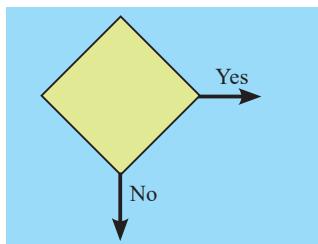
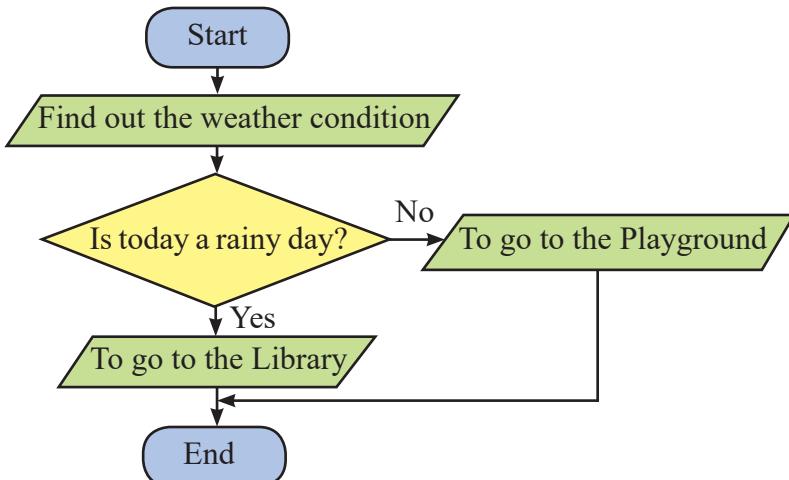


Figure 4.3 : Control structure



Figure 4.4 : Decision on whether it is a rainy day or not

Example 1 Indicate the above example in a flowchart.



Flow chart 2 : Going to the playground or the library according to the weather condition

Example 2 | Making decisions when playing Snakes and Ladders Game

Snakes and Ladders is a popular game that can be played by an individual or by a group of players. In this game, there are number of boxes from beginning (1) to end (36). Each *ladder* and *snake* has two boxes connected at ends (Refer figure 4.5).

Each time the dice is tossed, the following instructions are to be followed;

1. Check the number shown on the top face of dice.
2. Shift the counter to face by the number shown on the top face of the dice.
3. If the counter reaches the bottom of a ladder, move it to reach the top of the ladder.
4. If the counter reaches the head of the snake, move down to where the tail is.

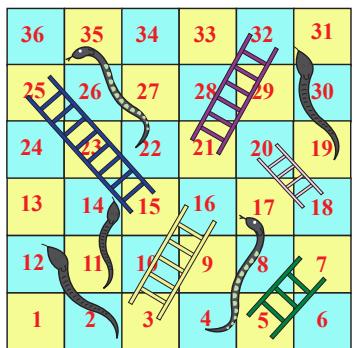
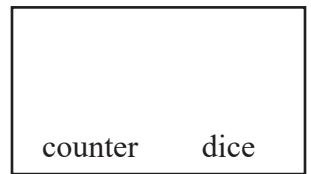
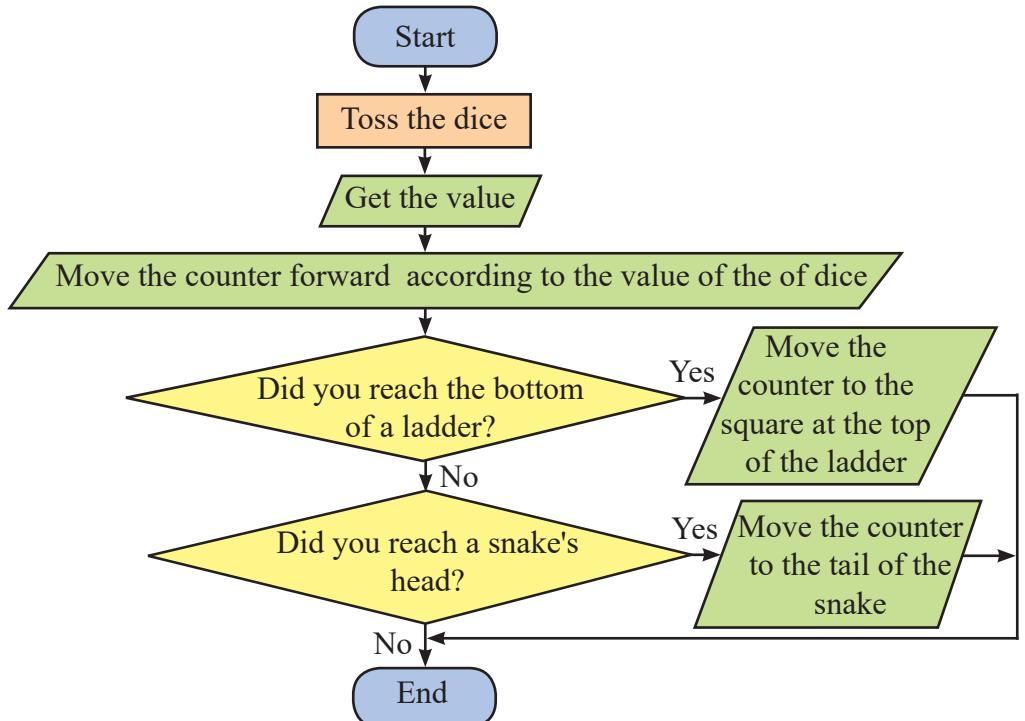


Figure 4.5 : Snakes and Ladders Board



One has to follow these conditions and reach square 36 to become the winner.

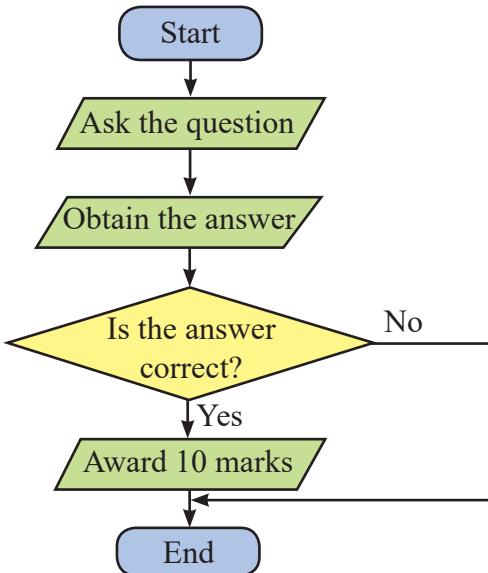
Given below is the flowchart relevant to the above example.



Flowchart 3 : Snakes and Ladders game

Example 3 Consider a scenario where 10 marks are awarded to the correct answer.

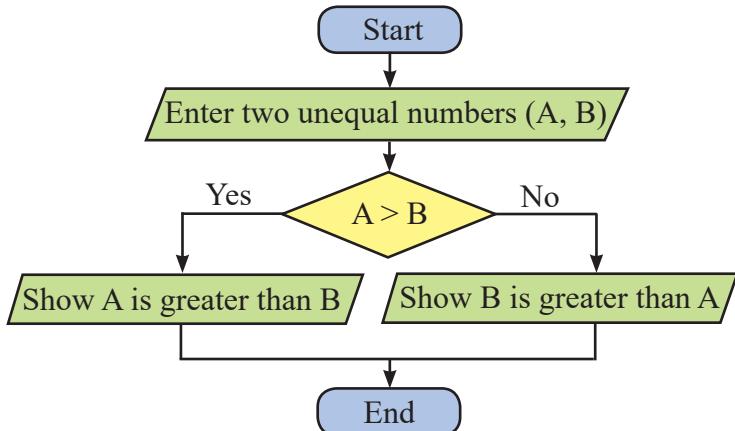
Before marks are awarded, it must be checked whether the answer is correct or wrong. If the answer is correct, 10 marks are awarded. Incorrect answers are awarded no marks. The above scenario can be represented by the following flowchart and control structures (Refer to Flowchart 4).



Flowchart 4 : Offering/Not offering marks for correct/incorrect answer

Example 4 Considering the scenario of finding the larger number from two unequal numbers.

Two numbers are given as input. Then the two numbers are compared. If the first is greater than the second, the output shows as the first number is greater. Otherwise, the output shows as the second number is greater (Refer to flowchart 5).



Flowchart 5 : Finding greater number

 Note - You will learn about the repetition control structure in Grade 9.

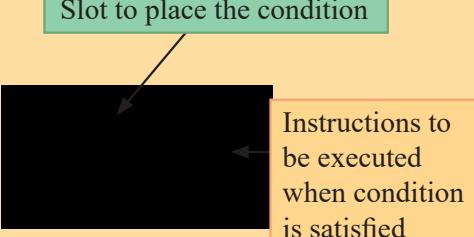
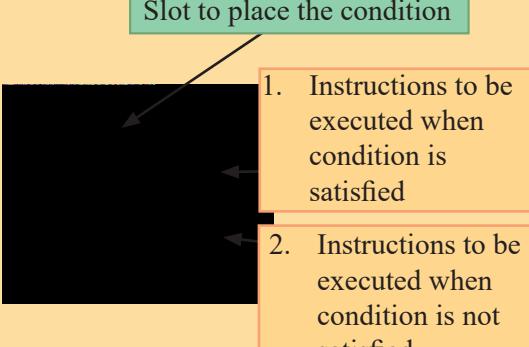
4.3 Selection control structures

Scratch is an Open Source Visual Programming Language produced to make programming easier to learn. Games, music, animations, interactive stories, etc. can be created using Scratch. Basic knowledge about Scratch was provided in the Grade 7 textbook.

Two types of selection control structures can be used in developing Scratch programs;

1. IF... THEN instructions block
2. IF... THEN... ELSE instructions block

Table 1 : Selection control structures

IF... THEN block	IF... THEN... ELSE... block
 <p>Slot to place the condition</p> <p>Instructions to be executed when condition is satisfied</p>	 <p>Slot to place the condition</p> <p>1. Instructions to be executed when condition is satisfied</p> <p>2. Instructions to be executed when condition is not satisfied</p>
Instructions are executed only if the condition is satisfied.	The first instruction block is executed when the condition is satisfied. The second instruction block is executed when the condition is not satisfied.

Comparison blocks

There are instances where a decision has to be taken after comparing two values in programming. The decision is taken after comparing the two values; whether one value is greater/smaller/equal than other value.

