Information and Communication Technology

Grade 8
Reading Book

Educational Publications Department

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
Nava jeevana 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 මවකගෙ දරුවෝ
එක නිවසෙහි වෙසෙනා
එක පාටැති එක රුධිරය වේ
අප කය තුළ දුවනා

එබැවිනි අපි වෙමු සොයුරු සොයුරියෝ
එක ලෙස එහි වැඩෙනා
ජීවත් වන අප මෙම නිවසේ
සොඳින සිටිය යුතු වේ

සැමට ම මෙත් කරුණා ගුණෙනී
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කිසි කල නොම දිරනා

ආනන්ද සමරකෝන්

ஒரு தாய் மக்கள் நாமாவோம்
ஒன்றே நாம் வாழும் இல்லம்
நன்றே உடலில் ஓடும்
ஒன்றே நம் குருதி நிறம்

அதனால் சகோதரர் நாமாவோம்
ஒன்றாய் வாழும் வளரும் நாம்
நன்றாய் இவ் இல்லினிலே
நலமே வாழ்தல் வேண்டுமென்றோ

யாவரும் அன்பு கருணையுடன்
ஒற்றுமை சிறக்க வாழ்ந்திடுதல்
பொன்னும் மணியும் முத்துமல்ல - அதுவே
யான்று மழியாச் செல்வமன்றோ.

                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.

W. M. Jayantha Wickramanayaka,
Commissioner General of Educational Publications,
Educational Publications Department,
Isurupaya,
Battaramulla.
2019.04.10

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Board of Editors

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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).
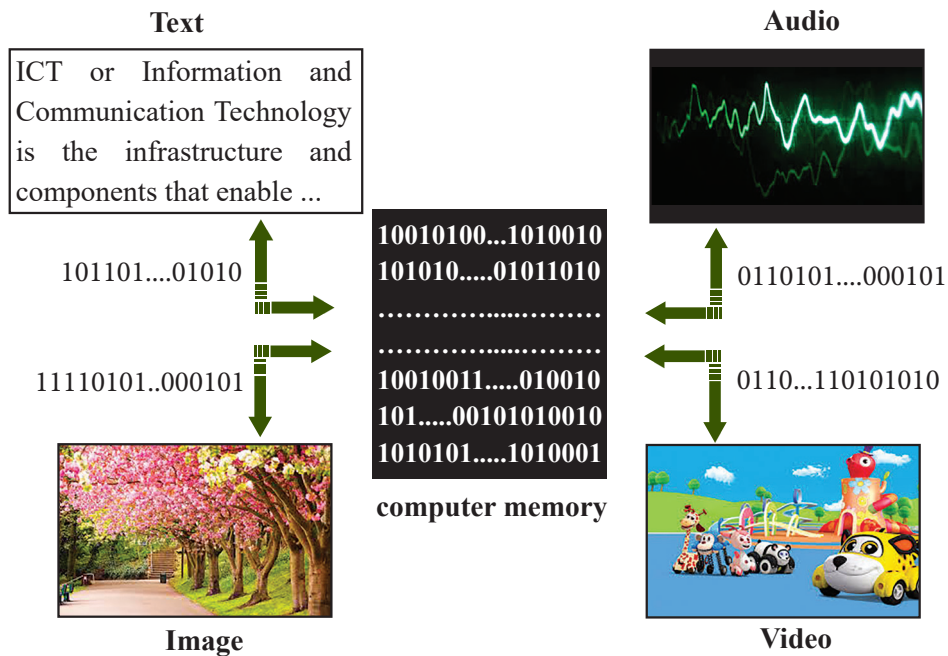
Figure 1.1 : Computer and user

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

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}, $7B_{16}$
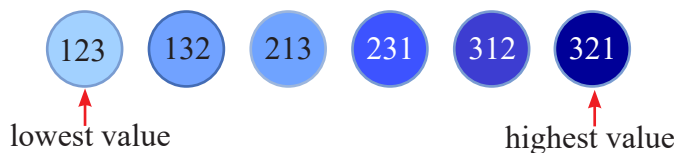
Refer to workbook for Activity 1.1.

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.

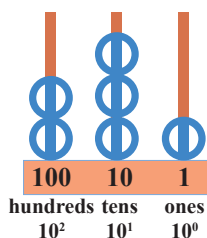Symbols in decimal number system - 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Each position in a given number has a place value.

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

123   132   213   231   312   321

lowest value   highest value

Let us learn about the formation of a decimal number.

Displaying 231 on a counting frame   **231 in expanded form**

Place value

e.g. - 231_{10} $= 2 \times 10^2 + 3 \times 10^1 + 1 \times 10^0$

$= 2 \times 100 + 3 \times 10 + 1 \times 1$

$= 200 + 30 + 1$

$= 231$

100	10	1
hundreds	tens	ones
10^2	10^1	10^0

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

1.5 Binary number system

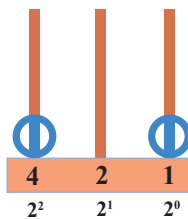The Binary number system uses two different symbols 0 and 1.

Symbols of binary number system - 0, 1

Binary symbols 0 or 1 are called bits.

Bit = **B**inary dig**it** ⟶ **0 or 1**

Let us learn about the formation of a binary number.

Display 101_2 counting frame

101_2 in expanded form

$$e.g. - 101_2 \quad = \underline{1 \times 2^2} + \underline{0 \times 2^1} + \underline{1 \times 2^0}$$

$$= \underline{1 \times 4} + \underline{0 \times 2} + \underline{1 \times 1}$$

$$= \quad 4 \quad + \quad 0 \quad + \quad 1$$

$$= \quad 5_{10}$$

4	2	1
2^2	2^1	2^0

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.
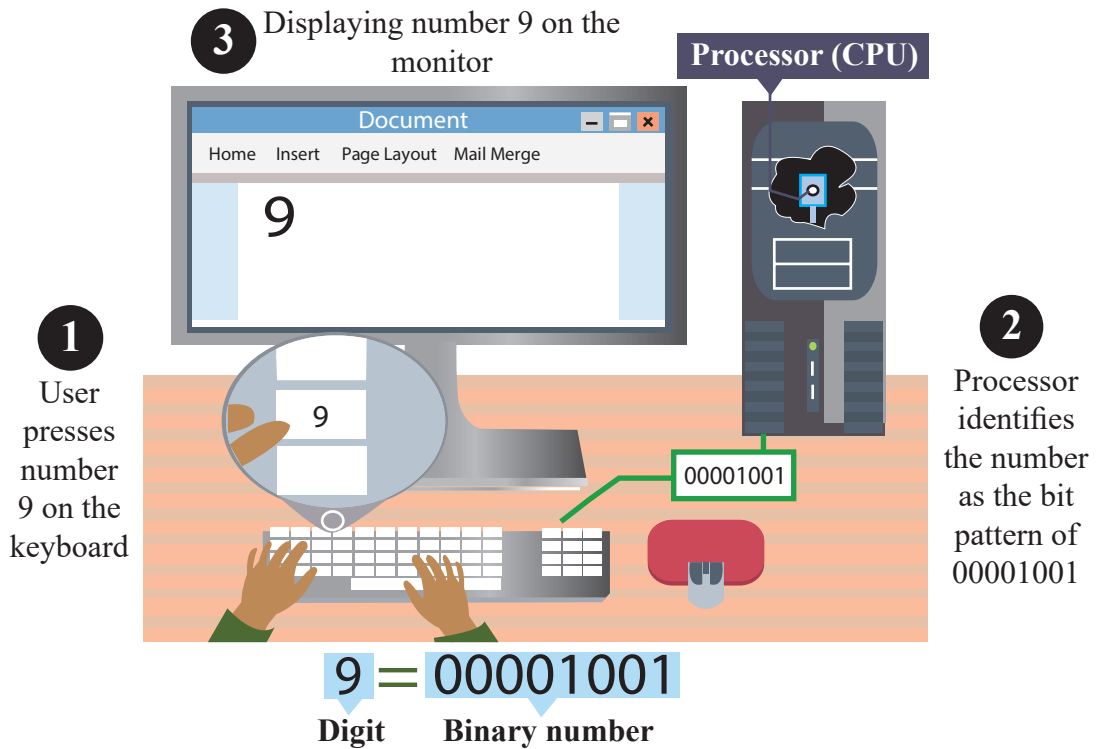
③ Displaying number 9 on the monitor

Processor (CPU)

① User presses number 9 on the keyboard

② Processor identifies the number as the bit pattern of 00001001

$9 = 00001001$

Digit — Binary number

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.
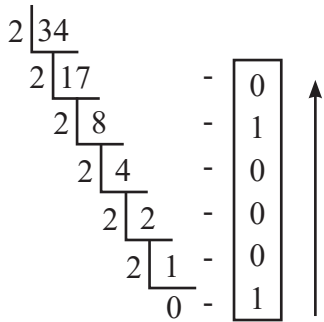
e.g. - Converting 13_{10} to a binary number
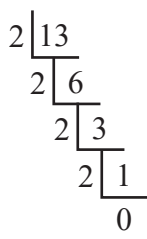
$13_{10} = 1101_2$

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

```
2 | 34
 2 | 17        -  0
  2 | 8        -  1
   2 | 4       -  0
    2 | 2      -  0
     2 | 1     -  0
       0       -  1
```

$34_{10} = 100010_2$

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

```
2 | 49
 2 | 24       -  1
  2 | 12      -  0
   2 | 6      -  0
    2 | 3     -  0
     2 | 1    -  1
       0      -  1
```
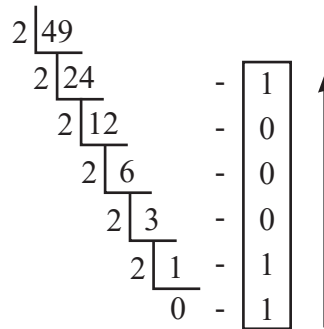
$49_{10} = 110001_2$

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	0
	×	×	×	×	×	×	×	×
Place value	128	64	32	16	8	4	2	1
	128	0	32	0	8	0	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

e.g. 1 -

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

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}

$10111_2 = 23_{10}$

e.g. 2 -

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

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}

$10010_2 = 18_{10}$

e.g. 3 -

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

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}

$11111_2 = 31_{10}$

Power of 2

$2^0 = 1$
$2^1 = 2$
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
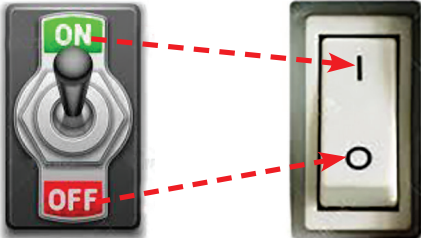$2^6 = 64$
$2^7 = 128$
$2^8 = 256$
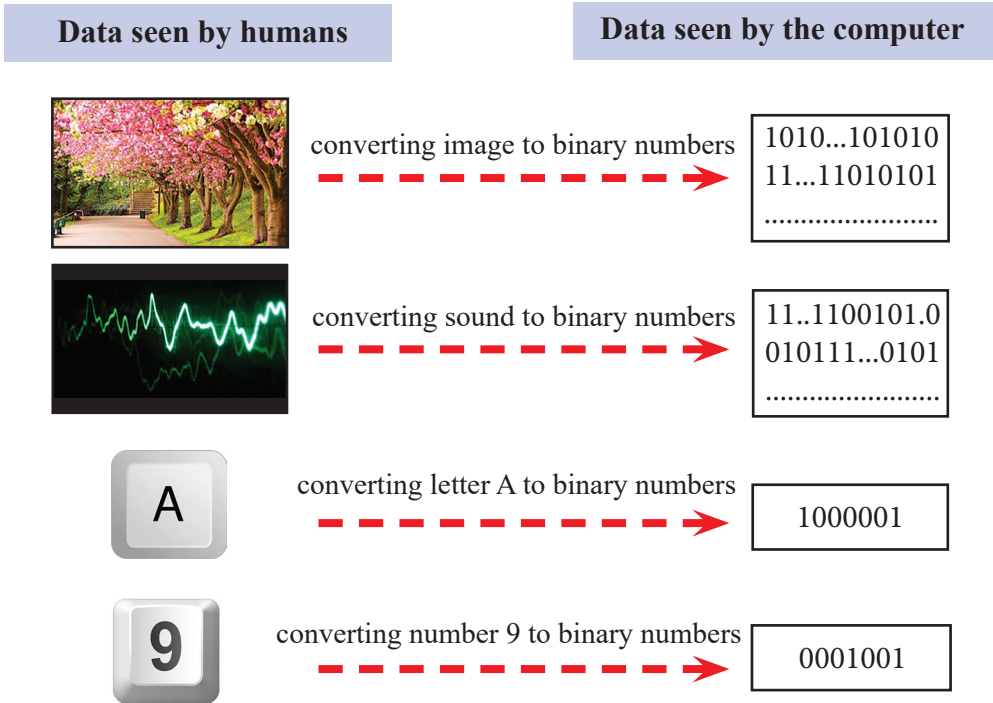$2^9 = 512$
$2^{10} = 1024$

Refer to workbook for Activity 1.4.

The computer uses 'ON' and 'OFF' states to represent data and instructions as a bit pattern of 1s and 0s.
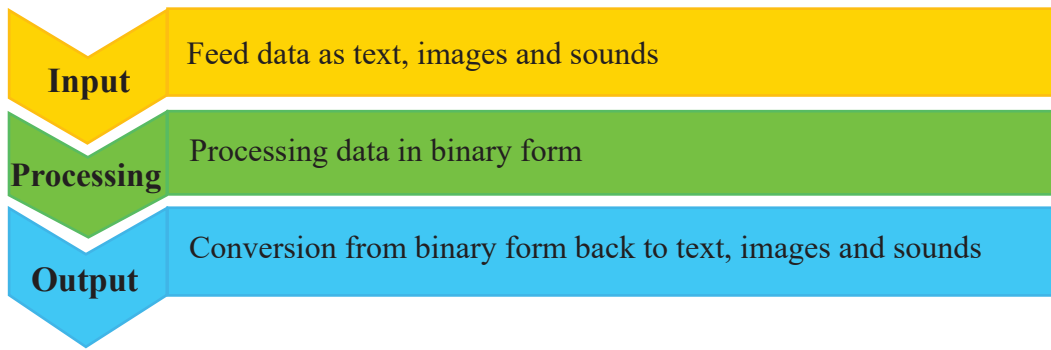
Texts, sounds and images are stored in the computer memory as binary bit patterns. Hence, all data need to be converted into binary form before processing.

e.g. -

Data seen by humans		Data seen by the computer

converting image to binary numbers

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

converting sound to binary numbers

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

A

converting letter A to binary numbers

1000001

9

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.

