

**COMPUTER CH1(EXERCISES) AND CH2(QUESTION/ANSWER+ EXERCISES)**

# 1 Computer Story











## Computing Devices Used by the Different Generations

Many households have two to three generations of people living under one roof: grandparents, parents and their children. The devices used by each generation when they were of your age have become increasingly advanced with the passing of time, as can be seen in the following pictures.

Ma'am were the computer in previous years the same as we see those today?






No, The computers have progressed a lot. They have become smaller in size and much faster in computing speed.

Below you can see the source of entertainment programmes for different generations.

Your Great Grandfather	Source of Entertainment	
	 Puppet show	
	 Black & White movies	
	 Colour Television	 Old Computer
	 Virtual reality games and computers & tabs	 Computer for doing calculations and m other things

## Generations of Computers

Similarly, there are different generations of computers. The computer that you see today is not the same as it used to be some years ago. It has passed through many generations to reach its current form. Let us learn about the different generations of computers that gradually paved the path for the invention of the modern computer.

The Generation	Parts used	Properties	Example
First Generation Computers (1940-1956)	 Vacuum Tube	<ul style="list-style-type: none"> <li>• First generation computers used vacuum tubes (very large in size)</li> <li>• These were slow and generated a lot of heat</li> </ul>	UNIVAC, ENIAC, IBM 701, IBM 650
Second Generation Computers (1956-1963)	 Transistors	<ul style="list-style-type: none"> <li>• Second generation computers used transistors, were smaller in size and faster.</li> <li>• These used magnetic tapes and punch cards to store data.</li> </ul>	IBM 7090, IBM 7094, UNIVAC 110B
Third Generation Computers (1964-1971)	 Integrated Circuits (ICs)	<ul style="list-style-type: none"> <li>• Third generation computers used Integrated Circuits (ICs).</li> <li>• These were smaller and faster and could do more complex work.</li> </ul>	IBM 370
Fourth Generation Computers (1971-Present)	 Microprocessor	<ul style="list-style-type: none"> <li>• Fourth generation computers use Microprocessors, are light weight and faster.</li> <li>• Currently we are using Fourth Generation computers.</li> </ul>	These are Personal Computers (PCs) like the IBM system and HP 3000
Fifth Generation Computers (Present and Beyond)	 Artificial Intelligence	<ul style="list-style-type: none"> <li>• These are still at the development stage.</li> <li>• These will take decisions based on the stored data.</li> </ul>	

**FAQ FILE**

Microprocessors were developed using the Very Large Scale Integration (VLSI) that combined thousands of transistor-based circuits into a single chip.

Log on to Linux - 6

## Classification of Computers

Computers can be classified on the basis of their size and speed.

### Microcomputers

Microcomputers are small computers whose CPU is a microprocessor, contained on a single integrated circuit chip. These computers are also called personal computers (PCs). Two main types of these are the Laptop and Desktop computers.



Desktop Computer



Modern desktop computers, video games, consoles, tablet PCs and many hand-held computers, including the latest high-end mobile phones, can be considered as examples of microcomputers.

### What is a Workstation?

A workstation is like a personal computer, but it has a more powerful microprocessor and, generally, a superior-quality monitor.

Workstations are used for engineering applications (CAD/CAM), desktop publishing and software development type of applications that require a moderate amount of computing power and high-quality graphics capabilities.

### Minicomputers

Minicomputers came into existence in the 1960s, when the mainframe computers were very expensive. Minicomputers were powerful and reasonably priced, so users switched over to these. The minicomputer then became less important, with the PC becoming so powerful on its own. The present-day PC is much more powerful and compact compared to the minicomputer.



Minicomputer

### Remember

Minicomputers are now normally referred to as mid-range servers. A minicomputer is a multi-processing system capable of supporting upto 250 users simultaneously.

### Mainframe Computers

Mainframes are huge computers that can occupy an entire room or even a whole floor. A mainframe can accommodate many users at a time. Terminals are used to connect a user to this computer. A terminal is a device that has a keyboard and a screen integrated into it. By using a terminal each user can provide inputs to the computer and get the output on his/her monitor.



Mainframe Computer

### Remember

Mainframes are normally referred to as enterprise servers.

### Supercomputers

As the name specifies, "supercomputers" are the most powerful computers. A supercomputer uses multiple CPUs to work on a problem, employing the concept of parallel processing.