Instruction blocks shown in the following table are used to compare values. These blocks output "True" or "False" after comparison.

Table 2 : Comparison blocks

Instructions	Example	Output
Check whether the value on the left is smaller than the value of the right		True
		False
Check whether the value on the left equals to the right		True
		False
Check whether the value on the left is greater than the one on the right		True
		False



Refer to workbook for Activity 4.4

Instruction with logical blocks

The following instruction blocks are used to combine comparison instruction blocks. There are three types of logical blocks as follows;

1. AND

2. OR

3. NOT

Table 3 : Logical blocks

Instruction	Example	Reply
	 	True False
	 	True False
	 	True False



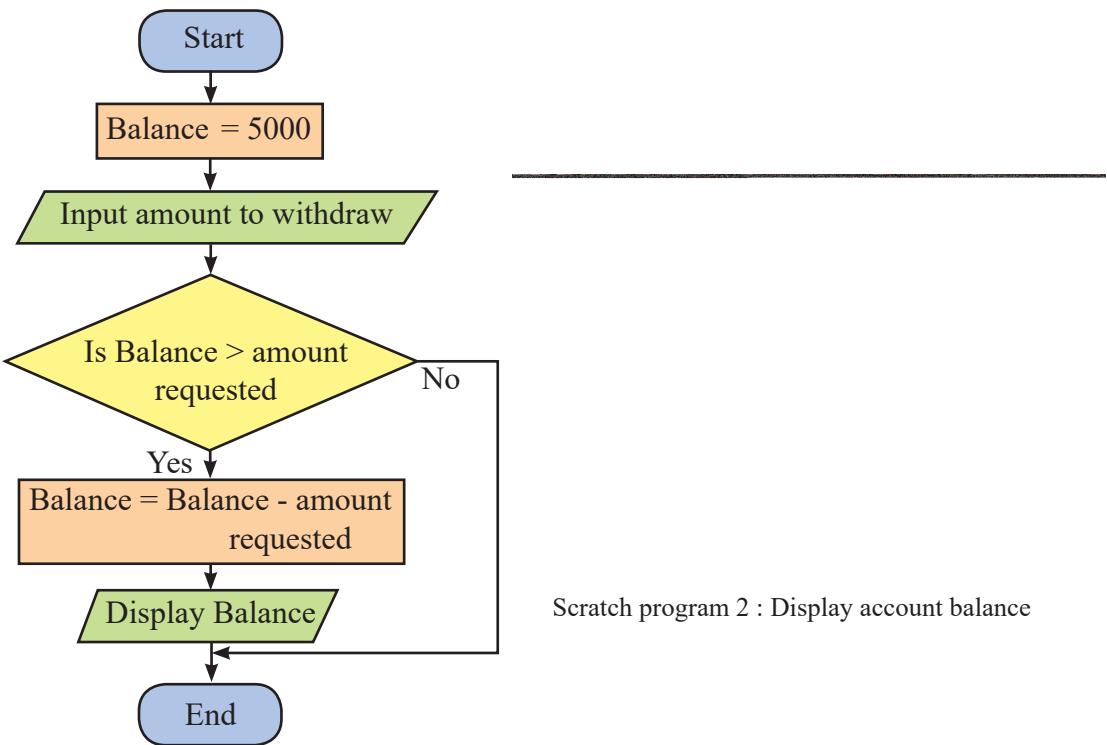
Refer to workbook for Activity 4.5

4.3.1

Developing Scratch program with selection control structure

Example 1 Display current balance after a withdrawal from an account with Rs.5000/=

In withdrawing money from an account, the current balance is first checked. Money is released only if the current balance is greater than the amount requested. The amount withdrawn is deducted from the current balance (Refer to Flowchart 6 and Scratch program 2).



Flowchart 6 : Display account balance

Example 2 Display whether an input number is odd or even.

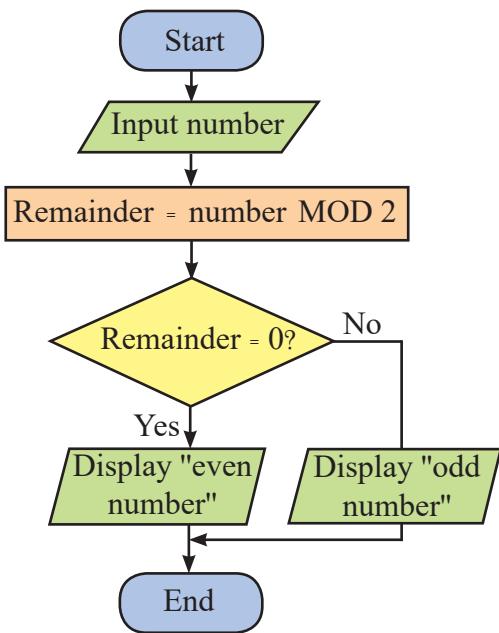
Mathematical operator MOD is used to determine the remainder when a number is divided by another. For example, 13 MOD 5 is 3. When 13 is divided by 5, the remainder is 3.

$$\begin{array}{r} 2 \\ 5 \overline{)13} \\ \underline{-10} \\ 3 \end{array}$$

13 MOD 5 = 3

remainder

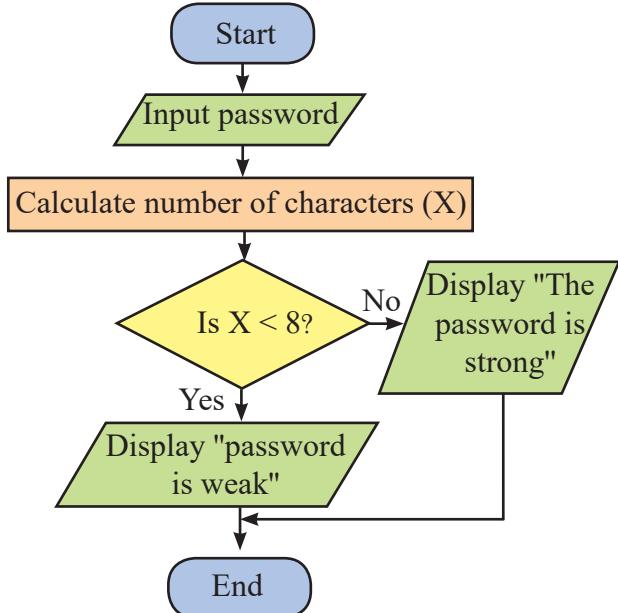
Accordingly, if a number is divided by 2 and the remainder equals 0, it is an even number. If the remainder is 1, it is an odd number.



Scratch program 3 : Test whether a number is even /odd

Flowchart 7 : Test whether a number is even/ odd

Example 3 The number of characters in a password is one of indicators of strength. If the number of characters is less than 8, it is a weak password. If it is more than 8, it is a strong password (see Flowchart 8 and Scratch program 4).



Scratch programming 4 : Display whether a password is weak or strong

Flowchart 8 : Display whether a passwords is weak or strong

The Scratch program for *Snakes and Ladders* game is given below; (Refer to Scratch programs 5)

1 →

2 →

3 →

4 →

5 →

6 →

7 →

8 →

9 →

Scratch program 5 : Snakes and Ladder game

Analysis of the program

1. Click on  to start.
2. First, display "Toss the dice".
3. Ask "What is the value?" and get the answer.
4. Assign the value obtained in step 03 above to the variable.
5. Declare 4 seconds to bring the counter forward according to the value of the dice.
6. Obtain "Yes" or "No" answer for the question, "Did it land at bottom of ladder?"
7. If the answer is "Yes", then move the counter to the square at the top of the ladder.
8. Display, "Did the counter come to the head of a snake?"
9. If the answer is "Yes", then move the counter to snake's tail.

Refer to workbook for Activities in 4.6, 4.7, 4.8 and 4.9

4.3.2

Applications for mobile and smart devices

Mobile and smart devices

Various applications are available for mobile and smart devices. These applications usually carry out tasks accurately and efficiently. Each mobile and smart device is developed for a specific function and they can be used according to the user requirements (See Figure 4.6).

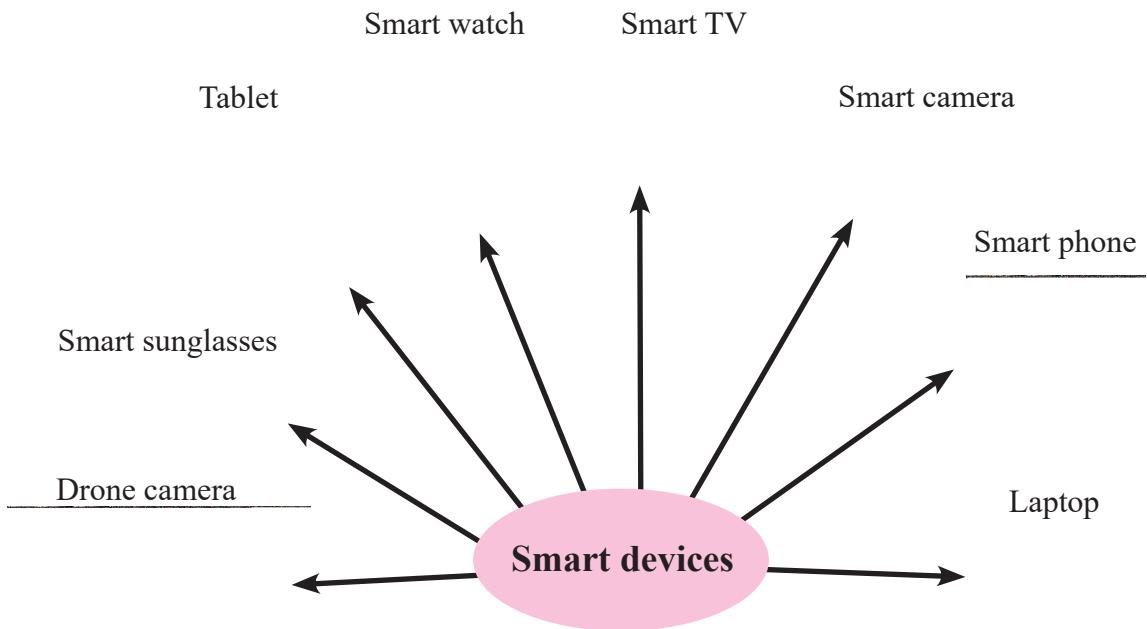


Figure 4.6 : Examples of mobile and smart devices

Tablets and laptops are widely used as general purpose machines. Other devices are meant for a specific functions. Therefore, it is necessary to determine whether the selected mobile device suits the intended purpose.