Input	Feed data as text, images and sounds
Processing	Processing data in binary form
Output	Conversion from binary form back to text, images and sounds

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.

main memory   110...101   microprocessor

image   1110...11

digital camera

keyboard   1010...10   text   system unit   010...10   monitor
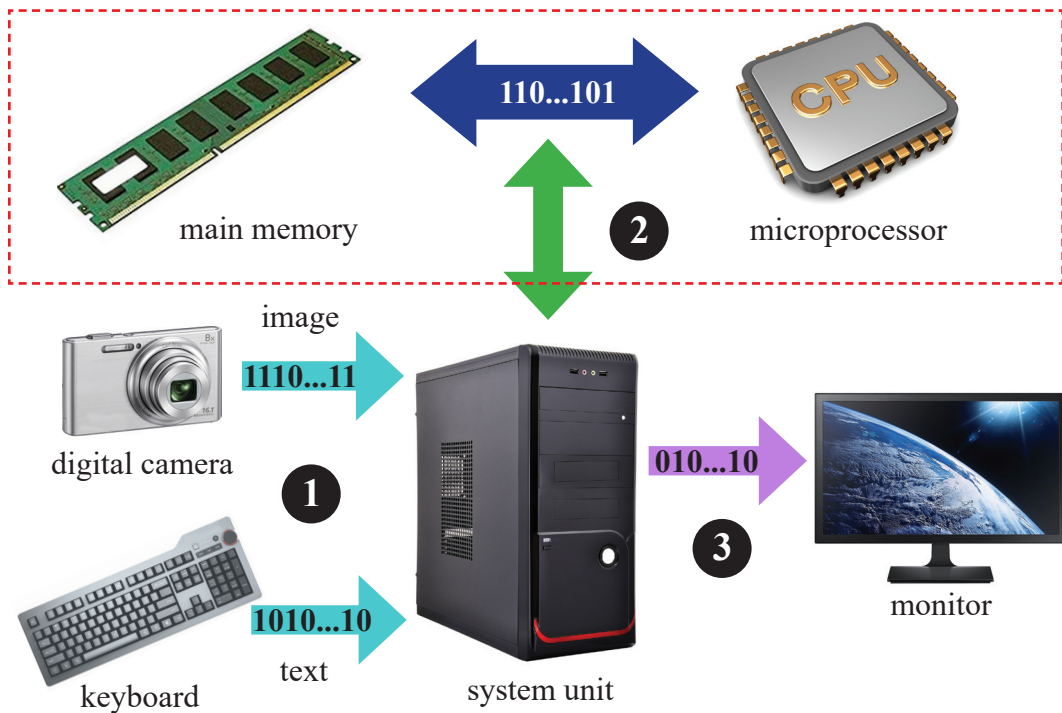
Figure 1.5 : Flow of binary data in a computer

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.

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	decimal to binary

binary to decimal

$1\,1\,0\,1\,1\,0\,0\,1$

$1 \times 2^0 = 1 \times 1 = 1$
$0 \times 2^1 = 0 \times 2 = 0$
$0 \times 2^2 = 0 \times 4 = 0$
$1 \times 2^3 = 1 \times 8 = 8$
$1 \times 2^4 = 1 \times 16 = 16$
$0 \times 2^5 = 0 \times 32 = 0$
$1 \times 2^6 = 1 \times 64 = 64$
$1 \times 2^7 = 1 \times 128 = 128$

$1 + 8 + 16 + 64 + 128 = 217$

decimal to binary

Remainder

2	156	
2	78	- 0
2	39	- 0
2	19	- 1
2	9	- 1
2	4	- 1
2	2	- 0
2	1	- 0
	0	- 1

$156_{10} = 10011100_2$

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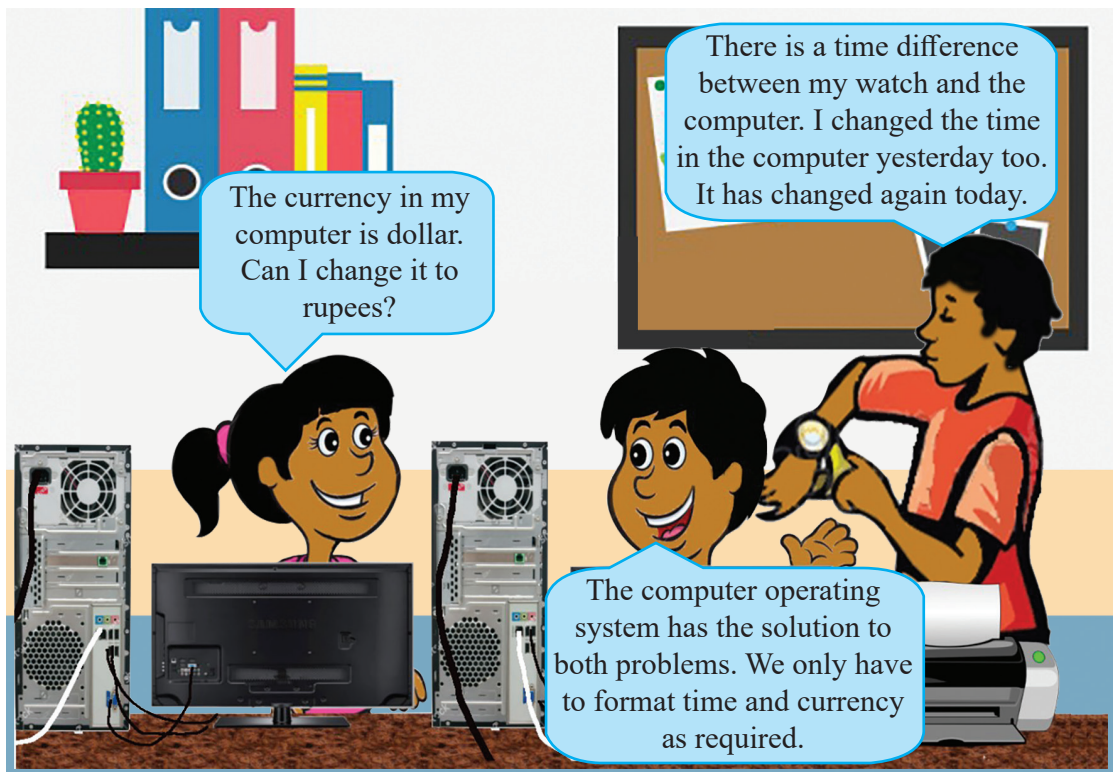
It is important to format the date, time zone, time, currency and number to suit the country where the computer is used.

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
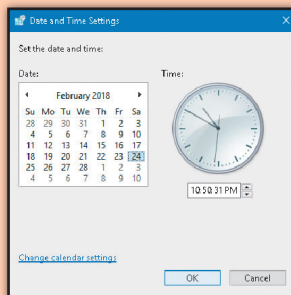
Date and time of a computer

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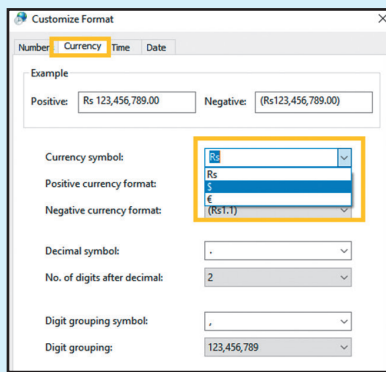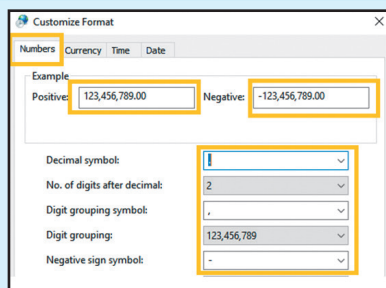
Number formats	
	Absence of a currency and number formats to suit international acceptance, could be a drawback when working with the Internet.

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.
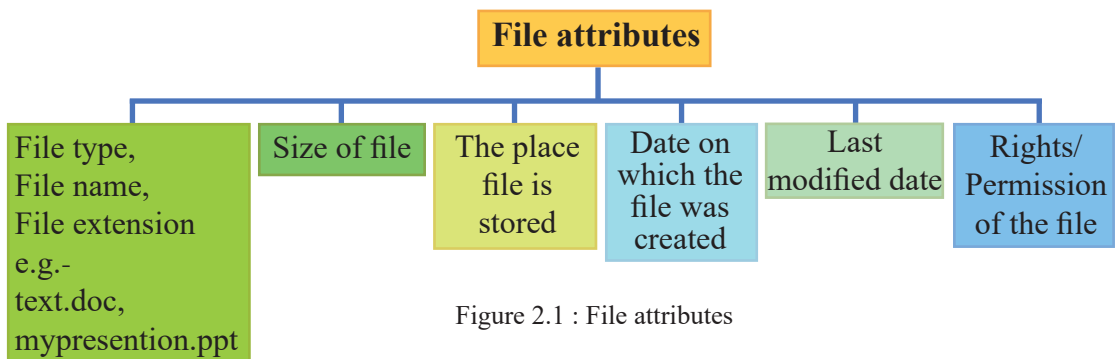
Figure 2.1 : File attributes

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.
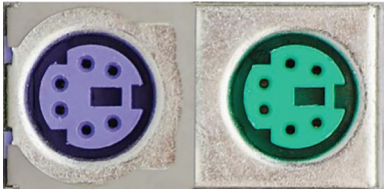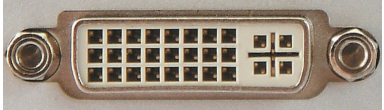
Refer to workbook for Activity 2.3.

2.2   Troubleshooting and maintenance of computer

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

```
          Problems related to computers
              /                    \
Hardware related problems    Software related problems
                               /                    \
Application software related  problems    Operating system related problems
```
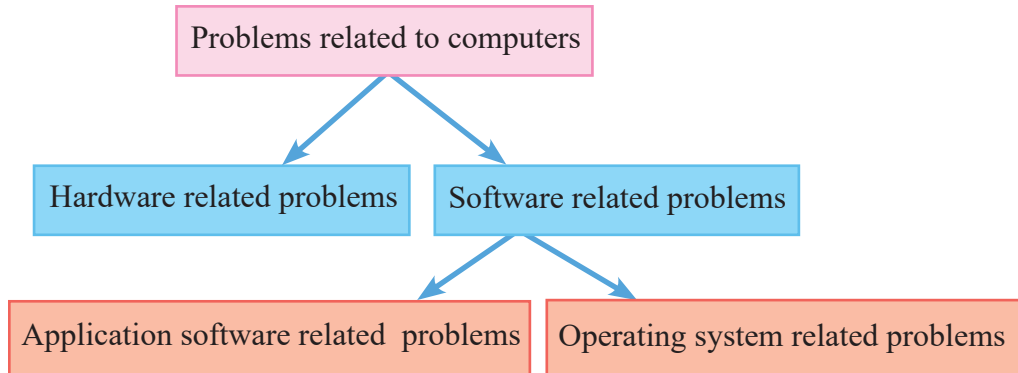
First, let us study what hardware problems are.

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

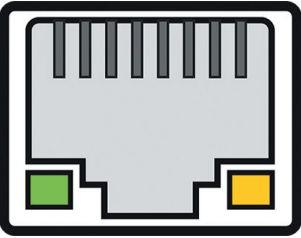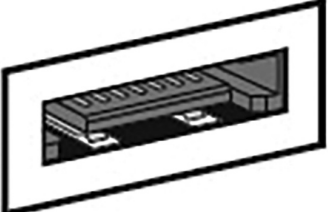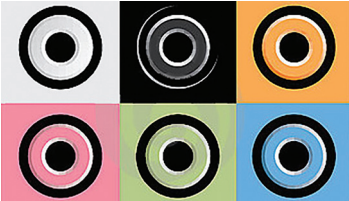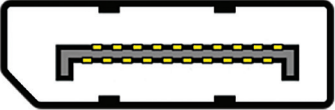| 1	PS/2 port	For keyboard/ mouse
2	VGA port	For monitor with VGA connection
3	DVI port	For monitor with DVI connection
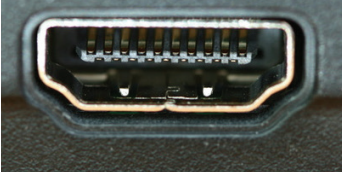
4	HDMI port	HDMI is used to connect a television set instead of the monitor. Cables that are connected to this port can input and output both audio and video.
5	USB port	For all devices with USB type connections
6	RJ45 Ethernet port	For networking
7	eSata port	For external storage devices
8	HD Audio 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.
>
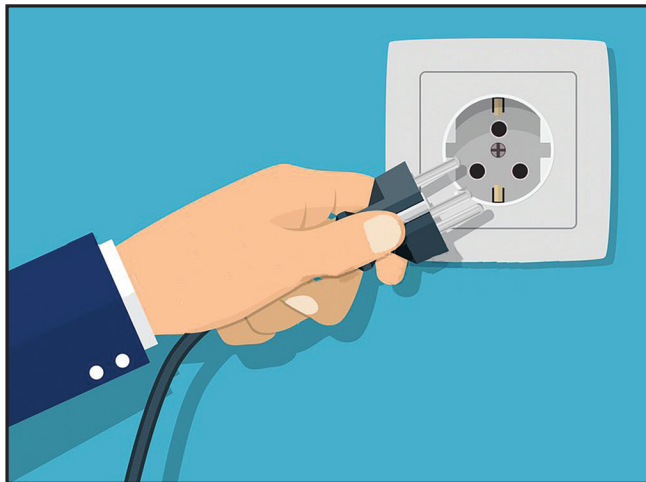> In checking the power supply, first disconnect the main power supply.