Supercomputers are used for calculation-intensive tasks such as weather forecasting, climate research (like research on global warming), physical simulations (such as simulating the flying of aeroplanes), nuclear energy research and petroleum exploration. PARAM is India's first supercomputer.



Supercomputer



Parallel processing is the simultaneous use of more than one CPU to execute a program. Ideally, parallel processing should make a program run faster because there are more CPUs working on it.

### Latest Trends

The latest trend in computing is wearable computers. Common computer applications like e-mail, multimedia, calendar/scheduler are integrated into watches, cell phones, clothing, belts, backpacks, handbags, etc. that have a microprocessor chip embedded into them.



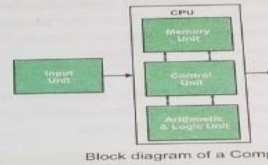
Wearable Computers

## What is Common in all Types of Computers?

All types of computers follow the same basic logical structure and perform the following five operations to convert data into useful information.

S.No.	Operation	Description
1.	Take Input	The process of entering data and instructions into the computer system.
2.	Store Data	Saving data and instructions so that they are available for processing as and when required.
3.	Processing Data	Performing arithmetic, logical operations on data in order to convert them into useful information.
4.	Output Information	The process of producing useful information or results for the user, such as a printed report or visual display.
5.	Control the workflow	Direct the manner and sequence in which all of the above operations are performed.

Now, I understand that a CU acts like a traffic constable and only directs data and information.



## Input Unit

The input unit contains devices using which we can enter data into a computer. It forms a link between the user and the computer. The input devices translate the information from humans into the form understandable by the computer. The following functions are performed by an input unit:

- It accepts the instruction and data from a user.
- It converts these instructions and data into computer acceptable form.
- It supplies the converted instructions and data to the computer system for further processing.



Keyboard



Joystick  
Input Device

## CPU (Central Processing Unit)

The CPU is considered to be the brain of the computer. The CPU performs all types of data processing operations. It stores data, the intermediate results and instructions (program). It controls the operation of all the computer parts. It controls all the internal and external devices performs arithmetic and logic operations. The operations that a microprocessor performs are called the instruction set of this processor. The CPU itself has the following components:

- **ALU (Arithmetic Logic Unit):** The ALU performs all the arithmetic operations (addition, subtraction, multiplication, and division) and logic operations. Logic operations test the various conditions encountered during processing and allow for different actions to be taken based on the results.
- **Control Unit:** The control unit maintains order within the computer system and directs the flow of traffic (operations) and data. The control unit works as follows: It selects one program statement at a time from the program storage area, interprets the statement, and sends the appropriate electronic impulses to the arithmetic-logic unit and storage section to cause the to carry out the instruction.

### Memory

Memory is the part of the computer that holds data and instructions for processing. Although closely associated with the central processing unit, memory is separate from it. Technically memory is not a part of the CPU.

### Remember

The control unit does not perform the actual processing operations on the data. Specifically, the control unit manages the operations of the CPU, be it a single-chip microprocessor or a full-size mainframe.

## Output Unit

The output unit consists of devices that help us get the information from the computer. This unit link between the computer and user. Output devices translate the computer's output into the form that can be understood by users.



Monitor



Printer

Output Devices

The following functions are performed by an output unit:

- It accepts the result produced by the computer that is in coded form. So, it cannot be understood by us.
- It converts these code results into a form that can be read by us.
- It supplies the converted result to the user.



The math whiz Ms. Shakuntla Devi's name was entered in the Guinness Book of Records in 1980 when she multiplied two 13-digit numbers (7,686,369,774,870 by 2,4265,099,745,779) accurately in 28 seconds. In 1977 she beat a computer—the UNIVAC—by 10 seconds. This was when she calculated the 23rd root of a 201-digit number in 50 seconds.



- First generation computers used vacuum tubes.
- Second generation computers used transistors.
- Third generation computers used Integrated Circuits (ICs).
- Fourth generation computers use Very large Scale Integrated (VLSI) Circuits, also called microprocessors.
- Fifth generation computers are being developed to use the concept of artificial intelligence.
- Microcomputers are small computers whose CPU is a microprocessor, contained on a single integrated circuit chip.
- A supercomputer uses multiple CPUs to work on a problem, using the concept of Parallel processing.
- Parallel processing is the simultaneous use of more than one CPU to execute a program.
- All types of computers follow a similar basic logical structure and perform the same basic operations for converting data into useful information.