Table 4 : Smart devices and applications

Mobile device	Examples of use
Laptop computer	As a mobile device for general computer applications
Tablet computer	To surf the Internet and to take photos, etc.
Smart mobile phone	Telephone conversations, SMS and MMS messaging, taking photos, recording audio and video clips, surfing Internet, sending e-mails, etc.
Smart television	Managing and recording television programmes, e-mail and Internet
Smart camera	Taking photos, recording audio/video clips and sending them to other smart devices
Smart wristwatch	Displays time, sends SMS, sets alarm, accesses the Internet, etc.
Mobile spectacles	Watch scenery in 3D form, listen to audio, taking photos, record video clips, etc.
Drone camera	A remotely controlled, mini helicopter used to obtain aerial pictures or videos

Applications of mobile and smart devices

Many application software for mobile and smart devices are available on the Internet. Some application software can be downloaded free of charge while others have to be purchased. These downloaded software can be used after installing in the smart devices. The following shows some examples for application software for mobile and smart devices. (See Figure 4.7)

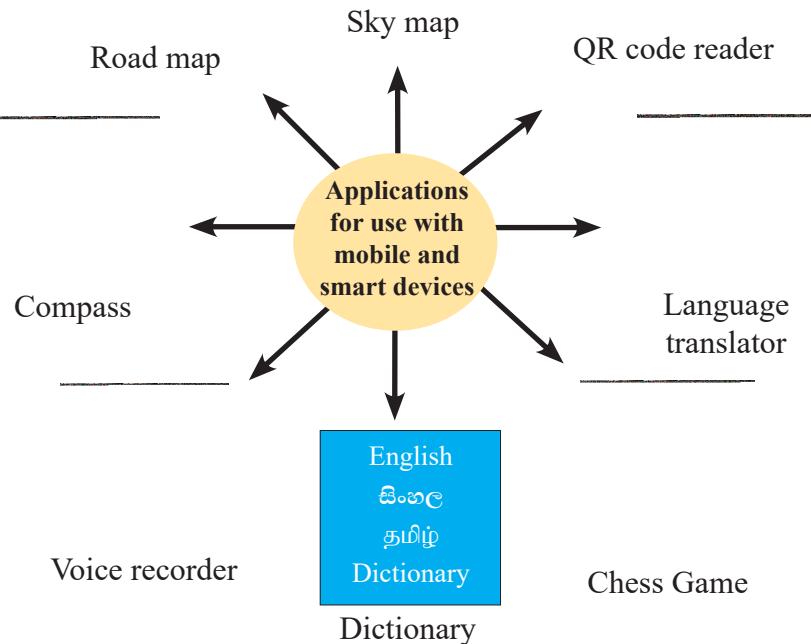


Figure 4.7 : Examples of the applications of mobile and smart devices

Table 5 : Mobile and smart devices and their uses

Smart device	Examples of use
Compass	finds the orientation
Route map	directs using GPS (finding routes), finds distance between two places, identifies traffic, etc.
Sky map	points the smart device towards a star or planet on the sky and see the details such as name, location, etc.
QR Code Reader	obtains information by scanning the QR code
Language translator	translates text in one language to another
Chess game	computer play as the opponent of Game
Sinhala dictionary	finds English term for Sinhala
Tape recorder	records and playback sound

Refer to workbook for the Activity 4.10

Summary

- Computer programs are developed to accept input, process data and produce output. Generally, the algorithm is written first and then the algorithm is converted to a program.
- There are three types of control structures that can be used in an algorithm;
 1. Sequence
 2. Selection
 3. Repetition
- A sequence follows steps in the algorithm one after the other.
- In selection, the program selects the course of action based on whether condition is satisfied or not. Scratch programming uses "if then" and "if then else" control structures for selection.



- Scratch uses three types of comparison blocks.
- Scratch uses three types of logical blocks.
- The "Repetition" control structures, will be taught in a future lesson.

This chapter will cover the following:

- Basic logic gates
- Use of software to identify a logic function
- Constructing simple circuits using logic gates
- Showing the functions of logic gates by using them practically



5.1 Basic logic gates

There are three basic logic gates as AND, OR and NOT.

AND Gate

Let us consider the following analogy to understand function of the AND gate.

The following diagram of a water tank in a house is to fill water without overflowing. Two valves are used to prevent water waste.

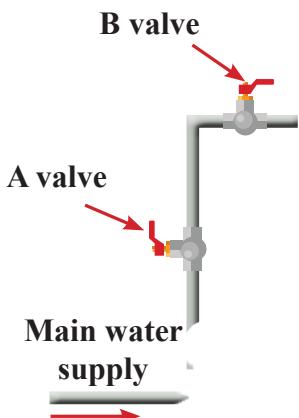


Figure 5.1 : Analogy for AND gate

The following table shows whether the tank receives water or not from the main supply based on whether the A and B valves are closed or open. (Table 5.1)

Table 5.1 : Water supply by valves A and B

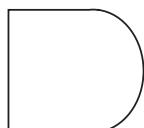
A valve	B valve	Water supply to tank
Closed	Closed	does not receive water
Closed	Open	does not receive water
Open	Closed	does not receive water
Open	Open	receives water

The following table using 1 for ‘open’ state, 0 for ‘closed’ state, and 1 for ‘receives’ state and 0 for ‘does not receive’ state (See Table 5.2).

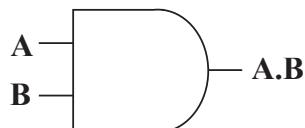
Table 5.2 : Indicating water supply by 0 and 1

A valve	B valve	Water supply to tank
0	0	0
0	1	0
1	0	0
1	1	1

The table above indicates whether the valves supply water or not. Similarly, the AND gate decides whether an electric signal is present or not. Availability of an electric signal is shown by state "1" and the unavailability is by state "0".



The standard symbol for AND Gate



When A and B are inputs

Inputs of a Gate is shown in capital letters. The output of AND gate is denoted by $A \cdot B$ when inputs are A and B.

The following truth table shows the function of the AND gate.

Input		Output
A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

In order to obtain the output 1, both inputs should be 1 in an AND gate.

OR Gate

Let us consider the following analogy to understand the function of the OR gate. As shown in the illustration below, the house has a water tank in addition to the regular main water supply. The tank is to ensure uninterrupted water supply. There are two valves A and B. (See Figure 5.2)

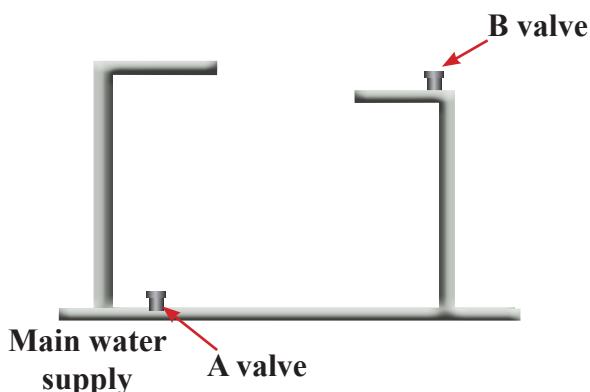


Figure 5.2 : An analogy for OR gate

The following table shows if the house receives water or not based on whether A and B gates are open or closed.

A valve	B valve	Water supply to house
Closed	Closed	does not receive water
Closed	Open	receives water
Open	Closed	receives water
Open	Open	receives water

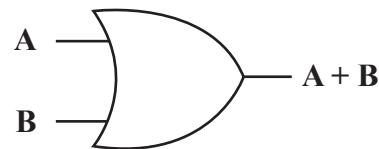
When the above table is replaced with value 1 for "open" state, 0 for closed state, 1 for receives state and '0' for "does not receive" state;

A valve	B valve	Water supply to house
0	0	0
0	1	1
1	0	1
1	1	1

The valves used in the above water tank control the supply of water to the house. Similarly OR gate controls the availability and unavailability of electric signal in a circuit. The availability of an electric signal is shown by '1' state whereas '0' state indicates the unavailability.



The standard symbol of the OR Gate



When A and B are inputs

The illustration above shows OR Gate as it appears on circuits. When A and B are inputs, output of OR gate is $A+B$. Truth table related to OR Gate is as follows;

A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

Output of OR Gate is state '1' when at least one input is in '1' state.

NOT Gate

Let us consider the following analogy to understand the function of NOT gate. It shows a street with street lamps that are switched off during day time and switched on at night.

Figure 5.3 : Lighting street lamps automatically

Sunlight	Electric lamp
available	OFF
unavailable	ON

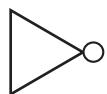
Consider state '1' as there is day light and state '0' as there is no day light. Street lamp's OFF state as 0, and 'ON' state on as 1.

Sunlight	Electric lamp
1	0
0	1

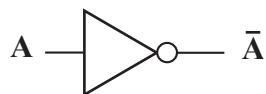
The output of the NOT gate is the opposite of its input.

Input	Output
receives day light	bulb OFF
receives no day light	bulb ON

The symbol of NOT gate is as follows;



Standard Symbol of NOT gate



When A is its input

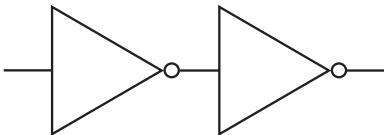
The above illustration shows a NOT gate in an electric circuit with A as input and \bar{A} as output. The equivalent truth table is as follows;

A	\bar{A}
1	0
0	1

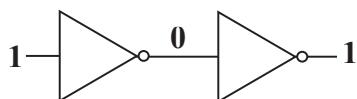
A particular voltage is shown by state 1 and another voltage is shown by state '0'.

Connecting logic gates in circuits

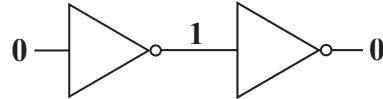
e.g.1 - Obtaining output from the circuit below where input is 1 or 0.



When input is 1

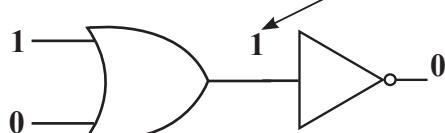


When input is 0



e.g. 2 - Obtaining the relevant output according to the input given.