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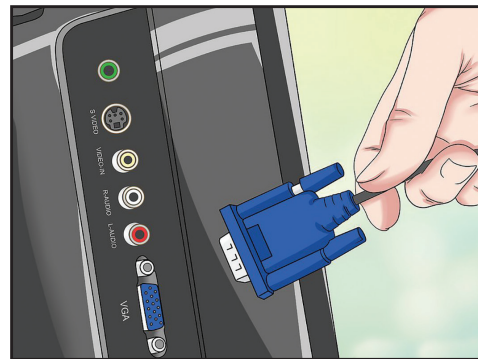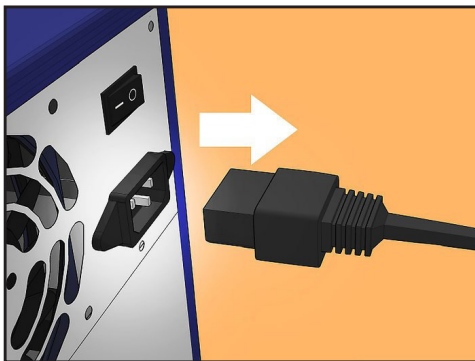
| Step 4 | If all the above items are connected properly, power on the UPS from the main supply. |

| Step 5 | Next, switch on the computer. It is most likely to get started. If it does not, seek technical assistance. |
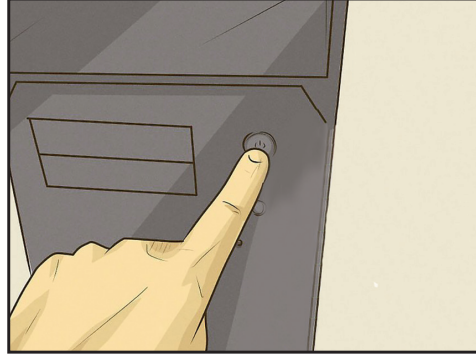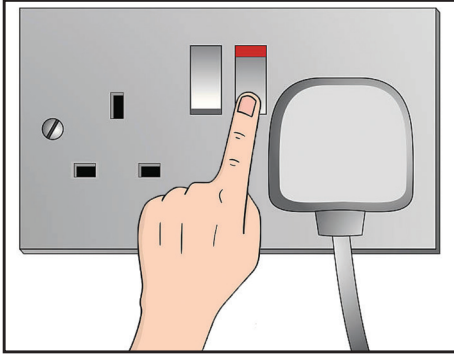
Solution 02 :

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. |
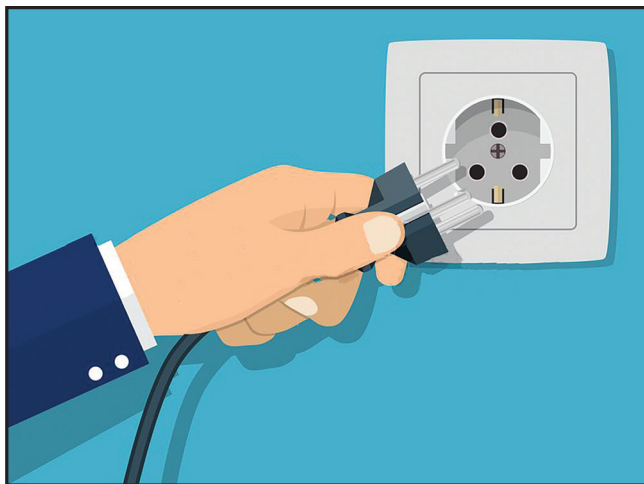
Step 2   Examine the power cables and the cables connecting the computer and the screen. If they are not properly connected, connect them correctly.
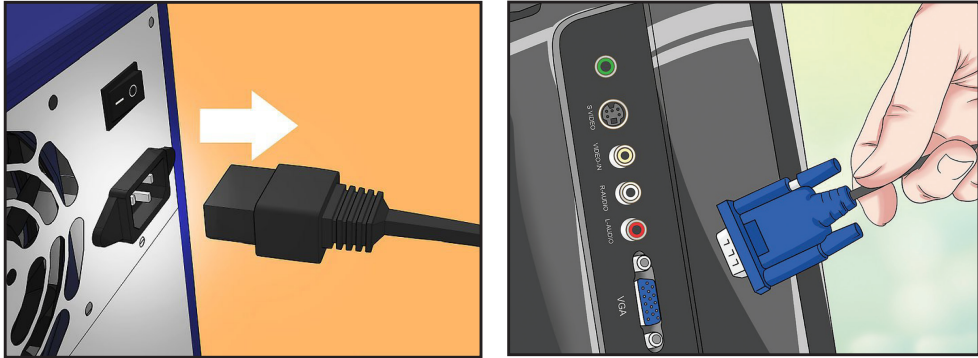
Step 3   Once all cables are connected, plug the power cable.
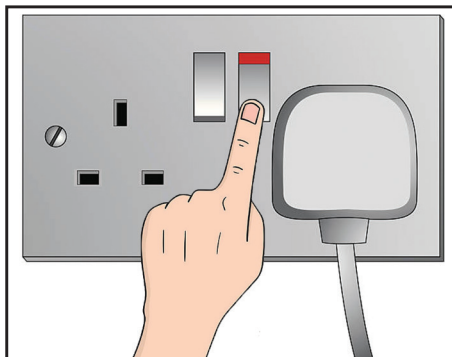
Step 4   After that, switch on the computer. Most likely, the computer will start. Otherwise seek technical assistance.

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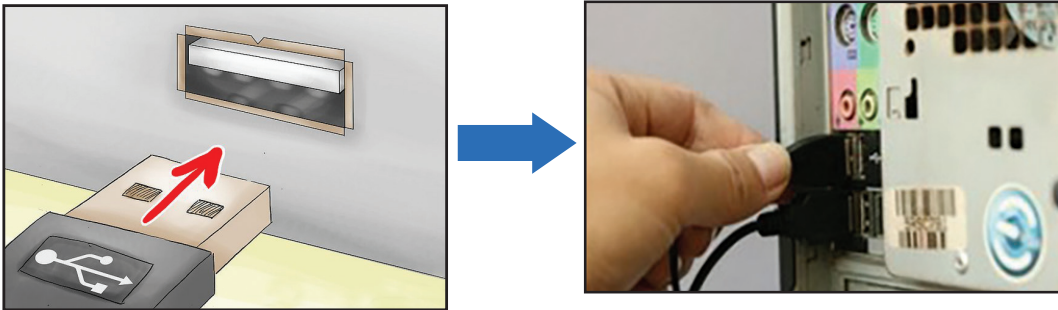
    ii. If the keyboard and the mouse have a PS/2 ports (old type), connect them with the PS/2 ports, properly.

      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
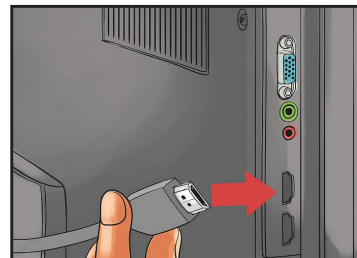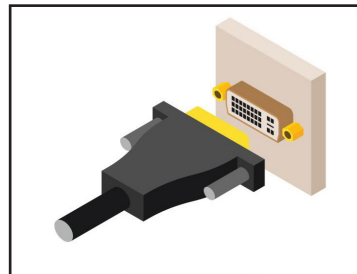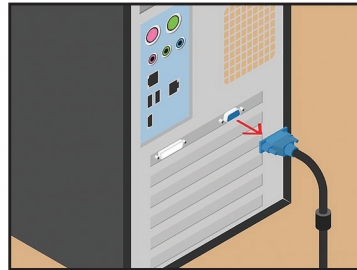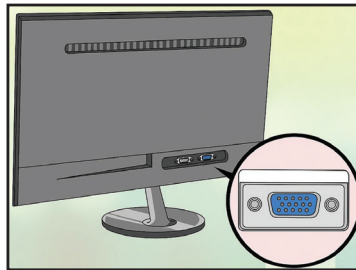
Step 4   Check the connectivity of the power supply cable to the monitor as shown in the following picture. If not, connect them properly.

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.
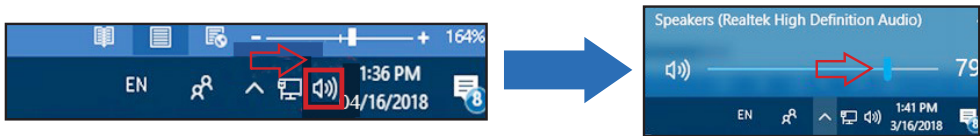
Step 3

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.

Digit Out
Microphone In
Analog Line in
Front Left/Right & Headphone
Center/Sub-woofer
Surround Left/Right
Surround Back Left/Right

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;

OPTICAL
DIGITAL
OUT
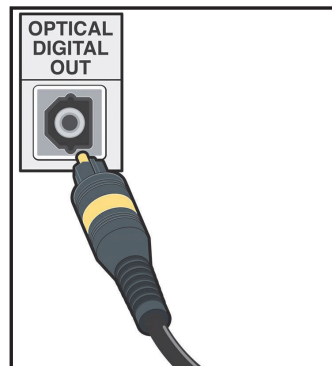
Step 4 Most sound systems require separate power supply. There is a cable attached to the speaker for this purpose. Check whether this cable is connected to a port for power. Otherwise, connect the cable for power supply.

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.
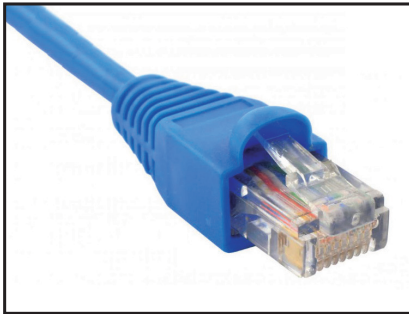
RJ45 Connector

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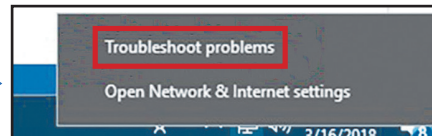
Note - In addition to network cables, there may be other settings to be set up. Permission for these settings has to be gained through a network administrator account. Therefore, you will need the assistance of your teacher to change such settings.

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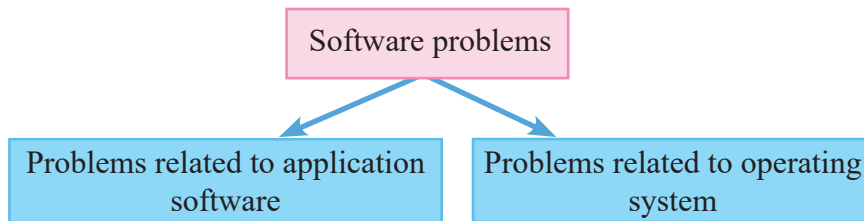
Figure 2.4 : Software problems

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 staring 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;

    a. Tablet mode
    b. 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. |
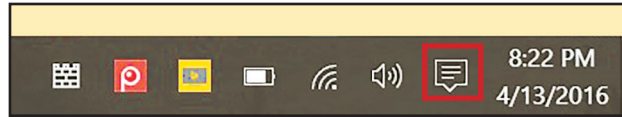
This option changes tablet mode to PC mode which makes the desktop icons visible.
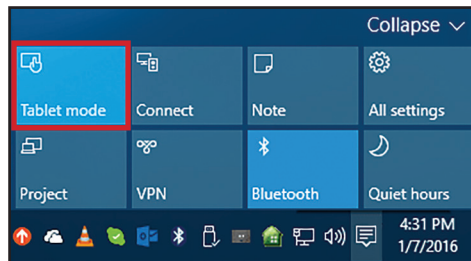
Solution 02 :

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.) |
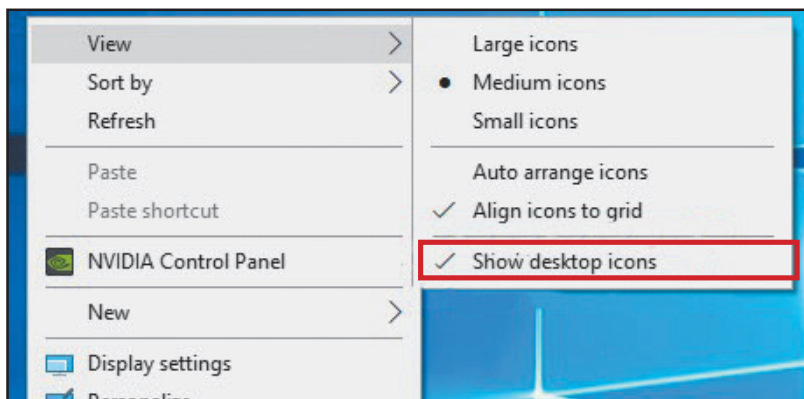
Solution 03 :

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.

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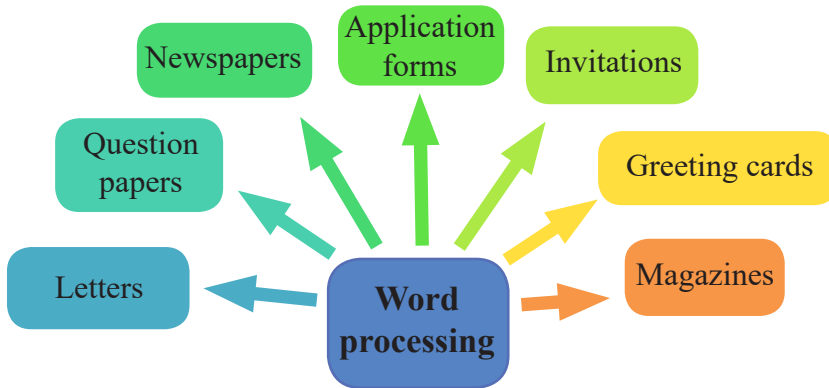
Figure 3.1 : Some documents that can be produced by using Word Processing software

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

Common tools

New
To open a new document

Open
To open a saved document

Print Preview
To preview document before printing

Save
To save a document

Save as
To save a document in a different name

Print
To print a document

Undo	Copy	Paste
To cancel an action	To copy text, images, etc.	To paste copied text, images, etc.

Redo	Cut	Spell check
To redo the cancelled action	To cut text, images, etc.	To check spellings and grammar in a word or a sentence

Text formatting tools

Size - (To change the size of fonts)
Topics
Sub-topics
General letter size

Bold
To darken the text

To Italic
(slanted text)

Color
Change colour of text

Subscript
To bring down from the text line (CO_2)

Font | 12 | **B** *I* U | ab | A | x₂ x²

Font - (letter types)
- Times New Roman
- Cambria
- Nirmala UI
- පරිසඛාමප්ඵයස

Underline
To underline text

Highlight
To draw attention to text

Superscript
To bring above the text line (2^2, 2^3)

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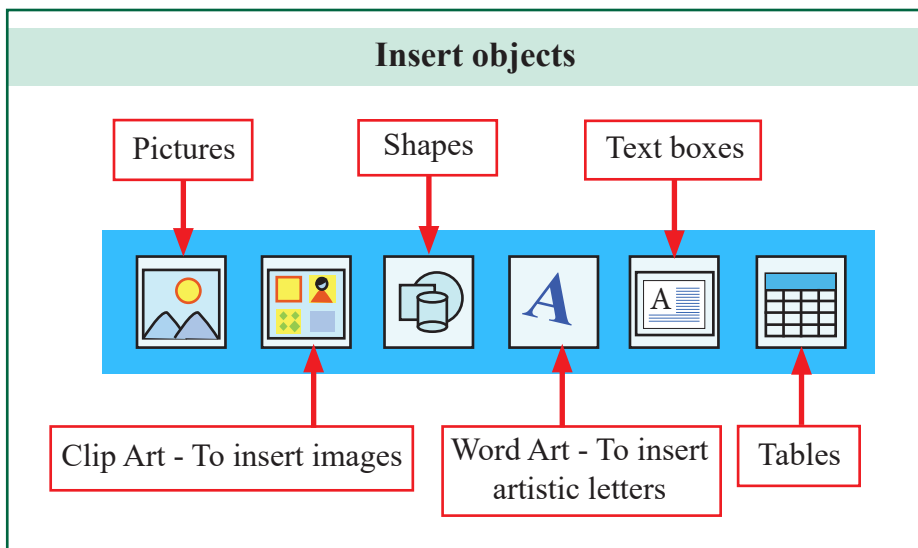
Refer to workbook for Activities 3.6, 3.7, 3.8, 3.9 and 3.10

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

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

process

Input :	Item description, number of items, unit price

Process :	For an item purchased;

	Amount	= number of items × unit price
	Total bill	= total price (amount) of all items purchased

Output :	Amount 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)
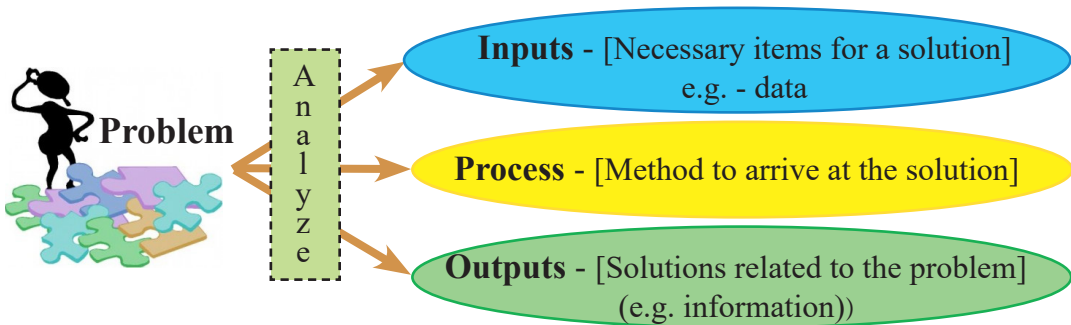

Figure 4.1 : Problem Analysis

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 × 5)
Output :	Total amount

Rs xx

Figure 4.2 : Pens

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.

control structures

1. Sequence

2. Selection

3. Repetition

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 ▭ symbol.