## EXERCISE

Multiple Choice Questions. Tick (✓) the correct answer.

1. First generation computers used:  
a. Transistors  b. ICs  
c. Vacuum tubes  d. Artificial intelligence
2. Fourth generation computers used:  
a. Transistors  b. ICs  
c. Vacuum tubes  d. Artificial intelligence
3. A device that has a screen and a keyboard integrated in it is called:  
a. Mainframe  b. Micro computer  
c. Super computer  d. Terminal
4. Super computers employ the technique of:  
a. Multiple processing  b. Parallel processing  
c. Serial processing  d. None of these
5. Instructions and data from a user is accepted by:  
a. Output unit  b. Processing unit  
c. Input unit  d. None of these
6. Result is delivered by:  
a. Output unit  b. Processing unit  
c. Input unit  d. None of these
7. These are two components of CPU  
a. AU and CLU  b. ALU and CU  
c. ULA and CU  d. AU and CU

8. The part of CPU which does the actual calculations is called:

a. AU and CLU  b. ALU and CU   
 c. ULA and CU  d. AU and CU

**Write (T) for True and (F) for False statements.**

1. First generation computers came into existence after 1980.
2. Fifth generation computers will use artificial intelligence.
3. Microcomputers use microprocessors.
4. Minicomputers are now normally referred to as mid-range servers.
5. Supercomputers are used for calculation-intensive tasks such as weather forecasting, climate research, etc.
6. In parallel processing a single processor works on multiple problems.
7. The CU does all the logical operations in a CPU.
8. The Input Unit accepts instructions and data from the User.





**Select the suitable word to fill in the blanks.**

Transistors	Output unit	Fourth	Super Computer	Parallel
Blaise Pascal	First	Param	ICs	CU

1. \_\_\_\_\_ generation computers used vacuum tubes.
2. \_\_\_\_\_ generation computers use microprocessors.
3. Second generation computers used \_\_\_\_\_.
4. Third generation computers used \_\_\_\_\_.
5. \_\_\_\_\_ is an example of first generation computers.
6. \_\_\_\_\_ processing is the simultaneous use of more than one CPU to execute a program.
7. \_\_\_\_\_ is India's first Supercomputer.
8. \_\_\_\_\_ is used for calculation-intensive tasks.
9. The \_\_\_\_\_ in the CPU directs data and information within the computer.
10. The \_\_\_\_\_ supplies the converted results to user.

Computer Sto

Draw lines to match the computer generation with the parts used. Also write the name of the part in the space provided.

First generation computers		_____
Second generation computers		_____
Third generation computers		_____
Fourth generation computers		_____

**Think and Tell (Oral Questions)**

1. How parallel processing in super computers result in fast processing?
2. Can we compare the working of the CU as a traffic constable? If yes, why?
3. How will 5<sup>th</sup> generation computers work? Think of an example

**Write down about basic operations of a computer to convert data into useful information.**

1		_____
2		_____
3		_____
4		_____
5		_____

Computer Story



## Assembly Language

The assembly language is close to the machine language, but in the assembly language, binary operation codes were replaced by Mnemonics.

Mnemonics are like two or three-letter abbreviations. For example, in the machine language, if the operation code for 'add' is '0010', its equivalent in the assembly language is 'ADD'. Since mnemonics are abbreviations or symbols, they need to be translated into the machine language to get executed. This job is done by an Assembler.

```
Example of IBM PC assembly language
; Accept a number in register AX
; subtract 32 if it is in the range 97-120
; otherwise leave it unchanged.
BITS 32
PROC main
    CMP     AX, 97      ; compare AX to 97
    JL     NONE        ; if lower, jump to NONE
    CMP     AX, 120     ; compare AX to 120
    JC     NONE        ; if greater, jump to NONE
    SUB     AX, 32      ; subtract 32 from AX
    RET             ; return to main program
NONE:
    RET             ; procedure ends here
ENDP

```

FIGURE 17. Assembly language  
An Assembly language program

### Remember

Machine and assembly languages are also called low-level languages as they are linked with the hardware.

## High-Level Languages

As the speed, power and the capacity of the computer increased, a need was felt to develop programs that could make use of computers in diverse fields and could be developed by people who were not experts in computer architecture and hardware. So High-Level Languages came into existence. These high-level languages were much closer to the human language.

```
File Edit View
CLS
LET A = 5
LET B = 10
LET C = A + B
PRINT C
END

```

A High-Level Language program

High-Level Languages (HLL) are programming languages designed for users to write instructions in familiar English-like syntax (like  $SUM=A+B$ ) rather than in the machine language or by using mnemonics.