In OR gate, the inputs are added to give the output ($1 + 0 = 1$)



Refer to workbook for Activities 5.1, 5.2, 5.3 and 5.4

Note - Logic Gates

1. The basic building block of Central Processing Unit (CPU) and other electronic devices and computers are logic gates. The basic function of the CPU uses logic gates.
2. Digital signals are used in digital computers. The significance of digital signals is that it has one value out of two, at a particular point in time (See Figure 1).



Figure 1 : Digital signal

3. Logic gates take digital inputs and provides digital outputs. The digital inputs and outputs take binary values. That means, the input and output are available only in one form of two states as 0 or 1.
4. Binary values can be represented using different methods. The most common method of representing is 0 and 1. They can also be shown represented as TRUE/ FALSE or HIGH/ LOW. In computer hardware, they are voltage values with 5V and 0V (See table 1).

Table 1 : Methods of representably binary values

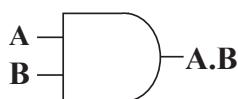
1	0
HIGH	LOW
True	False
5 V (volt)	0 V

5. Computer uses AND, OR and NOT logic gates to process data. Logic gates take states 0 or 1 as input and produce 0 or 1 states as output.

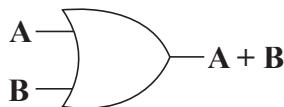
Summary

Basic logic gates

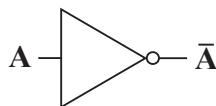
1. AND
 2. OR
 3. NOT
- Inputs given to those gates produce relevant output.
 - Function of AND gate



- Function of OR gate



- Function of NOT gate



This chapter will cover the following:

- Search engines
- Use of the Internet and explore for information
- Creating web pages
- Developing websites



6.1 Search engines

Search engines can be used to find information, images, videos, etc. on the Web. (See Figure 6.1)



Examples for search engines

Figure 6.1 : A few main search engines

Use of Internet to explore information

Different methods can be used to explore the Internet for information. A few of them are as follows:

Search engines

Search engines help find websites. Typing the keyword on the "Search" box and pressing the 'Search' button, display a list of websites that are relevant to the key words.

Browsing history

Search engines save recently used web addresses.

These websites can be accessed using the 'History'.

Bookmark/Favourite

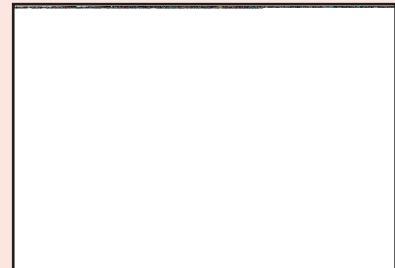
A click on bookmark/favourite helps save web addresses (URL) used often.

Saved websites as such can be seen as a list so that the required website can be accessed.

Hyperlinks

A hyperlink on web page links to another section of the same page or a different web page.

A text with a hyperlink has an underline and display in color. The mouse over a hyperlink shows icon of a hand.



Forward/ Backward

The Forward/Backward button helps navigate to a previous page or next page.

The forward/backward button appears on the top left corner of the web browser

Forward Backward

Tabs



A number of web pages can be opened in a single window of a web browser. They are called as Tabs.

When web pages are opened as tabs, it is easy to select pages.



Refer to workbook for the Activity 6.1.

6.2 Creating a web page

Some factors that should be considered in developing a web page are listed below;

1

- What is the goal of web site?
- Who uses it?

2

- Layout and structure of the size

3

- ★ Design
 - Use of colours, letters and font size
 - Clarity and readability of the content

4

- ★ Navigation
 - How does the user navigate the website?
 - Navigation to other websites

5

- ★ Use of images
 - Suits to user
 - Compatible with content
 - Minimal use of images

Main features necessary to create websites

Tool
There are several tools that can be used to develop web pages.

Software
Examples for some software that can be used to create web pages using HTML Notepad, NetBeans, Microsoft Visual Studio Community, Word Press, Bluefish, Eclipse

Tags/Elements
<ul style="list-style-type: none">HTML tags are used to create web pages.A tags/element is shown with the angular brackets <>.Most Tags have a start and an end.

A few tabs used in HTML to create a website and their functions:

<html>...</html> Indicate that HTML is used to create the web page

<head>...</head> Container for all head elements such as title of document.

<title>...</title> Title of the website (not included in the web page)

<body>...</body> To the content of the web page

<h>...</h> headers (titles)

... bold face text

<i>...</i> italicize text

<centre>...</center> center alignment

... a list with bullets

... a list with numbers

... bullet/ numerical list items

**
** line break

<p> a paragraph

**** Insert an image

... create a hyperlink

<title>...</title>

<h>...</h>

Wonderful Benefits of Banana

<i>...</i>

<p>

*Adding a banana to your daily diet has an array of benefits in
your body.*

Bananas helps

...

- 1. *loss of weight*
- 2. *keep your bowels healthy*
- 3. *provide nutrients that regulate heart rhythm*
- 4. *have vitamin compounds for eye health.*

...

Bananas provide a variety of vitamins and minerals:

...

- Vitamin B6 - 0.5 mg.
- Manganese - 0.3 mg.
- Vitamin C - 9 mg.
- Potassium - 450 mg.
- Dietary Fibre - 3g.
- Protein - 1 g.
- Magnesium - 34 mg.

[More about bananas](#)

...

Refer to workbook for Activities 6.2, 6.3, 6.4, 6.5, 6.6 and 6.7

Summary

- Search engines are used to find information from the web sites on Internet.
- Google, Yahoo, bing, Ask, MSN are examples for search engines.
- History of the web surfing and bookmarks also help gather information.
- Hyperlinks, forward and backward buttons and tags are used to navigate among web pages and web sites.
- The goal, the users, arrangement and structure, etc. are to be considered in developing a web state.
- Tools, software, HTML tags are used in developing a web page.

ஓங்குசிச்-கிள்-லெட்டர்-டெம்மெல் பாரிசாபீக் கல்வி மாலாவு.

No	ஓங்குசிச்	கிள்-லெட்டர்	டெம்மெல்
1.	abstract model	விழுக்கை அகாந்திய	கருத்தியல் மாதிரி
2.	acceptance testing	பிரதிகுற்று பரிசீலனை	ஏற்புச் சோதனை
3.	access privilege	பிலேஜீலீ வரப்பூட்டுதல்	அணுகல் உரிமை
4.	agile model	குவிலங் அகாந்திய	சுறுசுறுப்பு மாதிரி
5.	alternate key	லீகல்கீ யதூர்	மாற்றுச் சாவி
6.	American Standard Code for Information Interchange (ASCII)	தொரநூர் ஒலிமூர்ஜல் கட்டுரை வீடு ஆமெரிக்கா ஸ்டாஷன் கீ என்ட்ராக்கான் அமெரிக்க நியம விதிக்கோவை	தகவல் இடைமாற்றுக்கான அமெரிக்க நியம விதிக்கோவை
7.	amplitude	லீக்கீநார்க்கை	வீச்சம்
8.	amplitude modulation	லீக்கீநார் மூர்க்கால	வீச்சப் பண்பேற்றம்
9.	analog	புதிகம்	ஒப்புமை
10.	anchor	ரெட்டிவும்	நிலை நிறுத்தி
11.	application layer	அனுப்பயேஞ் கீர்க்கை	பிரயோக அடுக்கு
12.	architecture	நிரமித்துக்கை	கட்டமைப்பு
13.	arithmetic and logical unit (ALU)	அங்க கணித கூடுதல் கீர்க்கை	எண்கணித மற்றும் தர்க்க அலகு
14.	array	அருவி	அணி
15.	artificial intelligence	கைதிம் இட்டிகை	செயற்கை நுண்ணறிவு
16.	Affective computing	இட்டிமன் கூட வீன்னலீக் கரிக்குத்துக்கை	நுண்ணறிவு உணர்த்திறங்கிக்க கணித்தல்
17.	associative law	கங்கள் கூடுதல்	கூட்டு விதி
18.	attenuation	விடுதலீம்/குடுக்குதல்	நொய்மை
19.	attribute	டிப்போக்கி /ஒலுகு / டிப்போக்குஒலுகு	பண்புகள்
20.	authoring tool	கமிபாடு மேவலம்	படைப்பாக்கக் கருவி
21.	Automated Teller Machine (ATM)	சீவியங்கள் மூடல் கூடுதல் கூடுதல்	தானியங்கிப் பணம் கையாள் இயந்திரம்

22.	autonomous	ස්වයංපාලක / ස්වතන්තු/ස්වායත්ත	සයාත්ත්නී
23.	axiom	ස්වසිද්ධිය/ප්‍රත්‍යක්ෂය	බෙඩිපපළේ ඉණ්මෙම
24.	backups	ලපස්ට්	කාප්පෙපුත්තල්
25.	bandwidth	කළුප පළමු/බඳස් පළමු	පට්ටේ අකලම්
26.	batch processing	කාණ්ඩ සැකසුම	තොරුති මුළුවයුතියාකකම්
27.	big data	මහා දත්ත	පෙරිය තරව
28.	binary	දෑව්ලය	තුවිතම්, මූළුම්
29.	binary coded decimal (BCD)	දෑව්ලය කේතික දැඟලය	මූළුමක ගුරුමුහුර ත්‍යෘත්මක
30.	bio-inspired computing	පෙළව ප්‍රෝට්‍රත පරිගණකය/ පෙළව අනුප්‍රෝට්‍රත පරිගණකය	ඉයිරියාල් ඉණ්ඩ්ප්‍රාක් කණිපු
31.	bit coin	බැඳු කාසි	රුජ්‍යක්තන් පණම් චෙවුත්තල්
32.	bitwise	බැඳු අනුසාරත	පිට බාරි
33.	bitwise logical operation	බැඳු අනුසාරත තාර්කික මෙහෙයුම්	පිට බාරි තර්කක් චෙයුත්පාටු
34.	black box testing	කාල මංඡ්‍යා පරීක්ෂාව	කරුප්‍යාපේට්ඩ්ස් සොතිප්‍ය
35.	blogging	වෛඩි සටහනය	වැළඳපාත්‍රිවිතල්
36.	boot-up	ප්‍රලේඛනය	තොටංගුත්තල්
37.	broadcasting	විකාශනය	තොලපරුප්පල්
38.	browsing	අතරක්සීම	මොලොටල්
39.	bubble sort	ඩිඩ්ල තේරම/ යා-සැසැලම් තේරම	ගුම්ඩි බැකප්පාත්තල්
40.	built-in	තුළබඳී / නිළැමි	ඉට්‌පොතින්ත
41.	business process re- engineering (BPR)	ව්‍යාපාර ක්‍රියාවලියේ ප්‍රති ඉංජිනේරකරණය	වැළඳපාත්‍රිවිතල් මීඳ්කට්තමෙපු
42.	candidate key	නිර්ජන යනුර	පිරතිනිතිත්තුවස් සාධී
43.	cardinality	ගණනීයතාව	ගණනීයතාව
44.	cathode ray tube (CRT)	කැනෙක්ඩ කිරණ නැලය	කොශාට්කුක කතිර් ගුෂාය්