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.

Start

Input the *Price of a Pen*

Total = *Price of a Pen* × 5

Display *Total*

End
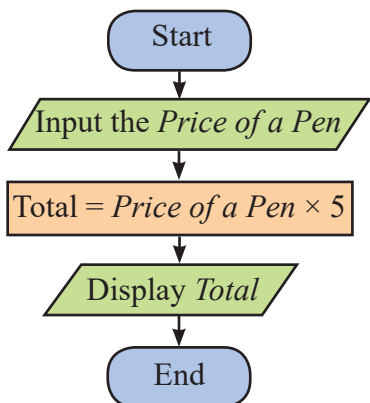
Flowchart 1 : finding cost of five pens
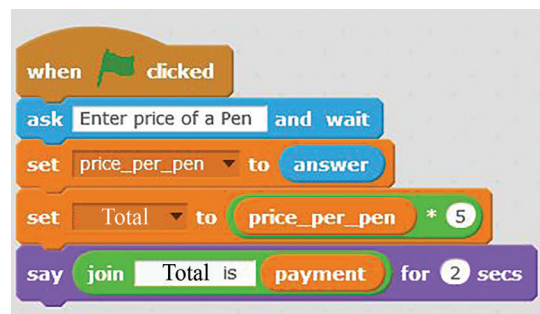
Scratch program 1: find the cost of 5 pens when the unit price is provided

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;
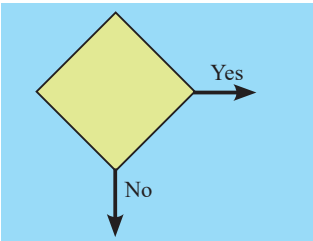
Figure 4.3 : Control structure
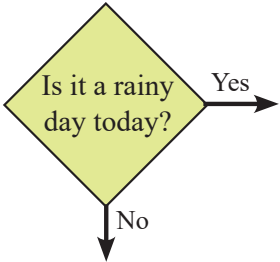
Figure 4.4 : Decision on whether it is a rainy day or not

Example 1   Indicate the above example in a flowchart.
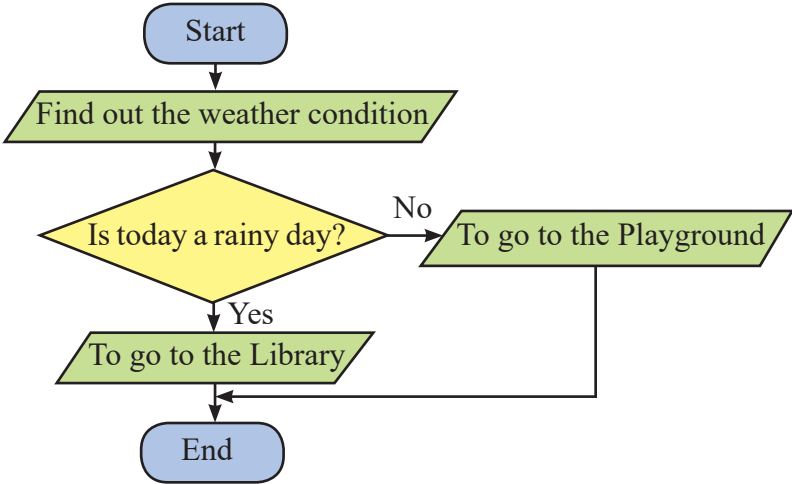
Flow chart 2 : Going to the playground or the library according to the weather condition

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).

Figure 4.5 : Snakes and Ladders Board

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.

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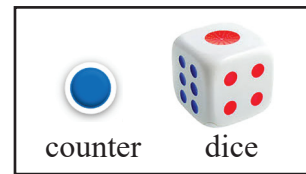
One has to follow these conditions and reach square 36 to become the winner.

Given below is the flowchart relevant to the above example.
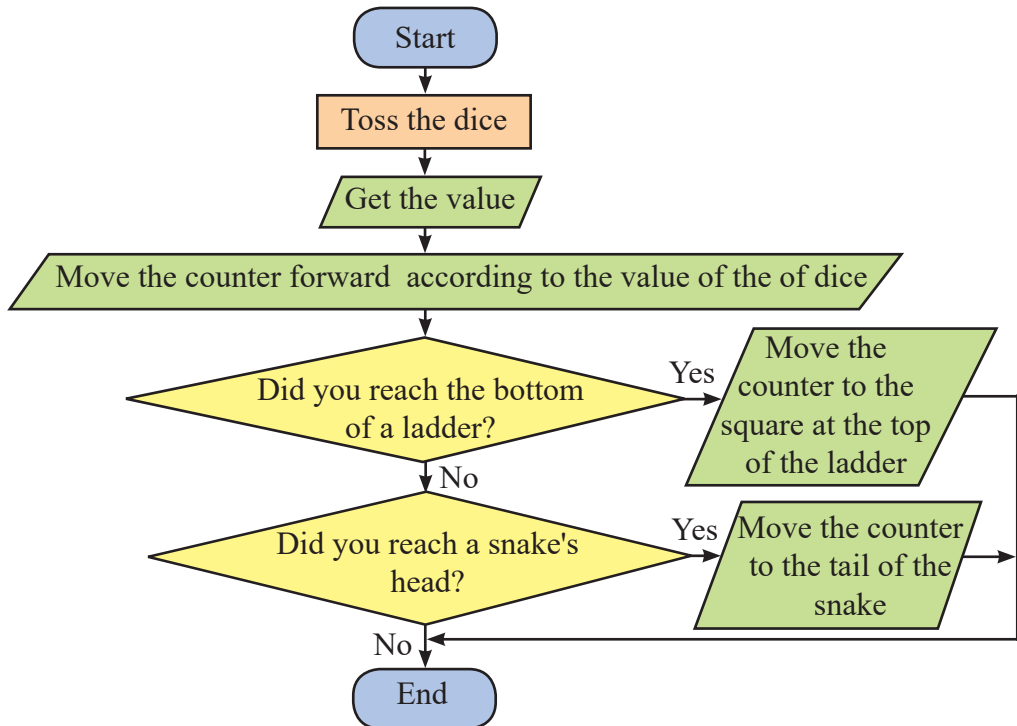
Flowchart 3 : Snakes and Ladders game

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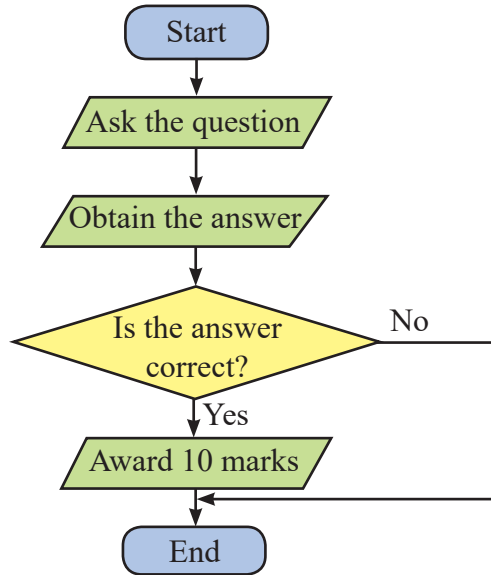
Flowchart 4 : Offering/Not offering marks for correct/incorrect answer

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).
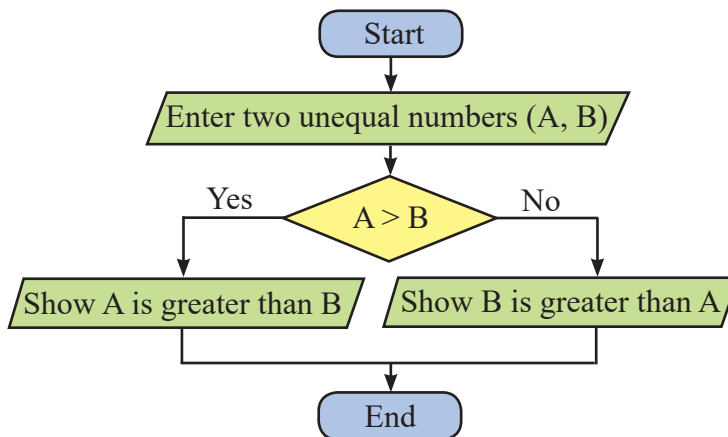
Flowchart 5 : Finding greater number

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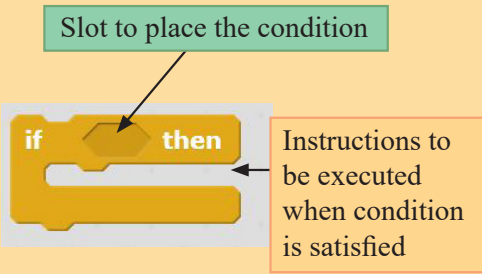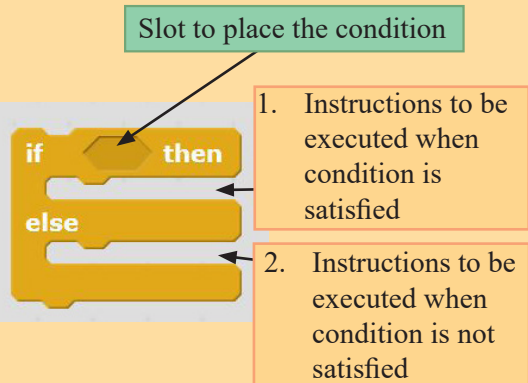
4.3 Selection control structures

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
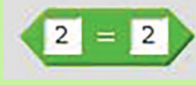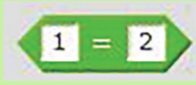
IF... THEN block	IF... THEN... ELSE... block

Slot to place the condition
 	
 if then
 	
 Instructions to be executed when condition is satisfied
	Slot to place the condition
	
	 if then
	 else
	
	 1. Instructions to be executed when condition is satisfied
	 2. Instructions to be executed when condition is not satisfied

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	1 < 2	True
	2 < 1	False
Check whether the value on the left equals to the right	2 = 2	True
	1 = 2	False
Check whether the value on the left is greater than the one on the right	2 > 1	True
	1 > 2	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
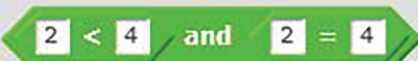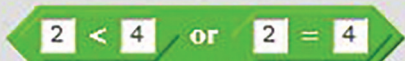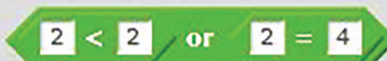
2. OR
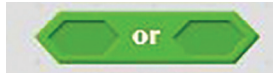
3. NOT

Table 3 : Logical blocks

Instruction	Example	Reply
and If both expressions on left and right are true only, the output is true.	2 < 4 and 2 = 2	True
	2 < 4 and 2 = 4	False
or If both expressions on left and right are true or if only one is true, the output is true.	2 < 4 or 2 = 4	True
	2 < 2 or 2 = 4	False
not If the expression is false, the output is true. If the expression is true, the output is false.	not 2 = 4	True
	not 2 < 4	False

Refer to workbook for Activity 4.5

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).

Scratch program 2 : Display account balance

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.

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

$13 \text{ MOD } 5 = 3$

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.
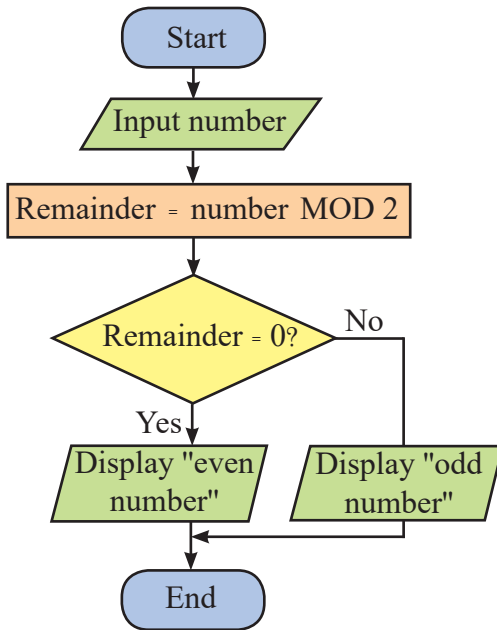
Flowchart 7 : Text whether a number is even/ odd

Scratch program 3 : 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).
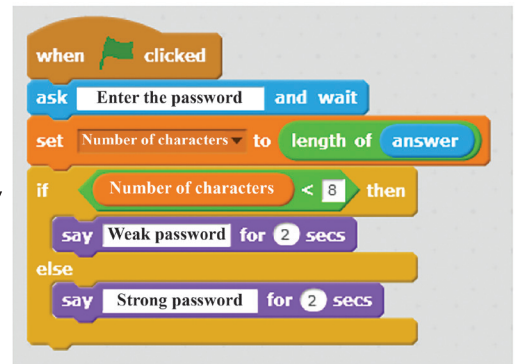
Scratch programming 4 : Display whether a password is weak or strong

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)
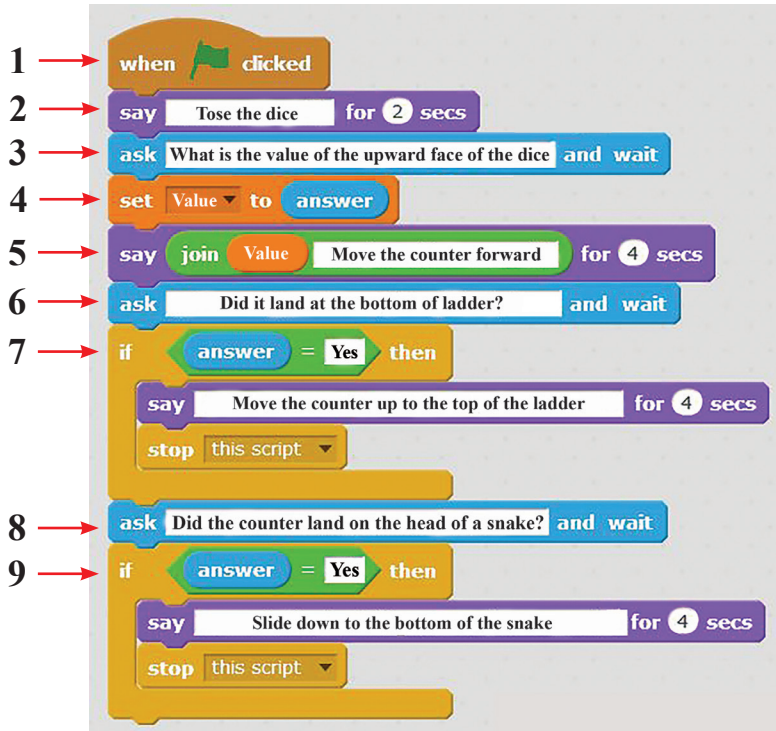
Scratch program 5 : Snakes and Ladder game

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.

