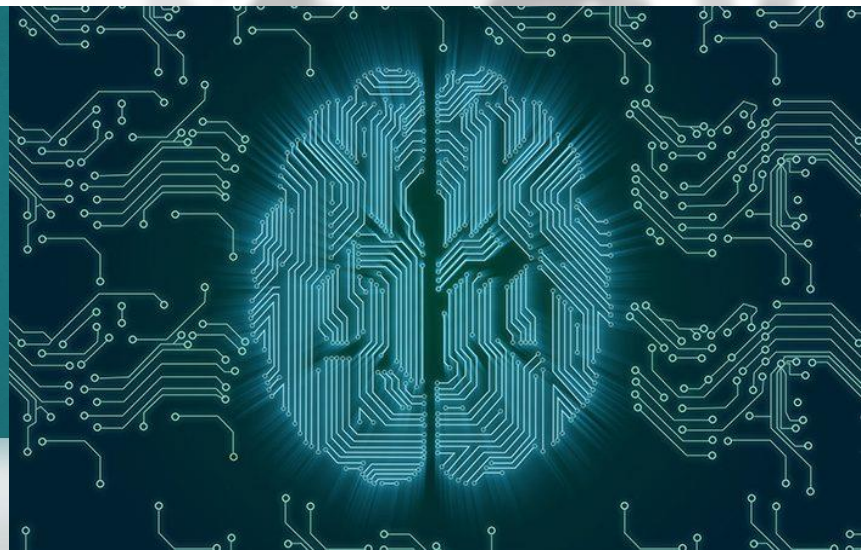
COMPUTER KNOWLEDGE

Special compilation for EPFO Exam



Course By – Dikshant Sharma

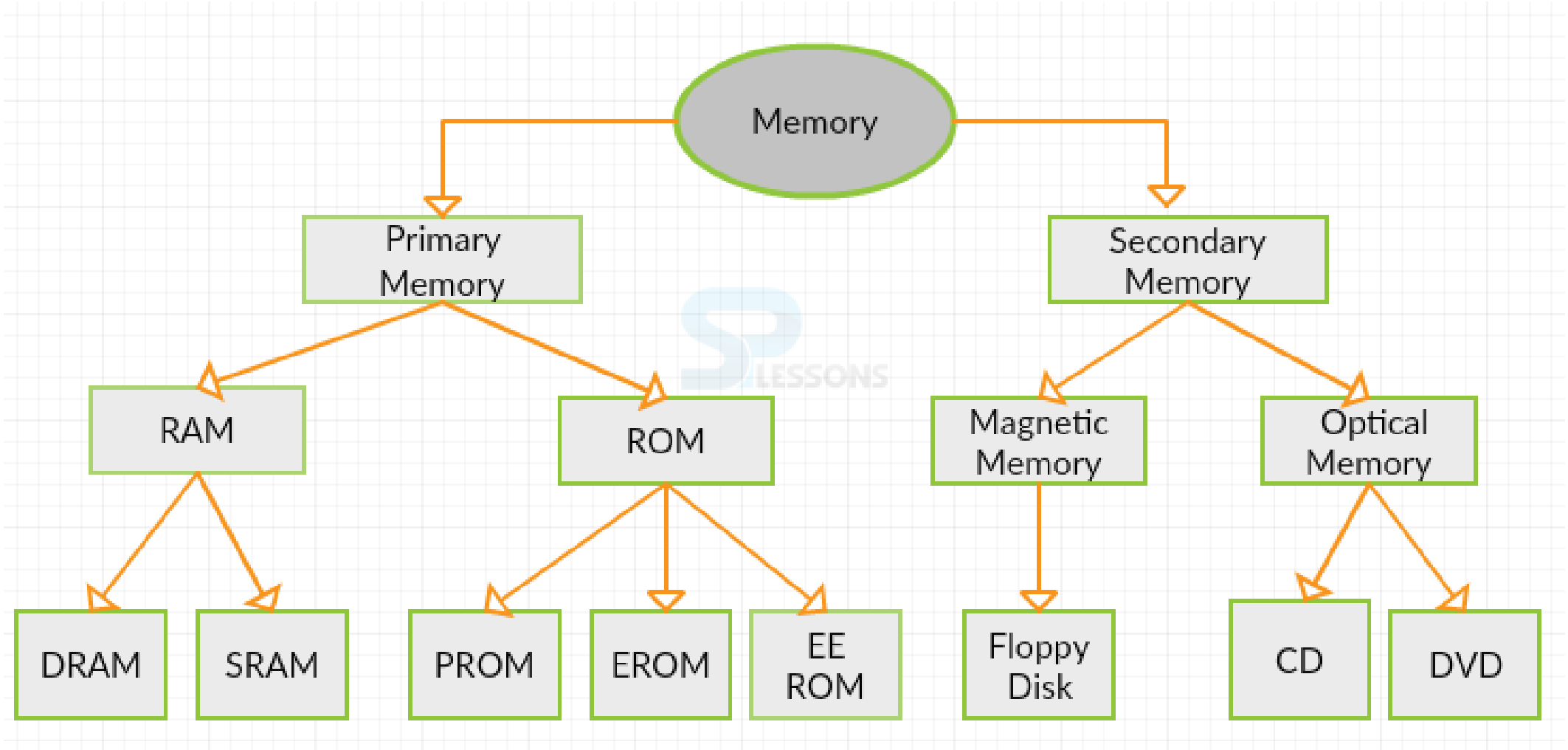
LECTURE 2 - Scope

Components

I. **Hardware**
   i. **Memory/Storage**

II. **Software**
   i. **Computer Languages**
      i. Machine Language
      ii. Assembly Language
      iii. High Level Language
   ii. **Software - Definition & Types**
   iii. **System Software (Operating Systems, Utility Software Etc.)**
   iv. **Application Software (General Purpose, Specific Purpose)**

Memory/Storage



Memory/Storage

1. CACHE Memory

- Nearest to the CPU
- Memory is too low – Very expensive
- It is volatile and used to compliment RAM

2. PRIMARY Memory

Important Characteristics of Primary Memory

1. Usually volatile memory
2. Data is lost in case power is switched off
3. It is the working memory of the computer
4. Faster than secondary memories
5. A computer cannot run without primary memory

Memory/Storage

2 Types of Primary Memory:

RAM (Random Access Memory)

- Not Permanent Memory
- Volatile Memory
- Need to save work on secondary storage

- **Types:**

1) **Static RAM**
   a. On Chip Memory – Whose access time is small – They are faster (Uses Transistor)
   b. Does not need periodic refreshment to maintain data
2) **Dynamic RAM**
   a. Off Chip Memory – it has high access time and hence it is a bit slower (Uses Capacitor)
   b. Most commonly used
   c. Needs periodic refreshment