45.	central processing unit (CPU)	முடிச செக்கிலுடி ஶீக்கை	மத்திய செயற்பாட்டு அலகு
46.	characteristics	கதி ஒக்ஷன் / ஸ்விளக்ஷன்	சிறப்பியல்புகள்
47.	check box	சிலைன் கோருவி	சரிபார்ப்புப் பெட்டி
48.	client-server model	கேவ்வா யேப்க-கேவ்வா டாயக் அகாதிய	சேவைப் பயனர் மாதிரி
49.	clock	க்ஷீப்புக்கை	கடிகாரம்
50.	cloud computing	விலைகுல் பருத்துக்கை	மேகக் கணிமை
51.	coaxial cable	சுமக்ஷன் கேவ்லரை	ஒரச்சு வடம்
52.	code editor	கேவ் சிங்கீரக்	குறிமுறை தொகுப்பி
53.	comment	வீவரங்கள்	விளக்கக் குறிப்பு
54.	commutative law	நாய்டேஞ் நாய	பரிமாற்று விதி
55.	compact disc	ஸ்ரீகங்கி சிங்கை	ஓளியியல் வட்டு
56.	compatibility	ஒழுப்பும்	பொருந்துகை
57.	compiler	சுமிபாடுகை	தொகுப்பான்
58.	component	சுமர்வுகை	கூறு
59.	composite key	சுமங்கேவ் கூரு	கூட்டுச் சாவி
60.	constant	நியநை	மாறிலி
61.	content management system (CMS)	அங்கேநை கலும்நைகர்ண பட்டியலை	உள்ளடக்க முகாமைத்துவ முறைமை
62.	context switching	சுதாரை ஸ்ரீவுகை	சந்தர்ப்ப நிலைமாற்றல்
63.	contiguous allocation	யாவிட வினாப்புகை	அடுத்தடுத்தான் ஒதுக்கீடு
64.	control structure	பாலுந விழுங்கை	கட்டுப்பாட்டுக் கட்டமைப்பு
65.	control unit (CU)	பாலுந ஶீக்கை	கட்டுப்பாட்டலகு
66.	credit card	நியபதி	கடன்டை
67.	customization	அகிரேவிகர்ணங்கள்	தனிப்பயனாக்கல்
68.	data	டாதீ	தரவு
69.	data and control bus	டாதீ சுத பாலுந பல்	தரவும் கட்டுப்பாட்டுப் பாட்டையும்

70.	database management system (DBMS)	டத்த கணிலாக கலூமனாகர்ண பட்டினி	தரவுத்தள முகாமைத்துவ முறைமை
71.	data definition language (DDL)	டத்த திருவின காலை	தரவு வரையறை மொழி
72.	data dictionary	டத்த கெடிட்கேஷன்	தரவு அகராதி
73.	data flow diagram	டத்த கெட்டில் சுவகன	தரவு பாய்ச்சல் வரைபடம்
74.	data flow model (DFM)	டத்த கெட்டில் ஆகங்கிய	தரவு பாய்ச்சல் மாதிரி
75.	data link layer	டத்த கெடிட்டி கீர்ய	தரவு இணைப்பு அடுக்கு
76.	data manipulating language (DML)	டத்த கைப்பாடு கீர்ய	தரவு கையாளல் மொழி
77.	data migration	டத்த பார்யவனய	தரவு பெயர்ச்சி
78.	debugging	திடூக்கி கிரிம்	வழு நீக்கல்
79.	decision support system (DSS)	தீர்ண கூடுதல் பட்டினி	தீர்மான உதவு முறைமை
80.	declarative	பொருத்துமிக	அறிவிப்பு
81.	default values	பேர்தில் அகய	இயல்புநிலை மதிப்பு
82.	defragmentation	பிரிவீசிநய	துணிக்கை நீக்கல்
83.	demodulation	வீழுரைஞய	பண்பிறக்கம்
84.	device	ஸ்ரைங்க / ஸ்ரைமிக	சாதனம்
85.	device driver	ஸ்ரைங் விவக மாட்காங்க	சாதனச் செலுத்தி
86.	digital	அங்கித	இலக்க முறை
87.	digital camera	அங்கித கைமருவி	இலக்கமுறைப் படக்கருவி
88.	digital economy	அங்கித ஆரைஞய	இலக்கமுறைப் பொருளாதாரம்
89.	digitizer	சிங்காங்ககய	இலக்கமாக்கி
90.	direct implementation	சென்றக்கீர்ய	நேரடி அமுலாக்கம்
91.	disk formatting	தகரை/கீசக கைவிசை கைநீரீம்	வட்டு வடிவமைப்பு
92.	distortion	வீகங்கிய	திரிபு

93.	distributive law	විශ්වන නොය	පංක්ටු විති
94.	document flow diagram	ලේඛන ගැලීම් සටහන	අුවණ්ප පායස්සල් බරෙපතම්
95.	domain	වසම	අුස්කණම්
96.	domain name server (DNS)	වසම් නාම සේවාදායකය	අුස්කණප පෙයර් සේවයකම්
97.	domain name system (DNS)	වසම් නාම පද්ධතිය	අුස්කණප පෙයර් මුහෘමය
98.	dynamic host configuration protocol (DHCP)	ගතික දාරක පාලන නියමාවලිය	මාරුම විරුන්තොම්පි ඉස්සමෙවු නෙත්‍රිමුහුර
99.	dynamic web page	ගතික වෙබ් පිටු	இயக்குநிலை வஸல்பக்கம்
100.	e-commerce	இண්‌சுத්‍ය வாනித்துக்கூடம்	மின் வர்த்தகம்
101.	economical feasibility	அரசிக் கைந்துவ	பொருளாதாரச் சாத்தியப்பாடு
102.	elementary process description(EPD)	මුළුக ක්‍රියාවලි විස්තரය	அடிப்படைச் செய்மුහුර விபரிப்பு
103.	e-market place	ஓ-வேலெ போல	இலத்திரனியல் சந்தை இடம்
104.	encryption	ஒர்த கேத்துக்கூடு	மුහුරகுறியாக்கம்
105.	enterprise resource planning system (ERPS)	ஒத்துப்பாடு கூடுதல் பகுதி	நிறுவன மூலவள திட்டமிடல் மුහුமை
106.	entity	ஐතார்தை/அதிஐதார்தை/ஐத்துவ	நிலைபொருள்
107.	entity identifier	ஐதார்தை/அதிஐதார்தை/ஐத்துவ	நிலைபொருள் அடையாளங்காட்டி
108.	entity relationship(ER) diagram	ஐதார்தை கூடுதல் தொகை	நிலைபொருள் உறவுமුහුர அட்டவணை
109.	executable	க්‍රියාත්මක කළ හැකි	இயக்கத்தகு
110.	executive support system (ESS)	විධායක සහාය පද්ධතිය	நிறைவேற்று உதவு மුஹුமை
111.	expert system	විශේෂඝ පද්ධතිය	நிபுணத்துவ மුஹුமை

112.	extended binary coded decimal interchange cod (EBCDIC)	විස්තරන දේලීමය කේතක දැනම	න්දිත්ත තුවිත කුරිමුරහ තසම මිටමාර්ඩක කුරි
113.	extended entity relationship (ER) diagram	විස්තරන ඉතාරේ සම්බන්ධිත රේප සටහන	විරිභාක්කප්පාට් නිලෙපොරුණ මූල්‍යමුරහ අට්ටවණෙ
114.	feasibility study	ශක්තා අධ්‍යයනය	සාත්තියප්පාට් කරුණක
115.	feedback loop	ප්‍රතිපෝෂණ ලුපය	පින්නුටුට්ල බණ්ඩයම්
116.	fetch-execute cycle	අහරණ-කිගාකරවුම් විකුරය	තරුවිප්ප නිශ්ච්‍යවෙශ්‍රුස් සමුර්ශී
117.	fiber optic	ප්‍රකාශ තන්තු	මිශ්‍ය ඉණියියල්
118.	file	ගොනුව	කොප්පු
119.	file hierarchy	ගොනු ඔරුවලිය	කොප්පු පැඳ්‍යාලෙ
120.	firewall	හේතු පවුර	ත්ස්ස්වර්
121.	normal form	ප්‍රථම ප්‍රමත අවස්ථාව	මියල්පාක්කල බාධ්‍යම
122.	fixed internal hard disk	අවශ්‍ය අන්තර් දැක් තැවී	නිලෙයාන මැණ්ඩාල බණත්ටාටු
123.	flash memory	සිතුව / ක්ෂේත්‍රීක මතකය	පැවිස්සිට්ටු නිශ්ච්‍යවකම්
124.	flash memory card	සිතුව / ක්ෂේත්‍රීක මතක පත	පැවිස්සිට්ටු නිශ්ච්‍යවක අට්ටෑ
125.	flat file system	වේක ගොනු පද්ධතිය	සමතාක් කොප්පු මුරහමේ
126.	flip-flop	පිළි-පොල	සුළු-විශු
127.	float	මුදුලිම/මුප්පිලිම	මිත්වෙ
128.	floppy disk	නම් තැවීය	නෙකිම් බට්ටු
129.	flow chart	ගැලීම් සටහන	පාය්ස්සර් කොට්ටුප්පතම්
130.	folder	ගොනු බහුලම	කොප්පුරෙ
131.	foreign key	අගන්තුක යෙුර	ආන්ත්‍රිය්ස්සාවි
132.	formatting	හැඩස්වී ගැන්වීම	වැඩවෘම්තත්ත්වා
133.	frame	රාමව	ස්ට්‍රාකම්
134.	frequency modulation	සංඛ්‍යාත මුර්පතනය	අතිර්වෙණ් පණ්ඩෝර්ඩල්