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).
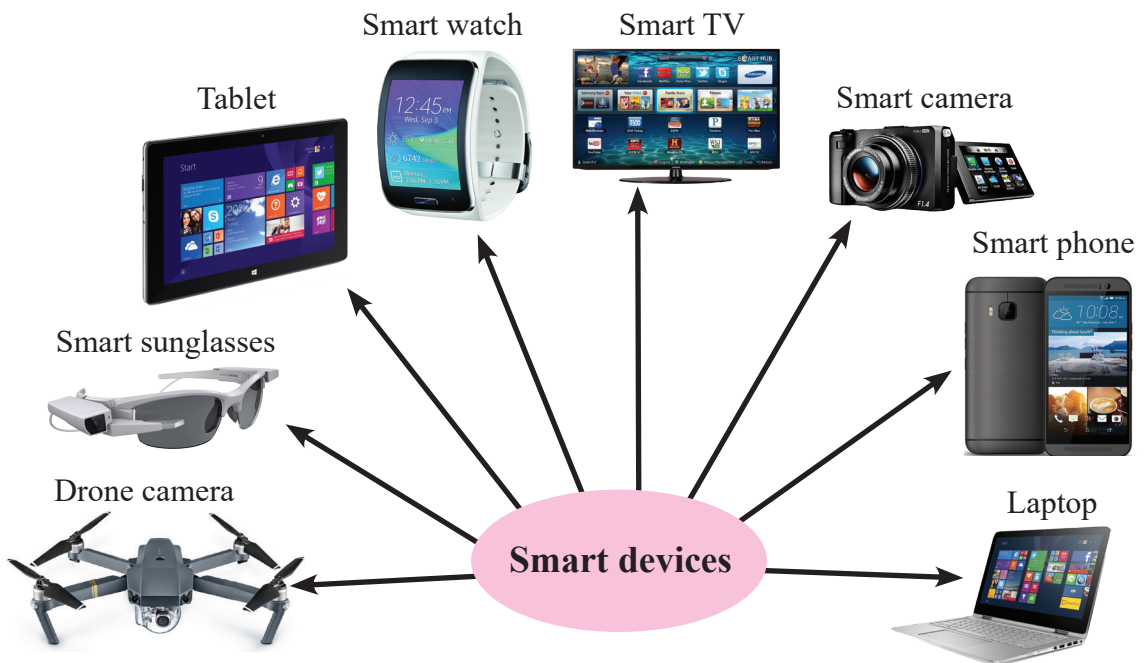
Figure 4.6 : Examples of mobile and smart devices

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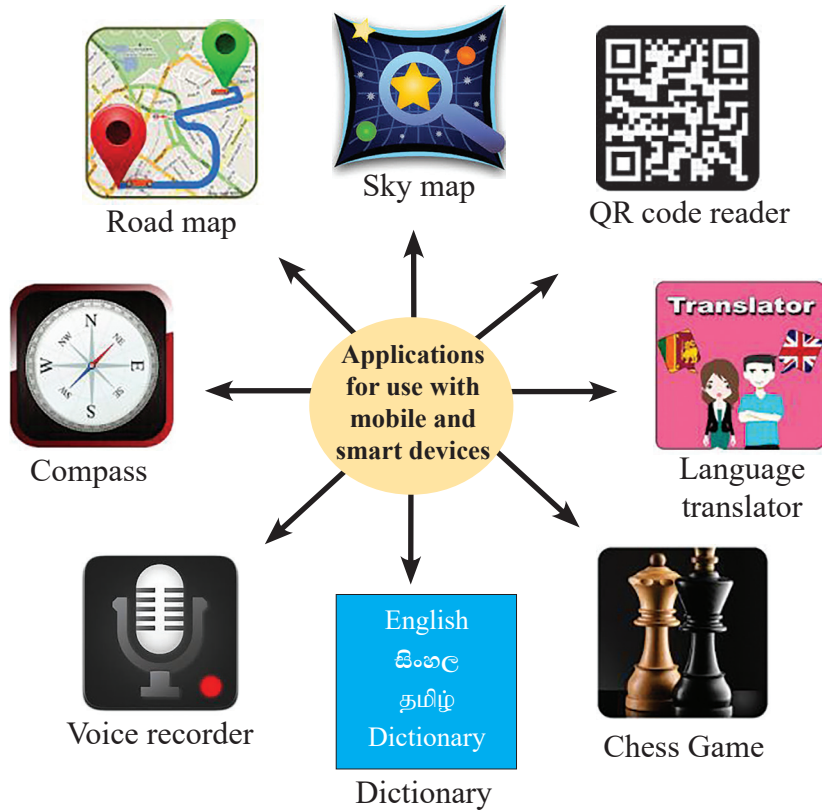
Figure 4.7 : Examples of the applications of mobile and smart devices

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 the one after the other.

- In selection, the program selects the cause of action based on whether condition is satisfied or not. Scratch programming uses "if then" and "if then else" control structures for selection.
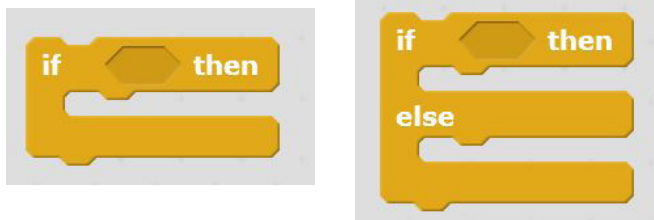
- Scratch uses three types of comparison blocks.

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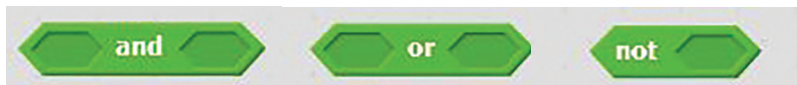
- The "Repetition" control structures, will be taught in a future lesson.

5 Physical Computing

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.
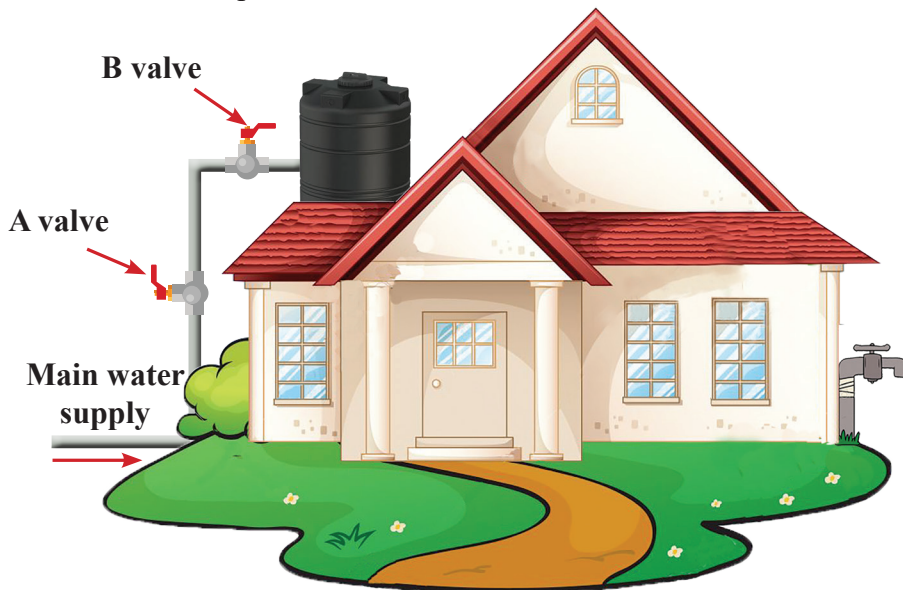
Figure 5.1 : Analogy for AND gate

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".
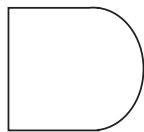
The standard symbol for AND Gate
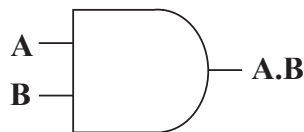
When A and B are inputs

Inputs of a Gate is shown in capital letters. The output of AND gate is denoted by A.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)
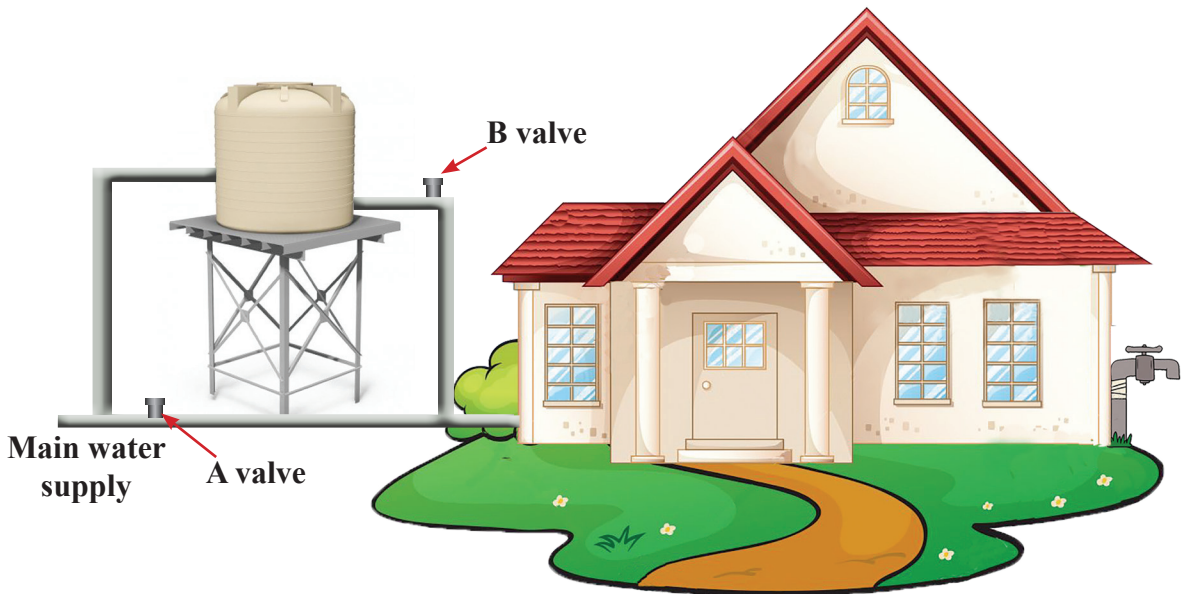
Figure 5.2 : An analogy for OR gate

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.
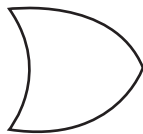
The standard symbol of the OR Gate
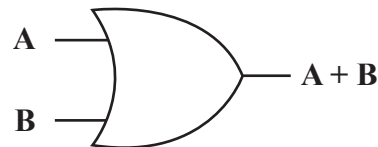
When A and B are inputs

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.

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;
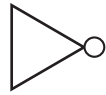
Standard Symbol of NOT gate   When A is its input
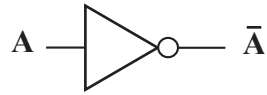
The above illustration shows a NOT gate in an electric circuit with A as input and $\overline{A}$ as output. The equivalent truth table is as follows;

A	$\overline{A}$
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
1 ▷ 0 ▷ 1	0 ▷ 1 ▷ 0
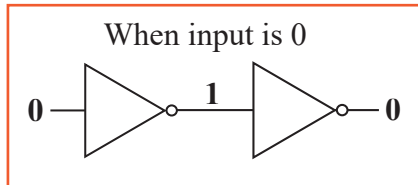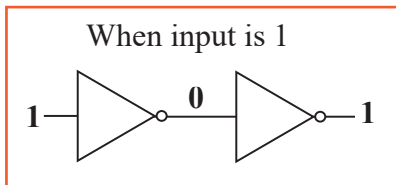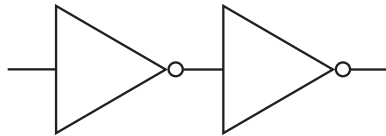
e.g. 2 - Obtaining the relevant output according to the input given.

In OR gate, the inputs are added to give the output $(1 + 0 = 1)$
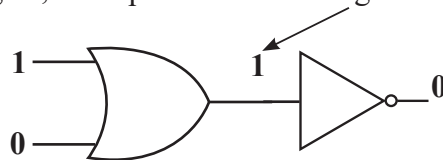
Refer to workbook for Activities 5.1, 5.2, 5.3 and 5.4

Note - Logic Gates

1. The basis 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 or1 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
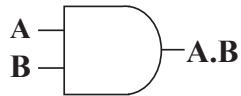
- Function of OR gate
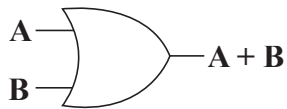
- Function of NOT gate
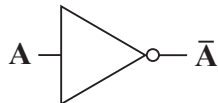
6 Internet

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
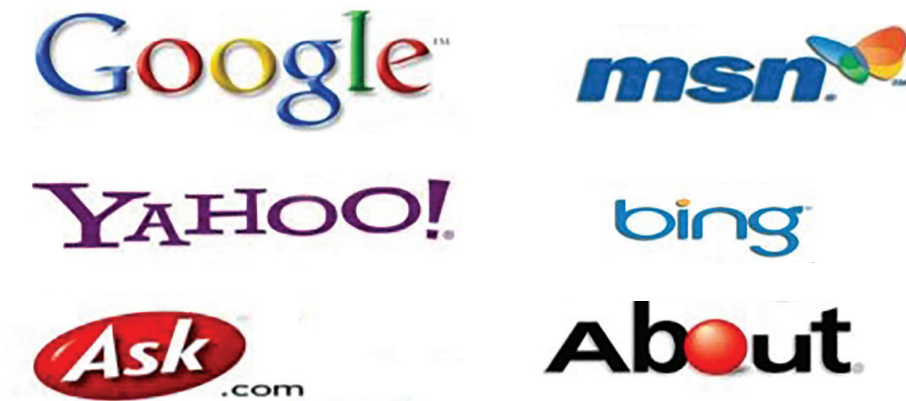
Figure 6.1 : A few main search engines

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.
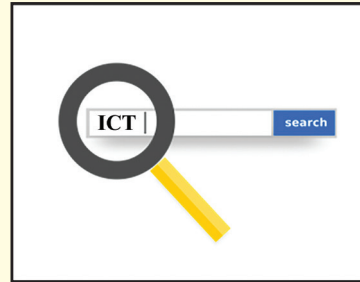
Browsing history

Search engines save recently used web addresses.