ROM (Read only Memory)

- For bootstrapping of computer
- Set of instructions to start the computer
- Permanently inbuilt in computers

Types:

1) **PROM (Programmable Read Only Memory)**
   a. Supplied empty by supplier
   b. Can be filled by user but cannot be erased
2) **EPROM (Erasable PROM)**
   a. Allows user to delete data and re-write
   b. Data can be deleted using UV rays (Most common)
3) **EEPROM (Electrically Erasable PROM)**
   a. Allows user to erase data by simply applying a voltage chip
   b. Saves a lot of time – Most Expensive

Memory/Storage

SECONDARY MEMORY

- Magnetic and optical memories
- Known as backup memory
- Non Volatile Memory
- Data is permanently stored even if the power is switched off

- **SEQUENTIAL ACCESS**

Example

- Magnetic Tapes such as cassettes

- **DIRECT ACCESS**

Example

- Magnetic Disk (700 to 3600 RPM)
- Floppy Disk
- Hard Disk
- CD – ROM
- Re-Writable CD
- BD Blue Ray Disc
- Pen-drives
- Memory Cards

Memory/Storage

Memory Units

Bit is the smallest memory unit

KB → Kilobyte
MB → Megabyte
GB → Gigabyte
TB → Terabyte
PB → Petabyte
EB → Exabyte
ZB → Zettabyte
YB → Yottabyte
BB → Brontobyte
GB → Geopbyte

SYMBOL	FULL FORM
1 BIT	BINARY DEGIT
4 BITS	NIBBLE
8 BITS	BYTE
1024 BYTE	KILOBYTE
1024 KILOBYTE	MEGABYTE
1024 MEGABYTE	GIGABYTE
1024 GIGABYTE	TERABYTE
1024 TERABYTE	PETABYTE
1024 PETABYTE	HEXABYTE
1024 HEXABYTE	ZEETABYTE

Important Question –

Hard Drive VS Solid State Drive?