135.	full adder	ഇരുന്തുകളക്ക	മുമ്പെമക് കൂട്ടി
136.	function	ക്രിത്യ / കാർഡ	സാർപ്പി
137.	functional dependency	കാർഡ ദിംബ പരാങ്ങേന്നതാവി	ചെയല് സാർപ്പുനിലൈ
138.	functional requirement	കാർഡ ദിംബ അവക്ഷന്നാവി	ചെയല്പട്ട തേവൈ
139.	quantum computing	കേംബോംബി പരിഗണനക	ചൊട്ടു കணിപ്പി അടിപ്പട്ട
140.	gateway	ഡോർവ്വ മത / വാക്സൽ ഫോറാർ	നുമേഖവാധില്
141.	genetic algorithm	സഹജ ആൽഗോറിംഡം	മരപണ്ണി വழിമുരൈ
142.	geographical information system(GIS)	ഭൗഗോളിക നോർമൂര പദ്ധതിക /മിക്രോനേ നോർമൂര പദ്ധതിക	പുവിധില് തകവല് മുற്റൈമൈ
143.	graph plotter	പ്രസ്തുതാർ ലക്ഷ്യക്കരണക	പടവരൈപി
144.	graphic tablet	ശീതുകൾക്ക	വരൈവിധില് വിവരമാക്കി
145.	grid computing	പാലക പരിഗണനക	കോട്ടുച്ചെട്ടകക് കൺസിസ്റ്റ
146.	guided media	നിയമി മാദിഷ	വഴിപുത്തുപട്ട ഉണ്ടകമ്
147.	half adder	അർബാകളക്ക	അരൈ കൂട്ടി
148.	hand trace	ഹാൻഡുന്റേബനക	കൈക് സവുകൻ
149.	hard disk	ഡാക്ടി താരീയ / ഡിബ്ല ചീസ്ക്ക	വൺതട്ടു
150.	hardware	ഡിബ്ലാംഗ	വൺപൊരുൻ
151.	hexadecimal	ഒക്സി ദിജിറ്റല	പതിനെണ്ണുമും
152.	hierarchical model	ഘൂരാവലി ആക്ഷനിക	പാദ്ധനിലൈ മാതൃസ്ഥി
153.	host	സഹിക്കാർക	വിനുന്തോമ്പി
154.	hub	നൂൽക	കുവിയൻ
155.	human operator	മിക്രോക്കാർഡിലോ	മനിത ഇയക്കുപവർ
156.	hybrid approach	ഡെമൂളൻ പ്രവേശന	കലപ്പ അന്താകൾ
157.	hyperlink	അടിസമിബന്ധക	മേ ഇന്നെപ്പ
158.	Integrated circuits (IC)	അനുകലിത പരിപാല	ഓരുംകിഞ്ഞെന്ത സർപ്പ
159.	icon	നിരസനക	ചിത്ര പടമ്

160.	identity	கரீவகாமங்	அடையாளம்
161.	image	ரெப்ப	படிமம்
162.	imperative	வீடியாத்தீலக	கட்டடளை
163.	incremental	வரீவனத்தீலக	ஏறுமான, அதிகரிப்பு
164.	indexed allocation	அனுநிலக் வீகாசனம்	சுட்டி ஒதுக்கீடு
165.	information	தொற்றுரை	தகவல்
166.	inkjet printer	தீங்க வீட்டு இடைகய	மைத்-தாரை அச்சுப்பொறி
167.	instant messaging	க்ஷேதிக அணிவிச கைலீம்	உடனடிச் செய்தியிடல்
168.	integrated development environment(IDE)	கமேர்வாதிக கிஂவரை பர்சரம்	ஒருங்கிணைந்த விருத்தி சூழல்
169.	integration test	அனுகலன பரிக்ஷனம்	ஒருங்கிணைந்த சோதிப்பு
170.	intelligent and emotional computing	இட்டிமத் கண வித்தவீதி பரிசுநனம்	நுண்ணறிவும் உணர்திறனுமிக்க கணித்தல்
171.	interface	அறூர் மின்னு	இடைமுகம்
172.	internet service provider(ISP)	அந்தரைப்பால கேவுக் கிபயன்னா	இணையச் சேவை வழங்குனர்
173.	interpreter	அரிப்பீனாக்கம்	மொழிமாற்றி
174.	interrupt	அறூர் வீட்டும்	இடையூறு
175.	intranet	அந்த:பாலக / அந்தீ:பால	அகவிணையம்
176.	internet of things (IoT)	கூரவ டுவிஜ் அந்தரைப்பாலக / கிளைடி டுவிஜ் அந்தரைப்பாலக	பொருட்களின் இணையம்
177.	iteration	பூனைகர்ணம்	மீள் செயல்
178.	karnaugh map	கானோ சீதியம்	கானோ வரைபடம்
179.	knowledge management system(KMS)	டைஞ்சி கலைகாரன் பட்டிதிய	அறிவு முகாமைத்துவ முறைமை
180.	large scale integration (LSI)	வீகால பரிமானத்தீலை அனுகலனம்	பாரிய அளவு ஒருங்கிணைப்பு
181.	latency	பமால/ஒத்ததாவ	மறைநிலை

182.	least significant	அடிமேலேக்கீ	சிறும மதிப்பு
183.	legend	வீசீர பாரிய	குறி விளக்கம்
184.	life cycle of data	டித் தீவின வாழ்வு	தரவு வாழ்க்கை வட்டம்
185.	light emitting diode(LED) display	ஆலோக வீமோவக டிகேய்சி சுந்தரீக்கை	ஒளிகாலும் இருவாயித் திரை / ஒளி உமிழும் இரு முனையம்
186.	linked allocation	சுலை வீதாப்பகை	இணைப்பு ஒதுக்கீடு
187.	linker	சுந்திரகை	இணைப்பி
188.	liquid crystal display(LCD)	டிலைசுலீக சுந்தரீக்கை	திரவப்பளிங்குக் கணினித் திரை
189.	list	டைசீஷன்	பட்டியல்
190.	liveware	பீவாங்க	உயிர் பொருள்
191.	local publishing	சீர்திய பிஸீட் கிரம	உள்ளக வெளியீடு
192.	local area network (LAN)	சீர்திய பிள்ளை பாலக	இடத்துறி வசையமைப்பு
193.	logic gate	தூர்கிக ஢ிலாரக	தர்க்கப் படலை
194.	Logical Data Modeling(LDM)	தூர்கிக டித் அகஸ்திகரன்கை	தர்க்கத் தரவு மாதிரியிருவாக்கல்
195.	logical data structure	தூர்கிக டித் விழுகை	தர்க்கத் தரவுக் கட்டமைப்பு
196.	logical design tools	தூர்கிக சூலைக்கு மேவாடுமி	தர்க்க வடிவமைப்புக் கருவி
197.	looping	இப்பகை	வளைய வரல்
198.	machine code	யன்ற கேத்கை	இயந்திரக் குறியீடு
199.	machine-machine coexistence	யன்ற-யன்ற சுப்பைவின்மீ	இயந்திர- இயந்திர ஒருங்கிருத்தல்
200.	magnetic ink character reader(MICR)	முலிகித தீந்த அனு மகஞ் கீயவுகை	காந்த மை எழுத்துரு வாசிப்பான்
201.	magnetic stripe reader	முலிகித தீர் கீயவுகை	காந்தப்பட்டி வாசிப்பான்
202.	magnetic tape	முலிகை பரீகை	காந்த நாடா
203.	malware	அதிக்க மாட்காங்க	தீம்பொருள்

204.	management information system (MIS)	கலூமினாகர்ண நோர்னர் பட்டியல்	முகாமைத்துவ தகவல் முறைமை
205.	man-machine coexistence	மிகீஸ்-யனீஸ் சுப்பேவேஷன்	மனிதன் - இயந்திரம் ஒருங்கிருத்தல்
206.	media access control (MAC)	மாடிஸ பிளேசு பாலக	ஊடக அணுகல் கட்டுப்பாடு
207.	memory management unit(MMU)	மினக கலூமினாகர்ண லீக்கய	நினைவக முகாமைத்துவ அலகு
208.	mesh topology	ஓட்டி சீலிலகய	கண்ணி இடத்தியல்
209.	microprocessor	கீழ்க் கூக்கினய	நுண்செயலி
210.	microwave	கீழ்க் கர்க்க	நுண்ணலை
211.	mini disk	குவிக் கர்க்க	சிறு வட்டு
212.	mobile computing	சுங்கம் பரிசுஞ்சய	செல்லிடக் கணிமை
213.	mobile marketing	சுங்கம் அலேகிகர்ணய	செல்லிடச் சந்தைப்படுத்தல்
214.	modularization	மோடி஗்ருலகர்ணய	கூறு நிலையாக்கம்
215.	modulation	இருப்பகய	பண்பேற்றம்
216.	most significant	வெங்கி வேகேகி	அதியுயர் மதிப்பு
217.	mother board	மூல பூர்வு	தாய்ப்பலகை
218.	multi agent systems	இனு கார்க பட்டியல்	பல்முகவர் முறைமை
219.	multi user-multi task	இனு பரிசீலக - இனு கார்கய	பற்பயனர்-பற்பணி
220.	multi-core processors	இனு கர் கூக்கன	பல்கரு செயலி
221.	multimedia objects	இனு மாடிஸ விசீஸ்	பல்லுரூடக பொருள்
222.	multiplexer	இனு பர்கார்கய	பல்சேர்ப்பி
223.	multiplexing	இனு பர்கர்ணய	பல்சேர்ப்பு
224.	multiprocessing	இனு கூக்கும்	பன்முறைவழியாக்கி
225.	multitasking	இனுகார்க கிரும	பற்பணி
226.	multi-threading	இனு-அனுகிருக்கினய	பல் செயல்கூறு
227.	nature inspired	பூக்கி ழேரித பரிசுஞ்சய/	இயற்கை உள்ளிர்ப்புக்