Fortran, C and Java are a few examples of high-level languages. You need language translators (compilers or interpreters) to change the HLL code to the machine code so that it could be understood and executed by the computer.

### Remember

High-level languages are considered to be third-generation languages.

## Computer Software

A computer is a dumb machine, which is completely dependent on the user to give it step-by-step instructions to make it work. These instructions need to be given to it in the form of a computer program.

Computer software is the intelligence of the computer.



A set of computer programs that make the computer work is called software.

### Types of Softwares

Software can be classified into the following categories, depending upon the usage to which it is put.

1. System software
2. Application software
3. Utilities

### System Software

The system software works at the internal level of the computer and instructs the computer how to manage its resources (hardware and software).

An operating system (like Windows 7, Linux and Unix) which is responsible for providing an interface between the user and the computer is also a type of system software.

### Remember

Operating systems, Assemblers, Compilers or Interpreters are types of system software.

### Application Software

The application software makes the computer more useful, making it possible for people to use it for different purposes.

Application software helps the user to work more efficiently, faster and more meaningfully.

Application software can be further classified as follows:

1. Custom-made application software
2. General-purpose application software

### Custom-Made Application Software

Custom-made application software are the programs developed as per individual needs.

A few examples of such software are: accounting, library management, fee collection, hotel management, etc. These software are developed using a suitable computer language or package.

### General-Purpose Application Software (packages)

General-purpose application software provide the environment required to develop custom-made software.

For example, by using the LibreOffice Base software, library management systems for schools can be developed.

### Utilities

Utility programs perform the routine but necessary jobs in a computer system.

These programs make life easier for a user by doing several routine and important jobs quickly and with ease. These jobs include:

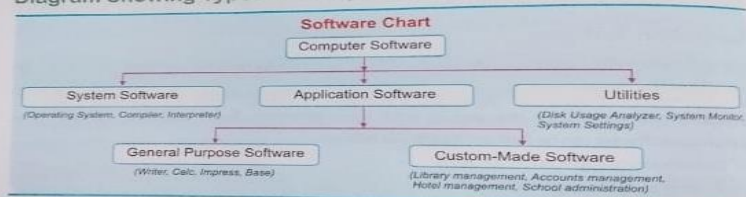
- Backup of data
- Testing the disk integrity
- Recovering the accidentally deleted data.

The Disk Usage Analyzer and System monitor are the common utilities provided with Edubuntu for the efficient working of the hard disk and your system.

To find Utilities in Edubuntu, use Applications → System Tools option.



### Diagram Showing Types of Computer Software



### Recap

- The Machine language is the elementary language of a computer; it consists of binary digits (0 and 1) only.
- In the Assembly language, binary operation codes were replaced by Mnemonics.
- High-Level Languages (HLL) are programming languages designed for users to write instructions in English-like statements.
- The System software works at the internal level of the computer and tells the computer how to manage its resources.
- An operating system, which is responsible for providing an interface between the user and the computer, is a type of System software.
- The Application software makes the computer more useful, allowing people to use it for diverse purposes.

### EXERCISE

Multiple Choice Questions. Tick (✓) the correct answer.

- This language consists of 0 and 1s.
  - Machine language
  - Assembly language
  - High level language
  - None of these
- This language consists of mnemonics.
  - Machine language
  - Assembly language
  - High level language
  - None of these
- This language consists of English like sentences.
  - Machine language
  - Assembly language
  - High level language
  - None of these



4. An operating system is a type of:
  - a. System software
  - b. Application software
  - c. Custom made application software
  - d. None of these
5. Library management software is an example of:
  - a. System software
  - b. Application software
  - c. Custom made application software
  - d. None of these
6. Writer software is an example of:
  - a. System software
  - b. Application software
  - c. Custom made application software
  - d. None of these

**Write (T) for True and (F) for False statements.**

1. The Machine language is the elementary language of a computer.
2. 1 and 2 are also called binary digits.
3. Learning the high-level language is more difficult than learning the machine language.
4. A Compiler or Interpreter changes the high-level language into the machine language.
5. Windows 7 and Ubuntu are examples of an application software.
6. A library management software is an example of a System software.
7. The Disk Usage Analyzer is a utility program.