These websites can be accessed using the 'History'.
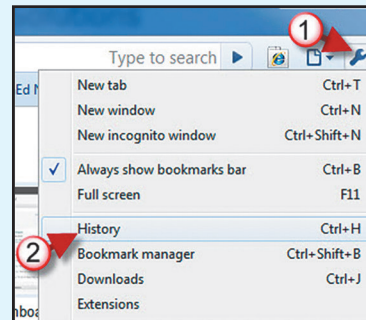
Bookmark/Favourite

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 an display in color. The mouse over a hyperlink shows icon of a hand.
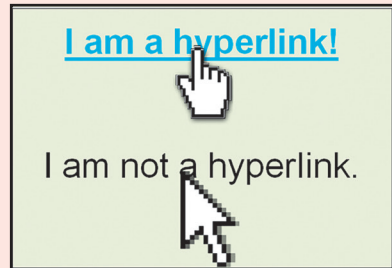
Forward/ Backward

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
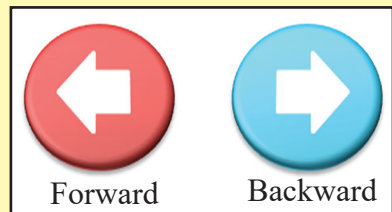
Tabs

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.

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
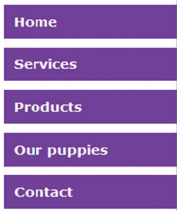
3
★ Design
  - Use of colours, letters and font size
  - Clarity and readability of the content

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
• 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:

Tag	Function
<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
<img src="….">	Insert an image
…	create a hyperlink

<title>…</title>

<h>...</h>

<i>…</i>

<p>

<img src="….">

Wonderful Benefits of Banana

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.

No	ඉංග්‍රීසි	සිංහල	දෙමළ
		ඉංග්‍රීසි-සිංහල-දෙමළ පාරිභාෂික ශබ්ද මාලාව.	
1.	abstract model	වියුක්ත ආකෘතිය	கருத்தியல் மாதிரி
2.	acceptance testing	ප්‍රතිග්‍රහණ පරීක්ෂාව	ஏற்புச் சோதனை
3.	access privilege	ප්‍රවේශවීමේ වරප්‍රසාදය	அணுகல் உரிமை
4.	agile model	සුචලන ආකෘතිය	சுறுசுறுப்பு மாதிரி
5.	alternate key	විකල්ප යතුර	மாற்றுச் சாவி
6.	American Standard Code for Information Interchange (ASCII)	තොරතුරු හුවමාරුව සඳහා වූ ඇමරිකානු සම්මත කේතය	தகவல் இடைமாற்றுக்கான அமெரிக்க நியம விதிக்கோவை
7.	amplitude	විස්තාරය	வீச்சம்
8.	amplitude modulation	විස්තාර මූර්ජනාව	வீச்சப் பண்பேற்றம்
9.	analog	ප්‍රතිසම	ஒப்புமை
10.	anchor	රැඳවුම	நிலை நிறுத்தி
11.	application layer	අනුප්‍රයෝග ස්ථරය	பிரயோக அடுக்கு
12.	architecture	නිර්මිතය	கட்டமைப்பு
13.	arithmetic and logical unit (ALU)	අංක ගණිත හා තාර්කික ඒකකය	எண்கணித மற்றும் தர்க்க அலகு
14.	array	අරාව	அணி
15.	artificial intelligence	කෘතිම බුද්ධිය	செயற்கை நுண்ணறிவு
16.	Affective computing	බුද්ධිමත් සහ චිත්තවේගී පරිගණනය	நுண்ணறிவு உணர்திறன்மிக்க கணித்தல்
17.	associative law	සංඝටන න<මූ>ාය	கூட்டு விதி
18.	attenuation	වැහැරීම/භායනය	நொய்மை
19.	attribute	උපලැකිය /ගුණය/ උපලක්ෂණය	பண்புகள்
20.	authoring tool	සම්පාදන මෙවලම	படைப்பாக்கக் கருவி
21.	Automated Teller Machine (ATM)	ස්වයංකෘත මුදල් ගනුදෙනු යන්ත්‍රය	தானியங்கிப் பணம் கையாள் இயந்திரம்

22.	autonomous	ස්වයංපාලක/ ස්වතන්ත්‍ර/ස්වායත්ත	சுயாதீன
23.	axiom	ස්වසිද්ධිය/ප්‍රත්‍යක්ෂය	வெளிப்படை உண்மை
24.	backups	උපස්ථ	காப்பெடுத்தல்
25.	bandwidth	කලාප පළල/බඳස් පළල	பட்டை அகலம்
26.	batch processing	කාණ්ඩ සැකසුම	தொகுதி முறைவழியாக்கம்
27.	big data	මහා දත්ත	பெரிய தரவு
28.	binary	ද්වීමය	துவிதம், இருமம்
29.	binary coded decimal (BCD)	ද්වීමය කේතික දශමය	இருமக் குறிமுறை தசமம்
30.	bio-inspired computing	ජෛව ප්‍රේරිත පරිගණනය/ ජෛව අනුප්‍රේරිත පරිගණනය	உயிரியல் உள்ளீர்ப்புக் கணிப்பு
31.	bit coin	බිටු කාසි	நுண்கடன் பணம் செலுத்தல்
32.	bitwise	බිටු අනුසාරිත	பிட் வாரி
33.	bitwise logical operation	බිටු අනුසාරිත තාර්කික මෙහෙයුම්	பிட் வாரி தர்க்கச் செயற்பாடு
34.	black box testing	කාල මංජුසා පරීක්ෂාව	கறுப்புப்பெட்டிச் சோதிப்பு
35.	blogging	වෙබ් සටහනය	வலைப்பதிவிடல்
36.	boot–up	ප්‍රවේශනය	தொடங்குதல்
37.	broadcasting	විකාශනය	தொலைபரப்பல்
38.	browsing	අතරික්සීම	மேலோடல்
39.	bubble sort	බුබුළු තේරීම/ යා-සැසඳුම් තේරීම	குமிழி வகைப்படுத்தல்
40.	built-in	තුළබැඳි / තිළැලි	உட்பொதிந்த
41.	business process re-engineering (BPR)	ව්‍යාපාර ක්‍රියාවලියේ ප්‍රති ඉංජිනේරුකරණය	வணிக செயல்முறை மீள்கட்டமைப்பு
42.	candidate key	නිරූපඅ යතුර	பிரதிநிதித்துவச் சாவி
43.	cardinality	ගණනීයතාව	எண்ணளவை
44.	cathode ray tube (CRT)	කැතෝඩ් කිරණ නලය	கதோட்டுக் கதிர் குழாய்

45.	central processing unit (CPU)	මධ්‍ය සැකසුම් ඒකකය	மத்திய செயற்பாட்டு அலகு
46.	characteristics	ගති ලක්ෂණ / ස්වලක්ෂණ	சிறப்பியல்புகள்
47.	check box	සලකුණු කොටුව	சரிபார்ப்புப் பெட்டி
48.	client-server model	සේවා යෝජක-සේවා දායක ආකෘතිය	சேவைப் பயனர் மாதிரி
49.	clock	ස්පන්දකය	கடிகாரம்
50.	cloud computing	වලාකුළු පරිගණනය	மேகக் கணிமை
51.	coaxial cable	සමක්ෂක කේබලය	ஓரச்சு வடம்
52.	code editor	කේත සංස්කාරක	குறிமுறை தொகுப்பி
53.	comment	විවරණය	விளக்கக் குறிப்பு
54.	commutative law	නෳායදේශ නෳාය	பரிமாற்று விதி
55.	compact disc	සුසංහිත ඩිස්කය	ஒளியியல் வட்டு
56.	compatibility	ගැළපුම්	பொருந்துகை
57.	compiler	සම්පාදකය	தொகுப்பான்
58.	component	සංරචකය	கூறு
59.	composite key	සංයුක්ත යතුර	கூட்டுச் சாவி
60.	constant	නියතය	மாறிலி
61.	content management system (CMS)	අන්තර්ගත කළමනාකරණ පද්ධතිය	உள்ளடக்க முகாமைத்துவ முறைமை
62.	context switching	සන්දර්භ සුවිච්නය	சந்தர்ப்ப நிலைமாற்றல்
63.	contiguous allocation	යාබද විභාජනය	அடுத்தடுத்தான ஒதுக்கீடு
64.	control structure	පාලන වෳූහය	கட்டுப்பாட்டுக் கட்டமைப்பு
65.	control unit (CU)	පාලන ඒකකය	கட்டுப்பாட்டலகு
66.	credit card	ණයපත	கடனட்டை
67.	customization	අභිරුචිකරණය	தனிப்பயனாக்கல்
68.	data	දත්ත	தரவு
69.	data and control bus	දත්ත සහ පාලන පථ	தரவும் கட்டுப்பாட்டுப் பாட்டையும்

70.	database management system (DBMS)	දත්ත සමුදාය කළමනාකරණ පද්ධති	தரவுத்தள முகாமைத்துவ முறைமை
71.	data definition language (DDL)	දත්ත නිර්වචන භාෂාව	தரவு வரையறை மொழி
72.	data dictionary	දත්ත ශබ්දකෝෂය	தரவு அகராதி
73.	data flow diagram	දත්ත ගැලීම් සටහන	தரவு பாய்ச்சல் வரைபடம்
74.	data flow model (DFM)	දත්ත ගැලීම් ආකෘතිය	தரவு பாய்ச்சல் மாதிரி
75.	data link layer	දත්ත සබැඳි ස්ථරය	தரவு இணைப்பு அடுக்கு
76.	data manipulating language (DML)	දත්ත හැසුරුම් බස	தரவு கையாளல் மொழி
77.	data migration	දත්ත පරියටනය	தரவு பெயர்ச்சி
78.	debugging	නිදොස් කිරීම	வழு நீக்கல்
79.	decision support system (DSS)	තීරණ සහාය පද්ධති	தீர்மான உதவு முறைமை
80.	declarative	ප්‍රකාශාත්මක	அறிவிப்பு
81.	default values	පෙරනිම් අගය	இயல்புநிலை மதிப்பு
82.	defragmentation	ප්‍රතිඛණ්ඩනය	துணிக்கை நீக்கல்
83.	demodulation	විමුර්ජනය	பண்பிறக்கம்
84.	device	උපාංගය / උපකුමය	சாதனம்
85.	device driver	උපාංග ධාවක මෘදුකාංග	சாதனச் செலுத்தி
86.	digital	අංකිත	இலக்க முறை
87.	digital camera	අංකිත කැමරාව	இலக்கமுறைப் படக்கருவி
88.	digital economy	අංකිත ආර්ථිකය	இலக்கமுறைப் பொருளாதாரம்
89.	digitizer	සංඛ්‍යාතකය	இலக்கமாக்கி
90.	direct implementation	සෘජුස්ථාපනය	நேரடி அமுலாக்கம்
91.	disk formatting	තැට්/ඩිසක හැඩසවි ගැන්වීම	வட்டு வடிவமைப்பு
92.	distortion	විකෘතිය	திரிபு

93.	distributive law	විසටන නහාය	பங்கீட்டு விதி
94.	document flow diagram	ලේඛන ගැලීම් සටහන	ஆவணப் பாய்ச்சல் வரைபடம்
95.	domain	වසම	ஆள்களம்
96.	domain name server (DNS)	වසම් නාම සේවාදායකය	ஆள்களப் பெயர் சேவையகம்
97.	domain name system (DNS)	වසම් නාම පද්ධතිය	ஆள்களப் பெயர் முறைமை
98.	dynamic host configuration protocol (DHCP)	ගතික ධාරක පාලන නියමාවලිය	மாறும் விருந்தோம்பி உள்ளமைவு நெறிமுறை
99.	dynamic web page	ගතික වෙබ් පිටු	இயக்குநிலை வலைப்பக்கம்
100.	e-commerce	විදූුත් වාණිජ්‍යය	மின் வர்த்தகம்
101.	economical feasibility	ආර්ථික ශකයතාව	பொருளாதாரச் சாத்தியப்பாடு
102.	elementary process description(EPD)	මූලික ක්‍රියාවලි විස්තරය	அடிப்படைச் செய்முறை விபரிப்பு
103.	e-market place	ඉ-වෙළඳ පොළ	இலத்திரனியல் சந்தை இடம்
104.	encryption	ගුප්ත කේතනය	மறைகுறியாக்கம்
105.	enterprise resource planning system (ERPS)	ව්‍යවසාය සම්පත් සැලසුම් පද්ධතිය	நிறுவன மூலவள திட்டமிடல் முறைமை
106.	entity	භූතාර්ථය/අභිභූතත්වය/සත්තාව	நிலைபொருள்
107.	entity identifier	භූතාර්ථ/අභිභූතත්වය හඳුන්වනය	நிலைபொருள் அடையாளங்காட்டி
108.	entity relationship(ER) diagram	භූතාර්ථ සම්බන්ධතා රූපසටහන	நிலைபொருள் உறவுமுறை அட்டவணை
109.	executable	ක්‍රියාත්මක කළ හැකි	இயக்கத்தகு
110.	executive support system (ESS)	විධායක සහාය පද්ධතිය	நிறைவேற்று உதவு முறைமை
111.	expert system	විශේෂඥ පද්ධතිය	நிபுணத்துவ முறைமை

112.	extended binary coded decimal interchange cod (EBCDIC)	විස්තෘත ද්වීමය කේතක දශම	நீடித்த துவித குறிமுறை தசம இடமாற்றக் குறி
113.	extended entity relationship (ER) diagram	විස්තෘත භූතාර්ථ සම්බන්ධතා රූප සටහන	விரிவாக்கப்பட்ட நிலைபொருள் உறவுமுறை அட்டவணை
114.	feasibility study	ශක්‍යතා අධ්‍යනය	சாத்தியப்பாடு கற்கை
115.	feedback loop	ප්‍රතිපෝෂණ ලූපය	பின்னூட்டல் வளையம்
116.	fetch-execute cycle	ආහරණ-ක්‍රියාකරවුම් චක්‍රය	தருவிப்பு நிறைவேற்றுச் சுழற்சி
117.	fiber optic	ප්‍රකාශ තන්තු	இழை ஒளியியல்
118.	file	ගොනුව	கோப்பு
119.	file hierarchy	ගොනු ධුරාවලිය	கோப்பு படிநிலை
120.	firewall	ගිනි පවුර	தீச்சுவர்
121.	normal form	ප්‍රථම ප්‍රමත අවස්ථාව	இயல்பாக்கல் வடிவம்
122.	fixed internal hard disk	අචල අභ්‍යන්තර දෘඪ තැටි	நிலையான உள்ளக வன்தட்டு
123.	flash memory	සැණ/ ක්ෂණික මතකය	பளிச்சீட்டு நினைவகம்
124.	flash memory card	සැණ/ ක්ෂණික මතක පත	பளீச்சிட்டு நினைவக அட்டை
125.	flat file system	ඒක ගොනු පද්ධතිය	சமதளக் கோப்பு முறைமை
126.	flip-flop	පිළි-පොළ	எழு-விழு
127.	float	ඉපිලීම/ඉපිලීම	மிதவை
128.	floppy disk	නම්‍ය තැටිය	நெகிழ் வட்டு
129.	flow chart	ගැලීම් සටහන	பாய்ச்சற் கோட்டுப்படம்
130.	folder	ගොනු බහලුම	கோப்புறை
131.	foreign key	ආගන්තුක යතුර	அந்நியச்சாவி
132.	formatting	හැඩසවි ගැන්වීම	வடிவமைத்தல்
133.	frame	රාමුව	சட்டகம்
134.	frequency modulation	සංඛ්‍යාත මූර්ජනය	அதிர்வெண் பண்பேற்றல்