	computing	പ്രകാശി അനുപ്രേരിത പരിഗണനയ	കമ്പിംഗ്
228.	nested loop	നിശ്ചിത ഇലക്ക	നീഥിത്ത വസാധയമ്
229.	network addresses translating (NAT)	പൊതു യോമു പരിവർത്തനയ	വസലധമൈമപ്പു മുകവരി പെയർപ്പു
230.	network architecture	പൊതു നിർമ്മിതയ	വസലധമൈമപ്പുക് കട്ടമൈമപ്പു
231.	network layer	പൊതു സ്റ്റേറ്റ	വസലധമൈമപ്പു അടുക്കു
232.	network model	പൊതു ആക്ഷരിക	വസലധമൈമപ്പു മാതീരി
233.	neural network	ജൈബ്രാക പൊതയ	നുരമ്പിയല് വസലധമൈമപ്പു
234.	non-functional requirement	കാർഡബൾ്ദ നോവൻ അവശ്യതാവ	ചെയല്ചാരാത് തേവൈകൾ
235.	normalization	പ്രമിതകരണയ	ഇയല്പാക്കല്
236.	null	അക്ഷിയുള്ള	വെற്റു
237.	object code	വർഷ കേംത/	പൊനുൾ കുറി
238.	object oriented	വർഷ നാമ്പുര / പാടക	പൊനുൾ നോക്കുത്തൈ
239.	object- relational model	വർഷ-സമിഭന്ദക ആക്ഷരിക	പൊനുൾ ഉറവുനിലൈ മാതീരി
240.	octal	അഞ്ചേല്ല	എൻമാമ്പ
241.	office automation system (OAS)	കാർഡാല ജൈവംകരണ പഢ്ഡിതിക	അലുവലകത് തന്ഩിയക്ക മുന്നൈ
242.	offline	മാർക അപഗ്രന/ മാർക്കന നോവൻ	തൊടരഹ നിലൈ
243.	one's compliment	ഒന്നേക്കി അനുഭ്രക്കയ	ഒൻ‌റിൻ നിരപ്പി
244.	online	മാർക്കന	തൊടരഹാ നിലൈ
245.	open source	ഓഫൈസ മൂലക	തിരുന്ത മുലമ്പ
246.	operational feasibility	മേഖലേ അക്ഷയാവ	ചെയർപാട്ടുച് ചാൽത്തിയപ്പാടു
247.	operator category	കാർക പ്രവർഗ്ഗ	ചെയലി വകൈ
248.	operator precedence	കാർക പ്രമുഖതാ	ചെയലി മുൻ‌നുറിയൈ
249.	optical character reader (OCR)	പ്രകാശ അഴു ലക്ഷ്യ കീയവനയ	ഒൻപിയല് എழുത്തുനു വാസിപ്പാണ്

250.	optical mark reader (OMR)	பிகாக உகுவு கீர்வனம்	காந்த மை எழுத்துரு வாசிப்பான்
251.	output	பிரிடுங்கை	வெளியீடு
252.	packet switching	போடி ஒுவமாரை	பொதி மடைமாற்றல்
253.	paging	பிலைகர்ந்கை	பக்கமிடல்
254.	paradigm	ஸ்கிமாட்டைக்கை / பிரிமாங்கை/பிரிரசைய	கோட்பாட்டுச் சட்டகம்
255.	parallel implementation	கமாங்கீர சீரைப்பங்கை	சமாந்தர அமுலாக்கம்
256.	parameter passing	பருமதி கூலீம்	பரமானக் கடத்தல்
257.	parity	கமதூவு	சமநிலை
258.	password	முர படிக	கடவுச்சொல்
259.	payment gateway	கேவும் வாசல் டீல்வாரங்	பணக் கொடுப்பனவு நுழைவாயில்
260.	periodic refreshing	அவற்ற பூர்வீடிகர்ந்கை	காலமுறை புதுப்பித்தல்
261.	peripheral device	பரையந்த உபாங்கை / உபநும்கை	புறச் சாதனம்
262.	phablet	யார்டிலை	பெப்லட்
263.	phased implementation	அவி஦ிசீரைப்பங்கை / பிரைவர் தியாத்மககிரி	கட்ட அமுலாக்கல்
264.	phase modulation	கலா முரைங்கை	நிலை பண்பேற்றல்
265.	phishing	தந்தெளி	வழிப்பறித்தல்
266.	physical layer	ஹெலிக் சீர்வரங்	பெளதீக அடுக்கு
267.	physical memory	ஹெலிக் மதகை	பெளதீக நினைவுகம்
268.	pilot implementation	தியாமக சீரைப்பங்கை / தியாமக தியாத்மக கிரி	முன்னோடி அமுலாக்கல்
269.	piracy	வெங்கள்வகை / முன்விந்கை	களவு
270.	pirated software	வெங்க/முன்விந் மஷ்டுகாங்கை	திருட்டு மென்பொருள்
271.	plagiarism	ஞீலி/ரவுகை வெங்கரை	கருத்துத் திருட்டு
272.	point to point connection	சுற்று கெங்கங் கமிக்கை	இணைப்பு

273.	pointing device	දැක්වුම් උපාංගය	සුංචි සාතනම්
274.	port	කෙටෙනිය	වායිල්, තුරේ
275.	portable external hard disk	ජංගම/සූචනකීය බාහිර දුක්‍රී තැටිය	කාවත්තකු පුළු වෘත්තයේ
276.	portal	ද්වාරය/ ආමුඩ්වාරය	වැළවාසල්
277.	Point of sale (POS) machine	විකුණුම් පොල යන්තු	විශ්‍ර්‍යපනී මිට නියන්තිරාම
278.	postulate	ලැපක්ල්පනය	නුකොස්
279.	power supply	විදුලි සැපයුම/ප්‍රවාහන සැපයුම	මින් ව්‍යුහයේ
280.	presence check	තරිතතා පරික්ෂාව	இருத்தல் சரிபார்த்தல்
281.	presentation layer	සම්බන්ධීරුවන් කිරීම් සේවය	முன්வෙப්පு அடுக்கு
282.	primary key	ප්‍රාථමික/මුළු යතුර	முதன්මைச் சාධී
283.	primitive data type	ප්‍රාථමික දත්ත වර්ගය	පුර්වීகත் தரவு வகை
284.	privacy	පෝද්‍යුගලීකත්වය	அந்தரங்கம்
285.	private key	පෝද්‍යුගලීக යතුර	பிரத்தியேகச் சාධී
286.	process	த්‍රිකාවලිය/ත්‍රිකායනය/ සැකසුම	செயல்/ முறைவழியாக்கல
287.	process control block(PCB)	ත්‍රිකායන பாலன விண்விய	செயல் கட்டுப்பாட்டுத் தொகுதி
288.	process management	ත්‍රිකායන கலம்நாகர்ணய	செயல் முகாமைத்துவம்
289.	process states	ත්‍රිකායන தன்மை	செயல் நிலை
290.	process transition	ත්‍රිකායන சங்குமள்ளு	செயல் நிலைமாறல்
291.	product commercialization	தිෂ්පාදන வாணிபங்கரණம்	தயாரிப்பு வர்த்தகமயமாக்கல்
292.	product of sum (POS)	லේக්නයන්ගේ ගුණිතය	கூட்டுத் தொகையின் பெருக்கம்
293.	program translator	இலமලේඛ பரிவර්தன	செய்நிரல் மொழிபெயர்ப்பான்
294.	proprietary	தිමිකම් சதින	தனியுரிமை
295.	protocol	தියමාවලිය	நடப்பொழுங்கு

296.	prototyping	இலாகஷ்டிகர்ணய	மூலவகை மாதிரி
297.	proxy server	நியேஞ்ன சேவாளாய்கடை	பதிலாள் சேவையகம்
298.	pseudo code	வசார் கேதர	போலிக்குறி
299.	public switch telephone network (PSTN)	பொடு ஸ்டீல் டிரகுபின் பூலய	பொது ஆளியிடப்பட்ட தொலைபேசி வலையமைப்பு
300.	public key	பொடு யநுர்	பொதுச் சாவி
301.	pulse code modulation	ஸ்பாஸ் கேத மூர்க்கனய	தூடிப்புக்குறி பண்பேற்றம்
302.	pulse width modulation	ஸ்பாஸ் வீதர் மூர்க்கனய	தூடிப்பு அகலப் பண்பேற்றம்
303.	radio button	வீகல்லீப் கேரீம்	ரேடியோ பொத்தான்
304.	random access memory (RAM)	சக்மினாலி பிளேக் மதகய	தற்போக்கு அணுகல் நினைவகம்
305.	range check	பருச் பரிக்கூல	வீச்சு சரிபார்த்தல்
306.	rapid application development (RAD)	கீழ் யெட்டுமிழ் சங்கிரைக்கினய	துரித பிரயோக விருத்தி
307.	read only memory (ROM)	பயின் மாநு மதகய	வாசிப்பு மட்டும் நினைவகம்
308.	real time	தறிச் காலிக	நிகழ்நேரம்
309.	record	ரெப்ளேகினான்	பதிவு
310.	redo	நாவத கிரீம்	மீளச் செய்
311.	redundancy	சுமதிரிக்கத்தால்	மிகைமை
312.	reference model	கோமு ஆகாதிய	வலையமைப்பின் கட்டமைப்பு
313.	refreshing	புதுப்பிக்க கிரீம்	புத்துயிர்ப்பித்தல்
314.	register memory	ரெஜிஸ்டர் மதகய	பதிவகம்
315.	relational	சுமிக்கெட்க	தொடர்பு, உறவுநிலை
316.	relational model	சுமிக்கெட்க ஆகாதிய	உறவுநிலை மாதிரி
317.	relational database	சுமிக்கெட்க ஒத்த சுமிலாய்	உறவுநிலை தரவுத்தளம்
318.	relational instance	சுமிக்கெட்க திடுரைக்குனய	தொடர்பு முறை எடுத்துக்காட்டு