Which one is better & why?

LECTURE 2 - Scope

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I. Hardware

i. **Memory/Storage** ✔

II. Software

i. **Computer Languages**
   i. Machine
   ii. Assembly
   iii. High Level

ii. **Software - Definition & Types**

iii. **System Software (Operating Systems, Utility Software Etc.)**

iv. **Application Software (General Purpose, Specific Purpose)**

Computer Languages

The languages in which programs are written are called programming languages or Computer Languages

1. **Machine Language** – (Binary or hexadecimal language)
   a) A computer programming language consisting of binary or hexadecimal instructions which a computer can respond to directly
2. **Assembly Languages** – (Low Level Language)
   a) In the 1950s, to reduce programming complexity and provide some standardization, assembly languages were developed.
   b) Assembly languages, also known as symbolic languages use abbreviations or memonic code - codes more easily memorized to replace the 0s and 1s of machine languages

ADVANTAGES –

i. More standardized and easier to use than machine languages
ii. They operate very efficiently, although not as efficient as the machine languages

Computer Languages

3. High Level Language –

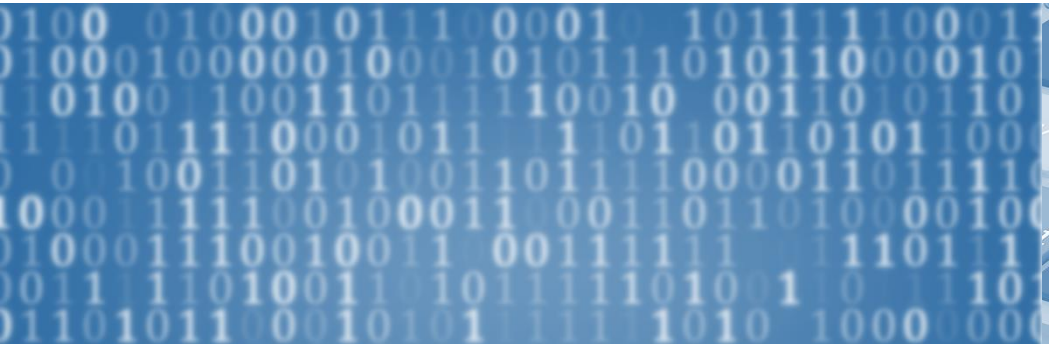
High Level Languages helped programmers by reducing further the number of computer operations details they had to specify, so that they could concentrate more on the logic needed to solve the problem

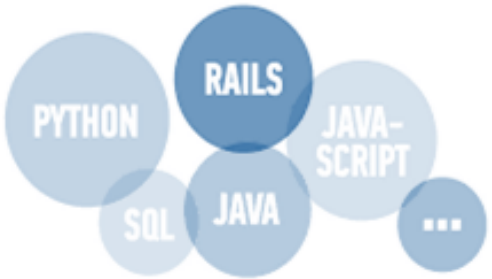
Examples – C, C++, JAVA, COBOL, FORTRAN, SQL etc.

a) **COBOL** – For business applications

b) **FORTRAN** – In engineering and scientific applications

c) **C, C++, JAVA** – For general purposes





Computer Languages

Convert text to binary

Input data

DIKSHANT

Convert

text to bin numbers

Output:

01000100 01001001 01001011 01010011 01001000 01000001 01001110
01010100

Levels of Programming Languages

High-level program

```
class Triangle {
  ...
  float surface()
    return b*h/2;
  }
```

Low-level program

```
LOAD r1,b
LOAD r2,h
MUL r1,r2
DIV r1,#2
RET
```

Executable Machine code

```
0001001001000101
0010010011101100
10101101001...
```

Computer Languages

LANGUAGE TRANSLATORS –

- Computers work only on machine language (Binary) – Hence all instructions to be executed by computers must be in machine language.
- Translators perform the task of translation of high level languages or assemble languages into machine language
- They also identify errors that may be present in the program