135.	full adder	පූර්ණාකලකය	முழுமைக் கூட்டி
136.	function	ශ්‍රිතය / කාර්යය	சார்பு
137.	functional dependency	කාර්ය බද්ධ පරායත්තතාව	செயல் சார்புநிலை
138.	functional requirement	කාර්ය බද්ධ අවශ්‍යතාව	செயல்படு தேவை
139.	quantum computing	ක්වොන්ටම් පරිගණනය	சொட்டு கணிப்பு அடிப்படை
140.	gateway	දොරටු මඟ / වාසල් ද්වාරය /වාහල්දොර	நுழைவாயில்
141.	genetic algorithm	සහජ ඇල්ගොරිදමය	மரபணு வழிமுறை
142.	geographical information system(GIS)	භූගෝලීය තොරතුරු පද්ධතිය /මිහිතැන් තොරතුරු පද්ධතිය	புவியியல் தகவல் முறைமை
143.	graph plotter	ප්‍රස්තාර ලකුණුකරණය	படவரையி
144.	graphic tablet	චිත්‍රකඵලකය	வரைவியல் விவரமாக்கி
145.	grid computing	ජාලක පරිගණනය	கோட்டுச்சட்டகக் கணிமை
146.	guided media	නියමු මාධ්‍ය	வழிபடுத்தப்பட்ட ஊடகம்
147.	half adder	අර්ධාකලකය	அரை கூட்டி
148.	hand trace	හස්තානුරේඛනය	கைச் சுவடுகள்
149.	hard disk	දැඩ් තැටිය / දෘඪ ඩිස්කය	வன்தட்டு
150.	hardware	දෘඪාංග	வன்பொருள்
151.	hexadecimal	ෂඩ් දශමය	பதினறுமம்
152.	hierarchical model	ධූරාවලි ආකෘතිය	படிநிலை மாதிரி
153.	host	සත්කාරකය	விருந்தோம்பி
154.	hub	නාභිය	குவியன்
155.	human operator	මිනිස්ක්‍රියාකරුවෝ	மனித இயக்குபவர்
156.	hybrid approach	දෙමුහුන් ප්‍රවේශය	கலப்பு அணுகல்
157.	hyperlink	අධිසම්බන්ධකය	மீ இணைப்பு
158.	Integrated circuits (IC)	අනුකලිත පරිපථ	ஒருங்கிணைந்த சுற்று
159.	icon	නිරූපකය	சிறு படம்

160.	identity	සර්වසාම්ය	அடையாளம்
161.	image	රූපය	படிமம்
162.	imperative	විධානාත්මක	கட்டளை
163.	incremental	වර්ධනාත්මක	ஏறுமான, அதிகரிப்பு
164.	indexed allocation	අනුක්‍රමික විභාජනය	சுட்டி ஒதுக்கீடு
165.	information	තොරතුරු	தகவல்
166.	inkjet printer	තීන්ත විදුම් මුද්‍රකය	மை-தாரைஅச்சுப்பொறி
167.	instant messaging	ක්ෂණික පණිවුඩ යැවීම	உடனடிச் செய்தியிடல்
168.	integrated development environment(IDE)	සමෝධානික සංවර්ධන පරිසරය	ஒருங்கிணைந்த விருத்தி சூழல்
169.	integration test	අනුකලන පරීක්ෂණය	ஒருங்கிணைந்த சோதிப்பு
170.	intelligent and emotional computing	බුද්ධිමත් සහ චිත්තවේගී පරිගණනය	நுண்ணறிவும் உணர்திறனுமிக்க கணித்தல்
171.	interface	අතුරු මුහුණ	இடைமுகம்
172.	internet service provider(ISP)	අන්තර්ජාල සේවය සපයන්නා	இணையச் சேவை வழங்குநர்
173.	interpreter	අර්ථවිනාසකය	மொழிமாற்றி
174.	interrupt	අතුරු බිඳුම	இடையூறு
175.	intranet	අන්ත:ජාලය/ අන්තෝජාල	அகவிணையம்
176.	internet of things (IoT)	**සාර්ව ද්‍රව්‍ය අන්තර්ජාලය/** සබැඳි ද්‍රව්‍ය අන්තර්ජාල	பொருட்களின் இணையம்
177.	iteration	පුනර්කරණය	மீள் செயல்
178.	karnaugh map	කානෝ සිතියම	கானோ வரைபடம்
179.	knowledge management system(KMS)	දැනුම් කළමනාකරණ පද්ධතිය	அறிவு முகாமைத்துவ முறைமை
180.	large scale integration (LSI)	විශාල පරිමාණයේ අණුකලනය	பாரிய அளவு ஒருங்கிணைப்பு
181.	latency	පමාව/ගුප්තතාව	மறைநிலை

182.	least significant	අඩුමවෙසෙසි	சிறும மதிப்பு
183.	legend	විස්තර පාඨය	குறி விளக்கம்
184.	life cycle of data	දත්ත ජීවන චක්‍රය	தரவு வாழ்க்கை வட்டம்
185.	light emitting diode(LED) display	ආලෝක විමෝචක ඩයෝඩ සන්දර්ශකය	ஒளிகாலும் இருவாயித் திரை / ஒளி உமிழும் இரு முனையம்
186.	linked allocation	සබැඳි විභාජනය	இணைப்பு ஒதுக்கீடு
187.	linker	සන්ධාරකය	இணைப்பி
188.	liquid crystal display(LCD)	ද්‍රවස්ඵටික සන්දර්ශකය	திரவப்பளிங்குக் கணினித் திரை
189.	list	ලැයිස්තුව	பட்டியல்
190.	liveware	ජීවාංග	உயிர் பொருள்
191.	local publishing	ස්ථානීය ප්‍රසිද්ධ කිරීම	உள்ளக வெளியீடு
192.	local area network (LAN)	ස්ථානීය ප්‍රදේශ ජාලය	இடத்துரி வலையமைப்பு
193.	logic gate	තාර්කික ද්වාරය	தர்க்கப் படலை
194.	Logical Data Modeling(LDM)	තාර්කික දත්ත ආකෘතිකරණය	தர்க்கத் தரவு மாதிரியுருவாக்கல்
195.	logical data structure	තාර්කික දත්ත ව්‍යූහය	தர்க்கத் தரவுக் கட்டமைப்பு
196.	logical design tools	තාර්කික සැලසුම් මෙවලම්	தர்க்க வடிவமைப்புக் கருவி
197.	looping	ලූපනය	வளைய வரல்
198.	machine code	යන්ත්‍ර කේතය	இயந்திரக் குறியீடு
199.	machine-machine coexistence	යන්ත්‍ර-යන්ත්‍ර සහපැවැත්ම	இயந்திர- இயந்திர ஒருங்கிருத்தல்
200.	magnetic ink character reader(MICR)	චුම්බකිත තීන්ත අනු ලකුණු කියවනය	காந்த மை எழுத்துரு வாசிப்பான்
201.	magnetic stripe reader	චුම්බක තීරු කියවනය	காந்தப்பட்டி வாசிப்பான்
202.	magnetic tape	චුම්භක පටිය	காந்த நாடா
203.	malware	අනිෂ්ඨ මෘදුකාංග	தீம்பொருள்

204.	management information system (MIS)	කළමනාකරණ තොරතුරු පද්ධතිය	முகாமைத்துவ தகவல் முறைமை
205.	man-machine coexistence	මිනිස්-යන්ත්‍ර සහපැවැත්ම	மனிதன் - இயந்திரம் ஒருங்கிருத்தல்
206.	media access control (MAC)	මාධ්‍ය ප්‍රවේශ පාලක	ஊடக அணுகல் கட்டுப்பாடு
207.	memory management unit(MMU)	මතක කළමනාකරණ ඒකකය	நினைவக முகாமைத்துவ அலகு
208.	mesh topology	බැඳි ස්ථලකය	கண்ணி இடத்தியல்
209.	microprocessor	ක්ෂුද්‍ර සකසනය	நுண்செயலி
210.	microwave	ක්ෂුද්‍ර තරංග	நுண்ணலை
211.	mini disk	කුඩා තැටිය	சிறு வட்டு
212.	mobile computing	ජංගම පරිගණනය	செல்லிடக் கணிமை
213.	mobile marketing	ජංගම අලෙවිකරණය	செல்லிடச் சந்தைப்படுத்தல்
214.	modularization	මොඩියුලකරණය	கூறு நிலையாக்கம்
215.	modulation	මූර්ජනය	பண்பேற்றம்
216.	most significant	වැඩිම වෙසෙසි	அதியுயர் மதிப்பு
217.	mother board	මවු පුවරුව	தாய்ப்பலகை
218.	multi agent systems	බහු කාරක පද්ධති	பல்முகவர் முறைமை
219.	multi user-multi task	බහු පරිශීලක - බහු කාර්යය	பற்பயனர்-பற்பணி
220.	multi-core processors	බහු හර සකසන	பல்கரு செயலி
221.	multimedia objects	බහු මාධ්‍ය වස්තූ	பல்லூடக பொருள்
222.	multiplexer	බහු පථකාරකය	பல்சேர்ப்பி
223.	multiplexing	බහු පථකරණය	பல்சேர்ப்பு
224.	multiprocessing	බහු සැකසුම	பன்முறைவழியாக்கி
225.	multitasking	බහුකාර්ය කිරීම	பற்பணி
226.	multi-threading	බහු-අනුත්‍රීයායනය	பல் செயல்கூறு
227.	nature inspired	ප්‍රකෘති ප්‍රේරිත පරිගණනය/	இயற்கை உள்ளீர்ப்புக்

	computing	ප්‍රකෘති අනුප්‍රේරිත පරිගණනය	கணிப்பு
228.	nested loop	නීඩිත ලූපය	நீடித்த வளையம்
229.	network addresses translating (NAT)	ජාල යොමු පරිවර්තනය	வலையமைப்பு முகவரி பெயர்ப்பு
230.	network architecture	ජාල නිර්මිතය	வலையமைப்புக் கட்டமைப்பு
231.	network layer	ජාල ස්ථරය	வலையமைப்பு அடுக்கு
232.	network model	ජාල ආකෘතිය	வலையமைப்பு மாதிரி
233.	neural network	ස්නායුක ජාලය	நரம்பியல் வலையமைப்பு
234.	non-functional requirement	කාර්යබද්ධ නොවන අවශ්‍යතාව	செயல்சாராத் தேவைகள்
235.	normalization	ප්‍රමිතකරණය	இயல்பாக்கல்
236.	null	අභිශූන්‍ය	வெற்று
237.	object code	වස්තු කේත/	பொருள் குறி
238.	object oriented	වස්තු නැඹුරු / පාදක	பொருள் நோக்குடைய
239.	object- relational model	වස්තු-සම්බන්ධක ආකෘතිය	பொருள் உறவுநிலை மாதிரி
240.	octal	අෂ්ටමය	எண்மம்
241.	office automation system (OAS)	කාර්යාල ස්වයංකරණ පද්ධතිය	அலுவலகத் தன்னியக்க முறைமை
242.	offline	මාර්ග අපගත/ මාර්ගගත නොවන	தொடரறு நிலை
243.	one's compliment	එකෙහි අනුපූරකය	ஒன்றின் நிரப்பி
244.	online	මාර්ගගත	தொடரறா நிலை
245.	open source	විවෘත මූලාශ්‍ර	திறந்த மூலம்
246.	operational feasibility	මෙහෙයුම් ශක්‍යතාව	செயற்பாட்டுச் சாத்தியப்பாடு
247.	operator category	කාරක ප්‍රවර්ගය	செயலி வகை
248.	operator precedence	කාරක ප්‍රමුඛතා	செயலி முன்னுரிமை
249.	optical character reader (OCR)	ප්‍රකාශ අණු ලකුණු කියවනය	ஒளியியல் எழுத்துரு வாசிப்பான்

250.	optical mark reader (OMR)	ප්‍රකාශ ලකුණු කියවනය	காந்த மை எழுத்துரு வாசிப்பான்
251.	output	ප්‍රතිදානය	வெளியீடு
252.	packet switching	පොදි හුවමාරුව	பொதி மடைமாற்றல்
253.	paging	පිටුකරනය	பக்கமிடல்
254.	paradigm	සුසමාදර්ශය/ ප්‍රතිමානය/ප්‍රතිරූපය	கோட்பாட்டுச் சட்டகம்
255.	parallel implementation	සමාන්තර ස්ථාපනය	சமாந்தர அமுலாக்கம்
256.	parameter passing	පරාමිති යැවීම	பரமானக் கடத்தல்
257.	parity	සමතාව	சமநிலை
258.	password	මුර පදය	கடவுச்சொல்
259.	payment gateway	ගෙවුම් වාසල් ද්වාරය	பணக் கொடுப்பனவு நுழைவாயில்
260.	periodic refreshing	ආවර්ත ප්‍රබෝධකරණය	காலமுறை புதுப்பித்தல்
261.	peripheral device	පර්යන්ත උපාංගය / උපක්‍රමය	புறச் சாதனம்
262.	phablet	ෆැබ්ලට්	பெப்லட்
263.	phased implementation	අවධිස්ථාපනය / පියවර ක්‍රියාත්මකකිරීම	கட்ட அமுலாக்கல்
264.	phase modulation	කලා මුර්ඡනය	நிலை பண்பேற்றம்
265.	phishing	තතුබෑම	வழிப்பறித்தல்
266.	physical layer	භෞතික ස්ථරය	பௌதீக அடுக்கு
267.	physical memory	භෞතික මතකය	பௌதீக நினைவகம்
268.	pilot implementation	නියාමක ස්ථාපනය / නියාමක ක්‍රියාත්මක කිරීම	முன்னோடி அமுலாக்கல்
269.	piracy	චෞරත්වය/ ලුණ්ඨනය	களவு
270.	pirated software	චෞර/ලුණ්ඨිත මෘදුකාංග	திருட்டு மென்பொருள்
271.	plagiarism	ග්‍රන්ථ/රචනා චෞර්යය	கருத்துத் திருட்டு
272.	point to point connection	සාප්ප ලක්ෂ්‍ය සම්බන්ධතාව	ஒன்றுடனொன்று இணைப்பு