319.	relational schema	සම්බන්ධිත පරිපාලීක සටහන	தொடர்பு முறைத் திட்டம்
320.	relationship	සම්බන්ධිතாவய	தொடர்புமுறை
321.	remote	දුරස්ථි	தொலை, தூர்
322.	render	විදෙහු	வழங்கு
323.	repeater	ප්‍රතිචාරකය	மீனி, மீட்டி
324.	repetition	ப්‍රතිඵලිகය	மீன் செயல்
325.	reset button	ප්‍රත්‍යාரම්භ බොත්තම	மீளமைப்புப் பொத்தான்
326.	retrieve	சමුද්ධිරණ	மீளப்பெறு
327.	return value	ප්‍රත්‍යාගමන අයය	திரும்பல் பெறுமானம்
328.	reverse auction	ප්‍රතිවෙන්දේසිය	எதிர்மாற்று ஏலம்
329.	ring topology	මூட சீலகය	வளைய இடத்தியல்
330.	router	மங் ஹසුරுவி	வழிப்படுத்தி, வழிச்செலுத்தி
331.	routing	மங் ஹசீருவி	வழிச்செலுத்தல்
332.	scanner	සුපிரிக்ஸகය	நனுகு நோக்கி
333.	scheduler	தியமகரண	ஓழுங்குபடுத்தி
334.	scope of variable	வිවෘත பருக்கை	மாறி செயற்பரப்பு
335.	query	வිමුණ்ட	வினவல்
336.	selection	தேர்ம	தெரிவு
337.	selector	வரகය	தேர்வி, தேர்ந்தெடுப்பி
338.	sensor	ஸங்கீர்ணகை	உணரி
339.	sequence	அனுகுமை	தொடர்
340.	sequential circuit	அனுகுமிக பරිපරை	தொடர்ச் சுற்று
341.	sequential search	அனுகுமிக கேவும	வரிசைமுறைத் தேடல்
342.	server	கேவாடாயகை / அனுஞானகை	சேவையகம்
343.	session layer	සககී ස්யரை	அமர்வு அடுக்கு
344.	sharable pool	ஒலுமார் ப්‍රமාண	பகிரதகு பொது இடம்
345.	sign-magnitude	கைஞ்சுவத் ப්‍රமාண / ஸங்லக்ஷித	குறியுடைய வீச்சளவு

		பரிமானங்கள் / அங்கீத பரிமானங்கள்	
346.	single user-multi task	லேக் பரிசீலக-இனு காரையை	தனிப்பயனர்-பற்பணி
347.	single user-single task	லேக் பரிசீலக-லேக் காரையை	தனிப்பயனர்-தனிப்பணி
348.	smart card	சின்று காவிப்பது	சூட்டிகை அட்டை
349.	smart phone	சின்று டிருங்கள்நாய்	சூட்டிகைத் தொலைபேசி
350.	smart system	சின்று பல்வேறுமிகு பார்க்கல்	சூட்டிகை முறைமை
351.	social networking	சமூக பாலகர்ணாய்	சமூக வலையமைப்பாக்கல்
352.	software	மெட்டுக்காங்கு	மென்பொருள்
353.	software agent	மெட்டுக்காங்கு கார்கள்	மென்பொருள் முகவர்
354.	sort	தேர்மீல்	வரிசைப்படுத்து
355.	source	புதுவு	மூலம்
356.	spiral model	சுற்றில ஆகங்கிய	சுருளி மாதிரி
357.	spooling	விதிமீல்	சுற்றுதல்
358.	Star topology	தூர்கா ஸ்டீலகை	விண்மீன் இடத்தியல்
359.	stepwise refinement	பிளவிருக்கார பிரிப்பட்டு	படிமுறை நீக்கல்
360.	storage	ஆலியங்கள்	சேமிப்பு
361.	storage allocation	ஆலியங்கள் வினாக்களாய்	சேமிப்பு ஒதுக்கல்
362.	stored program concept	ஆலித குமலேஷ சங்கல்தீப்பாய்	சேமிக்கப்பட்ட செய்நிரல் எண்ணக்கரு
363.	structure	விதிமீலங்கள்	கட்டமைப்பு
364.	structure chart	விதிமீலங்கள்	கட்டமைப்பு வரைபு
365.	structured	விதிமீலங்கள்	கட்டமைப்புடைய
366.	structured query language(SQL)	விதிமீலங்கள் விமீலித்து செய்து விடுதல்	கட்டமைப்பு வினவல் மொழி
367.	submit button	யோசு கொஞ்சம்	சமர்ப்பித்தல் பொத்தான்
368.	subnet mask	ஸ்டெப் பால ஆலியங்கள்	உபவலை மறைமுகம்
369.	sub-netting	ஸ்டெப்-பாலங்கள்	உபவலையமைப்பு

370.	sub-program	ஸு-நூல்களை	துணைச் செய்நிரல்
371.	sum of products (SOP)	ஒன்றியங்களை வீகங்கள்	பெருக்கங்களின் கூட்டுத்தொகை
372.	supply chain management	ஈடுபாடு மூலம் கலாமனுகர்ணங்கள்	விநியோக சங்கிலித்தொடர் முகாமைத்துவம்
373.	swapping	பிரதிநிர்ணய	இடமாற்றல்
374.	switch	ஈவீலை	ஆஸி
375.	syntax	காரக ரீதி	தொடரியல்
376.	system development life cycle(SDLC)	பட்டினி சங்கிலித்தொடரியல்	முறைமை விருத்தி வாழ்க்கை வட்டம்
377.	table	வகுவி	அட்டவணை
378.	table check constraint	வகு பரீக்ஷை சிங்ரேஷன்கள்	அட்டவணை சரிபார்த்தல் கட்டுப்பாடு
379.	tag	எஸ்டிளங்கள்	ஒட்டு
380.	Technical feasibility	தொகீலங்கள் உக்காவு	தொழினுட்பச் சாத்தியக் கற்கை
381.	telecommuting	டிரக்ஸீர் சங்வாடம் / டிர சுந்திலீடுகள்	தொலைசெயல்
382.	testing strategy	பரீக்ஷை உபகாரம்	பரீக்ஷித்தல் உபாயம்
383.	text and font	பாட சுறு அக்ஷர	வாசகமும் எழுத்துருவும்
384.	text formatting	பாட ஒழுகொலி கேள்விகள்	வாசக வடிவமைப்பு
385.	text input	பாட ஆடாக	வாசக உள்ளீடு
386.	normal form	பூமத அவசியாவு	இயல்பாக்கல் வடிவம்
387.	thumbnail	ஈடுகோலை ரை	குறும்படம்
388.	time division modulation (TDM)	கால பெட்டு மிருங்கனங்கள்	நேரப் பிரிவுப் பண்பாக்கம்
389.	time sharing	கால வீகங்கள்	நேரப்பகிர்வு
390.	timing	கால ஏற்றுக்காட்டுகள்	நேரக்கணிப்பு
391.	top down design	முடிநீ விலை ஈடுபட்டுகள்	மேலிருந்து கீழான வடிவமைப்பு

392.	touch pad	ස්පෑරුක උපභිනය / පාදකය	තොटු අට්ටේ
393.	touch screen	ස්පෑරුක තීරය	තොටුතිරෙ
394.	transaction processing system(TPS)	ගනුදෙනු සකසුම් පද්ධතිය	පරිමාත්‍රේ සේයලාක්ක මුහුරුමය
395.	transitive dependency	සංකූත්තී පරායන්තාව	මාරුම් සාර්පු නිලෙ
396.	transport layer	ප්‍රවාහන ස්ථිරය	පොක්කුවරත්තු අඹුකු
397.	transport protocol	ප්‍රවාහන නියමාවලිය	පොක්කුවරත්තු න්‍යාප්‍රාගුණු
398.	tuple	ලපලකිකාන/ලේමිය	පතිබු/නිරෝ
399.	twisted pair	අභිරි යුගල	මුළුකකිය සොඳු
400.	two's compliment	දෙකෙහි අනුපූරකය	இரண்டின் நிரப்பி
401.	type check	පුරුෂ පරික්ෂාව	වකා සරිපාරත්තල්
402.	constraint	සංරෝධනය	කට්ටුපාටු වකා
403.	ubiquitous computing	සැරවට්ති ආගත්තනය	எங்கும் வியாபித்த கணிமை
404.	undo	අනෝසි කිරීම	செயல்தவிர்
405.	unguided media	නியමු නොවන மாடின	வழிபடுத்தப்படாத ஊடகம்
406.	uni-casting	සංස්கර්ଣ සිල්‌ப්‍රේஃ்ட්‌னාය	தனிப்பரப்பல்
407.	unicode	ஷ்டிகேவி/ லீககேவீ	ஒற்றைக்குறி மුහු
408.	unique constraint	அனின ஸංரෝධகය	தனித்துவக் கට්ටුපාටු
409.	unit testing	லீகக පරික්ෂාனය	அலகுச் சோதனை
410.	universal	සාර්චි	பොතු
411.	updating	யාවත්කාලීන කිරීම	தற்காலப்படுத்தல்
412.	user	පරිශීලක	பயனர்
413.	user defined	පරිශීලක තීර්වාචිත	பயனர் வரையறை
414.	validation	වලංග කිරීම	சෙළුවුப්‍රයාகක්කல்
415.	variable	විවෘතය	මාற්
416.	very large scale integration (VLSI)	ඉතා විශාල පරිමානයේ අනුකූලත	மிகப் පෙරියොவිලාன ඉග්‍රங்கிணைப்பு

417.	video graphic adapter (VGA)	टුජේ විනුක අනුග්‍රහකරව	කාබෙනාඩී බරයි පොරුත්ති
418.	virtual community	අතරීන ප්‍රජාව	මෙය්තිකර් සමුකම්
419.	virtual memory	අතරීන මතකය	මෙය්තිකර් නිශ්චාවකම්
420.	virtual storefront	අතරීන වෛලද පුද්ගලිකාගාරය	මෙය්තිකර් කැසුමුකප්පු
421.	waterfall model	දියඇල් ආකෘතිය	න්ර් ව්‍යුෂ්සි මාතිරි
422.	wave length	තරංග ආයාමය	අලෙල න්සාම්
423.	web portal	වෙබ් දේවාරය	වෙළෙ බාසල්
424.	web server	වෙබ් සේවාදායකය	இணைய சேவையகம்
425.	web service provider	වෙබ් සේවා செப்புகிரர்	இணைய சேவை வழங்குனர்
426.	white box testing	ස්වේච්ඡ මංජ්‍ය පරීක්ෂාව	வெண்பெട்டிச் சோதிப்பு
427.	world wide web (WWW)	லෝ'ක විසිර විගමන	உலகளாவிய வෙළை
428.	uniform resource locator (URL)	එකාකාර සම්පත් තිශ්වායකය	சිර්மை வள இருப்பிடங்காட்டி
429.	uniform resource identifier(URI)	එකාකාර සම්පත් හැඳුන්වනය	சිර්மை வள ¹ அடையாளங்காட்டி

This glossary is still being prepared.