**Select the suitable word to fill in the blanks.**

1s	High Level	0s	Compiler	General Purpose
Interpreter		Operating System		Custom made

1. The Machine languages consist of \_\_\_\_\_ and \_\_\_\_\_.
2. In \_\_\_\_\_ languages, you can write instructions in English-like statements.

3. A \_\_\_\_\_ or a \_\_\_\_\_ converts a High-Level Language program into the Machine language.
4. An \_\_\_\_\_ is an example of a System software.
5. LibreOffice Base is an example of \_\_\_\_\_ application software.
6. A result-making software is an example of \_\_\_\_\_ application software.

**Answer the following in 2-3 lines.**

1. Write about the Machine language.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. Write about High-Level languages.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
3. How are High-Level languages understood by a computer?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
4. What is a System software?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. What are the different types of Application software? Give one example of each.

Write down the terms from the box in the correct column.

Windows	Library Management Software	Java
System Monitor	LibreOffice Writer	Unix
Linux	Disk Usage Analyzer	C++

System Software	General Purpose Application Software	Custom Made Application Software	High-Level Languages	Utilities

**ACTIVITY**

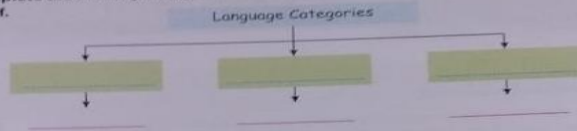
1. In your computer lab find out which General Purpose Application software you are using. Also try to find out which type of application software you can develop there.
2. Name the System Software that you have in your computer.
3. Name the Utilities that you have on your computer. Also mention the purpose of each utility.

**Think and Tell (Oral Questions)**

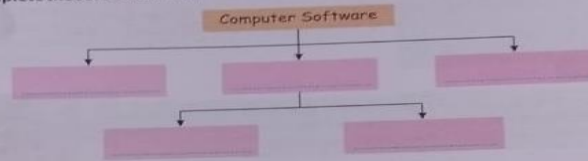
1. Why is the Machine language the fastest to execute?
2. Sushil has to make a project report. Which general purpose software should he use?
3. Hari wants to analyze the disk. Which utility software should he use?

**Worksheet**

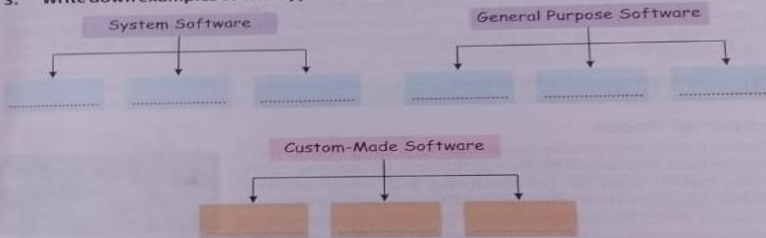
1. Complete the chart by filling different categories of languages and what they are made up of.



2. Complete the software chart.



3. Write down examples of each type of software to complete the chart.



**Answer the following questions:**

**Q1. Write about machine language.**

**Ans.** A machine language is the elementary language of a computer, which consists of binary bits (0 and 1) only. This language can be directly accepted by the computer.

**Q2. Write about high-level languages.**

**Ans.** High-level languages are programming languages designed for the users to write instructions in familiar English like syntax( $sum=a+b$ ) rather than using binary language or mnemonics. Eg- c language, Java language

**Q3. How are High-level languages understood by the computer?**

**Ans.** You need language translators like compiler or interpreter to convert HLL(High-Level language) code to machine language so that it can be understood and executed by a computer.

**Q4. What is a system software?**

**Ans.** The system software works at the Internal level of a computer and instructs the computer how to manage its resources (Hardware and software).

**Q5. What are the different types of Application Software? Give one example of each.**

**Ans.** The two types of application software are-

- 1. Custom - made application software-** These softwares are developed according to the individual need.
- 2. General - purpose application software-** General -purpose application software provides an environment for developing custom made application software.

\*\*\*\*\*

**NOTE:-**

**\*Students you will write these answers in any copy available at home and later on stick those pages in your computer copies. For computer you will make registers.**

**\*Solve the exercises and worksheets of both the Chapters in rough copies later on in books.**

**\* Diagrams from Ch1 – Transistors, Integrated circuits, microprocessor and monitor.. (Ch2 has no diagrams).**