273.	pointing device	දැක්වුම් උපාංගය	சுட்டி சாதனம்
274.	port	කෙවෙනිය	வாயில், துறை
275.	portable external hard disk	ජංගම/සුවහනීය බාහිර දෘඪ තැටිය	காவத்தகு புற வன்தட்டு
276.	portal	ද්වාරය/ ආමුඛද්වාරය	வலைவாசல்
277.	Point of sale (POS) machine	විකුණුම් පොල යන්ත්‍ර	விற்பனை இட இயந்திரம்
278.	postulate	උපකල්පනය	எடுகோள்
279.	power supply	විදුලි සැපයුම/ජව සැපයුම	மின் வழங்கி
280.	presence check	තථ්‍යතා පරීක්ෂාව	இருத்தல் சரிபார்த்தல்
281.	presentation layer	සමර්පන/ඉදිරිපත් කිරීම් ස්ථරය	முன்வைப்பு அடுக்கு
282.	primary key	ප්‍රාථමික/මූල් යතුර	முதன்மைச் சாவி
283.	primitive data type	ප්‍රාථමික දත්ත වර්ගය	பூர்வீகத் தரவு வகை
284.	privacy	පෞද්ගලිකත්වය	அந்தரங்கம்
285.	private key	පෞද්ගලික යතුර	பிரத்தியேகச் சாவி
286.	process	ක්‍රියාවලිය/ක්‍රියායනය/ සැකසුම	செயல்/ முறைவழியாக்கல
287.	process control block(PCB)	ක්‍රියායන පාලන බණ්ඩිය	செயல் கட்டுப்பாட்டுத் தொகுதி
288.	process management	ක්‍රියායන කළමනාකරණය	செயல் முகாமைத்துவம்
289.	process states	ක්‍රියායන තත්ත්ව	செயல் நிலை
290.	process transition	ක්‍රියායන සංක්‍රමණය	செயல் நிலைமாறல்
291.	product commercialization	නිෂ්පාදන වාණිජ්‍යකරණය	தயாரிப்பு வர்த்தகமயமாக்கல்
292.	product of sum (POS)	ඓක්‍යයන්ගේ ගුණිතය	கூட்டுத்தொகையின் பெருக்கம்
293.	program translator	ක්‍රමලේඛ පරිවර්තක	செய்நிரல் மொழிபெயர்ப்பான்
294.	proprietary	හිමිකම් සහිත	தனியுரிமை
295.	protocol	නියමාවලිය	நடப்பொழுங்கு

296.	prototyping	මූලාකෘතිකරණය	மூலவகை மாதிரி
297.	proxy server	නියෝජන සේවාදායකය	பதிலாள் சேவையகம்
298.	pseudo code	ව්‍යාජ කේතය	போலிக்குறி
299.	public switch telephone network (PSTN)	පොදු ස්වීච දුරකථන ජාලය	பொது ஆளியிடப்பட்ட தொலைபேசி வலையமைப்பு
300.	public key	පොදු යතුර	பொதுச் சாவி
301.	pulse code modulation	ස්පන්ද කේත මූර්ජනය	துடிப்புக்குறி பண்பேற்றம்
302.	pulse width modulation	ස්පන්ද විතර මූර්ජනය	துடிப்பு அகலப் பண்பேற்றம்
303.	radio button	විකල්ප තේරීම	ரேடியோ பொத்தான்
304.	random access memory (RAM)	සසම්භාවී ප්‍රවේශ මතකය	தற்போக்கு அணுகல் நினைவகம்
305.	range check	පරාස පරීක්ෂාව	வீச்சு சரிபார்த்தல்
306.	rapid application development (RAD)	ශීඝ්‍ර යෙදවුම් සංවර්ධනය	துரித பிரயோக விருத்தி
307.	read only memory (ROM)	පඨන මාත්‍ර මතකය	வாசிப்பு மட்டும் நினைவகம்
308.	real time	තථ්‍ය කාලික	நிகழ்நேரம்
309.	record	උපලැකියාන	பதிவு
310.	redo	නැවත කිරීම	மீளச் செய்
311.	redundancy	සමතිරික්තතාව	மிகைமை
312.	reference model	යොමු ආකෘතිය	வலையமைப்பின் கட்டமைப்பு
313.	refreshing	පුබුදු කිරීම	புத்துயிர்ப்பித்தல்
314.	register memory	රෙජිස්තර මතකය	பதிவகம்
315.	relational	සම්බන්ධක	தொடர்பு, உறவுநிலை
316.	relational model	සම්බන්ධක ආකෘතිය	உறவுநிலை மாதிரி
317.	relational database	සම්බන්ධක දත්ත සමුදාය	உறவுநிலை தரவுத்தளம்
318.	relational instance	සම්බන්ධතා නිදර්ශනය	தொடர்பு முறை எடுத்துக்காட்டு

319.	relational schema	සම්බන්ධතා පරිපාටික සටහන	தொடர்பு முறைத் திட்டம்
320.	relationship	සම්බන්ධතාවය	தொடர்புமுறை
321.	remote	දුරස්ථ	தொலை, தூர
322.	render	විදැහු	வழங்கு
323.	repeater	පුනර්ඝටකය	மீளி, மீட்டி
324.	repetition	පුනරුක්තිය	மீள் செயல்
325.	reset button	පුත්සාරම්භ බොත්තම	மீளமைப்புப் பொத்தான்
326.	retrieve	සමුද්ධරණ	மீளப்பெறு
327.	return value	පුත්සාගමන අගය	திரும்பல் பெறுமானம்
328.	reverse auction	පුතිවෙන්දේසිය	எதிர்மாற்று ஏலம்
329.	ring topology	මුදු ස්ථලකය	வளைய இடத்தியல்
330.	router	මං හසුරුව	வழிப்படுத்தி, வழிச்செலுத்தி
331.	routing	මං හැසිරවීම	வழிச்செலுத்தல்
332.	scanner	සුපිරික්සකය	நுணுகு நோக்கி
333.	scheduler	නියමකරණය	ஒழுங்குபடுத்தி
334.	scope of variable	විචලx පරාසය	மாறி செயற்பரப்பு
335.	query	විමසුම	வினவல்
336.	selection	තේරීම	தெரிவு
337.	selector	වරකය	தேர்வி, தேர்ந்தெடுப்பி
338.	sensor	සංවේදකය	உணரி
339.	sequence	අනුකුමය	தொடர்
340.	sequential circuit	අනුකුමික පරිපථය	தொடர்ச் சுற்று
341.	sequential search	අනුකුමික සෙවුම	வரிசைமுறைத் தேடல்
342.	server	සේවාදායකය / අනුගුාහකය	சேவையகம்
343.	session layer	සැසි ස්ථරය	அமர்வு அடுக்கு
344.	sharable pool	හුවමාරු පුංජය	பகிரதகு பொது இடம்
345.	sign-magnitude	ලකුණුවත් පුමාණය / සංලක්ෂිත	குறியுடைய வீச்சளவு

		පරිමාණනය / අංකිත පරිමාණනය	
346.	single user-multi task	ඒක පරිශීලක-බහු කාර්යය	தனிப்பயனர்-பற்பணி
347.	single user-single task	ඒක පරිශීලක-ඒක කාර්යය	தனிப்பயனர்-தனிப்பணி
348.	smart card	සුහුරු කාඩ්පත	சூட்டிகை அட்டை
349.	smart phone	සුහුරු දුරකථනය	சூட்டிகைத் தொலைபேசி
350.	smart system	සුහුරු පද්ධතිය	சூட்டிகை முறைமை
351.	social networking	සමාජ ජාලකරණය	சமூக வலையமைப்பாக்கல்
352.	software	මෘදුකාංග	மென்பொருள்
353.	software agent	මෘදුකාංග කාරක	மென்பொருள் முகவர்
354.	sort	තේරීම	வரிசைப்படுத்து
355.	source	ප්‍රභව	மூலம்
356.	spiral model	සර්පිල ආකෘතිය	சுருளி மாதிரி
357.	spooling	චිතීම	சுற்றுதல்
358.	Star topology	තාරකා ස්ථලකය	வின்மீன் இடத்தியல்
359.	stepwise refinement	පියවරාකාර පිරිපහදුව	படிமுறை நீக்கல்
360.	storage	ආචයනය	சேமிப்பு
361.	storage allocation	ආචයන විභාජනය	சேமிப்பு ஒதுக்கல்
362.	stored program concept	ආචිත ක්‍රමලේඛ සංකල්පය	சேமிக்கப்பட்ட செய்நிரல் எண்ணக்கரு
363.	structure	වයුහය	கட்டமைப்பு
364.	structure chart	වයුහ සටහන	கட்டமைப்பு வரைபு
365.	structured	වයුහගත	கட்டமைப்புடைய
366.	structured query language(SQL)	වයුහගත විමසුම් බස	கட்டமைப்பு வினவல் மொழி
367.	submit button	යොමු බොත්තම	சமர்ப்பித்தல் பொத்தான்
368.	subnet mask	උප ජාල ආවරණය	உபவலை மறைமுகம்
369.	sub-netting	උප-ජාලනය	உபவலையமைப்பு

370.	sub-program	උප-ක්‍රමලේඛය	துணைச் செய்நிரல்
371.	sum of products (SOP)	ගුණිතයන්ගේ ඒකඎය	பெருக்கங்களின் கூட்டுத்தொகை
372.	supply chain management	සැපයුම් දාම කළමනාකරණය	விநியோக சங்கிலித்தொடர் முகாமைத்துவம்
373.	swapping	ප්‍රතිහරණය	இடமாற்றல்
374.	switch	ස්විචය	ஆளி
375.	syntax	කාරක රීති	தொடரியல்
376.	system development life cycle(SDLC)	පද්ධති සංවර්ධන ජීවන චක්‍රය	முறைமை விருத்தி வாழ்க்கை வட்டம்
377.	table	වගුව	அட்டவணை
378.	table check constraint	වගු පරීක්ෂා සංරෝධකය	அட்டவணை சரிபார்த்தல் கட்டுப்பாடு
379.	tag	උසුලනය	ஒட்டு
380.	Technical feasibility	තාක්ෂණික ශක්‍යතාව	தொழினுட்பச் சாத்தியக் கற்கை
381.	telecommuting	දුරස්ථ සංවාදය / දුර සන්නිවේදනය	தொலைசெயல்
382.	testing strategy	පරීක්ෂණ උපක්‍රමය	பரீட்சித்தல் உபாயம்
383.	text and font	පාඨ සහ අක්ෂර	வாசகமும் எழுத்துருவும்
384.	text formatting	පාඨ හැඩසවි ගැන්වීම	வாசக வடிவமைப்பு
385.	text input	පාඨ ආදාන	வாசக உள்ளீடு
386.	normal form	ප්‍රමත අවස්ථාව	இயல்பாக்கல் வடிவம்
387.	thumbnail	සැකෙවි රූ	குறும்படம்
388.	time division modulation (TDM)	කාල බෙදුම් මූර්ජනය	நேரப் பிரிவுப் பண்பாக்கம்
389.	time sharing	කාල විභජනය	நேரப்பகிர்வு
390.	timing	කාල ගණනය	நேரக்கணிப்பு
391.	top down design	මුදුන් බිම් සැලසුම	மேலிருந்து கீழான வடிவமைப்பு

392.	touch pad	ස්පර්ශක උපධානය / පාදකය	தொடு அட்டை
393.	touch screen	ස්පර්ශක තිරය	தொடுதிரை
394.	transaction processing system(TPS)	ගනුදෙනු සැකසුම් පද්ධතිය	பரிமாற்றச் செயலாக்க முறைமை
395.	transitive dependency	සංක්‍රාන්ති පරායත්තතාව	மாறும் சார்பு நிலை
396.	transport layer	ප්‍රවාහන ස්ථරය	போக்குவரத்து அடுக்கு
397.	transport protocol	ප්‍රවාහන නියමාවලිය	போக்குவரத்து நடப்பொழுங்கு
398.	tuple	උපලැකියාන/ පේළිය	பதிவு/நிரை
399.	twisted pair	ඇඹරි යුගල	முறுக்கிய சோடி
400.	two's compliment	දෙකෙහි අනුපූරකය	இரண்டின் நிரப்பி
401.	type check	ප්‍රරූප පරීක්ෂාව	வகை சரிபார்த்தல்
402.	constraint	සංරෝධනය	கட்டுப்பாடு வகை
403.	ubiquitous computing	සර්වවර්ති ආගණනය	எங்கும் வியாபித்த கணிமை
404.	undo	අහෝසි කිරීම	செயல்தவிர்
405.	unguided media	නියමු නොවන මාධ්‍ය	வழிபடுத்தப்படாத ஊடகம்
406.	uni-casting	සෘජු සම්ප්‍රේෂණය	தனிப்பரப்பல்
407.	unicode	යුනිකෝඩ්/ ඒකකේත	ஒற்றைக்குறி முறை
408.	unique constraint	අනන්‍ය සංරෝධකය	தனித்துவக் கட்டுப்பாடு
409.	unit testing	ඒකක පරීක්ෂණය	அலகுச் சோதனை
410.	universal	සාර්වත්‍ර	பொது
411.	updating	යාවත්කාලීන කිරීම	தற்காலப்படுத்தல்
412.	user	පරිශීලක	பயனர்
413.	user defined	පරිශීලක නිර්වාචිත	பயனர் வரையறை
414.	validation	වලංගු කිරීම	செல்லுபடியாக்கல்
415.	variable	විචල්‍යය	மாறி
416.	very large scale integration (VLSI)	ඉතා විශාල පරිමාණයේ අනුකලිත	மிகப் பெரியளவிலான ஒருங்கிணைப்பு

417.	video graphic adapter (VGA)	දෘශ්‍ය චිත්‍රක අනුහුරුකුරුව	காணொளி வரையி பொருத்தி
418.	virtual community	අතථ්‍ය ප්‍රජාව	மெய்நிகர் சமூகம்
419.	virtual memory	අතථ්‍ය මතකය	மெய்நிகர் நினைவகம்
420.	virtual storefront	අතථ්‍ය වෙළඳ ප්‍රදර්ශනාගාරය	மெய்நிகர் கடைமுகப்பு
421.	waterfall model	දියඇලි ආකෘතිය	நீர் வீழ்ச்சி மாதிரி
422.	wave length	තරංග ආයාමය	அலை நீளம்
423.	web portal	වෙබ් ද්වාරය	வலை வாசல்
424.	web server	වෙබ් සේවාදායකය	இணைய சேவையகம்
425.	web service provider	වෙබ් සේවා සැපයුම්කරු	இணைய சேவை வழங்குனர்
426.	white box testing	ස්වේත මංජුසා පරීක්ෂාව	வெண்பெட்டிச் சோதிப்பு
427.	world wide web (WWW)	ලෝක විසිරි වියමන	உலகளாவிய வலை
428.	uniform resource locator (URL)	ඒකාකාරී සම්පත් නිශ්චායකය	சீர்மை வள இருப்பிடங்காட்டி
429.	uniform resource identifier(URI)	ඒකාකාරී සම්පත් හඳුන්වනය	சீர்மை வள அடையாளங்காட்டி

This glossary is still being prepared.