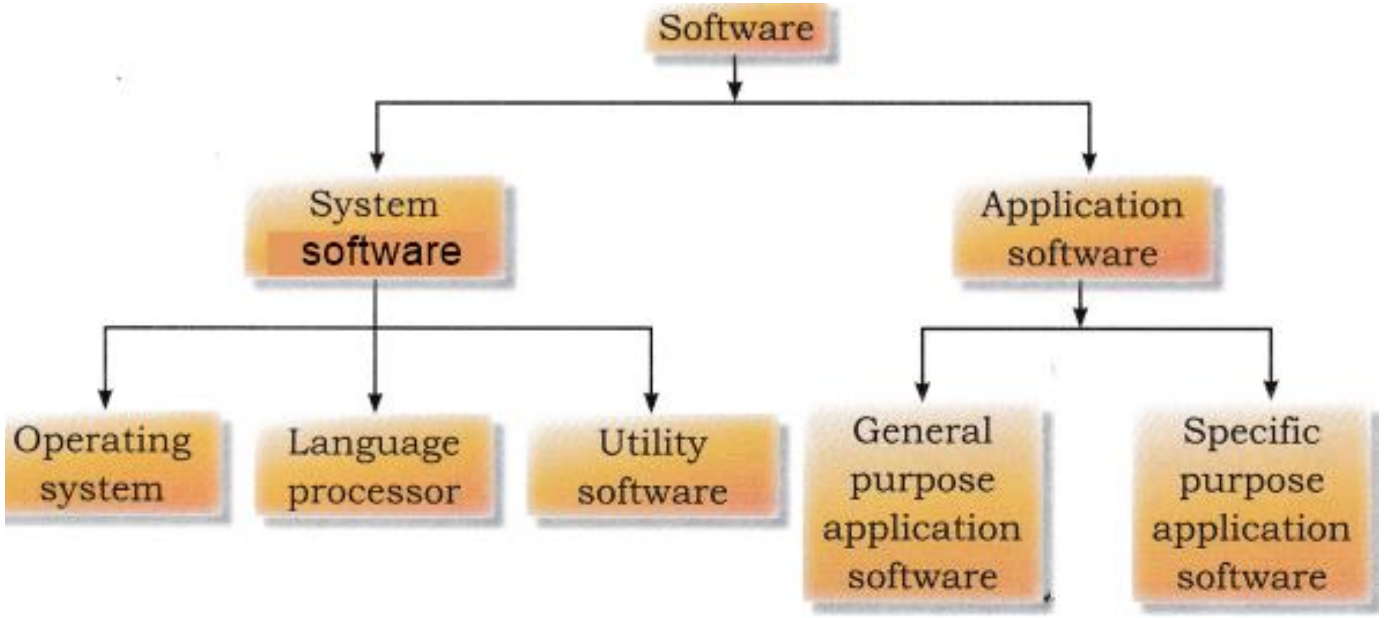
1. **ASSEMBLER –** Used for translation of assembly language to machine language

2. **COMPILER –** For translation of high level language to machine language (All at once)

3. **INTERPRETER –** For translation of high level language to machine language (LINE BY LINE)

What is a SOFTWARE?

- Computer software or just software, Is a **collection of computer programs and related data that provides the instructions for telling a computer what to do and how to do it**.
- It is any set of machine readable instruction that directs a computer to perform specific operation
- Any set of instructions that guides the hardware and tells it how to accomplish each task.



System Software

DEFINITION →

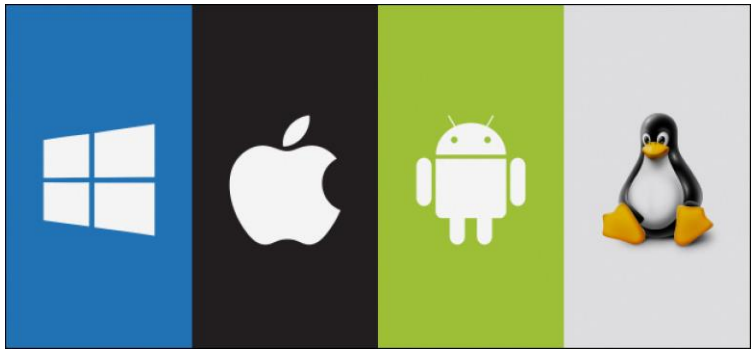
System software is computer software designed to operate the computer hardware to provide basic functionality and to provide a platform for running application software.

Primary Objectives of a system software -

1. Enhance the efficiency of hardware utilization
2. Make computers simple to use

Examples of system software –

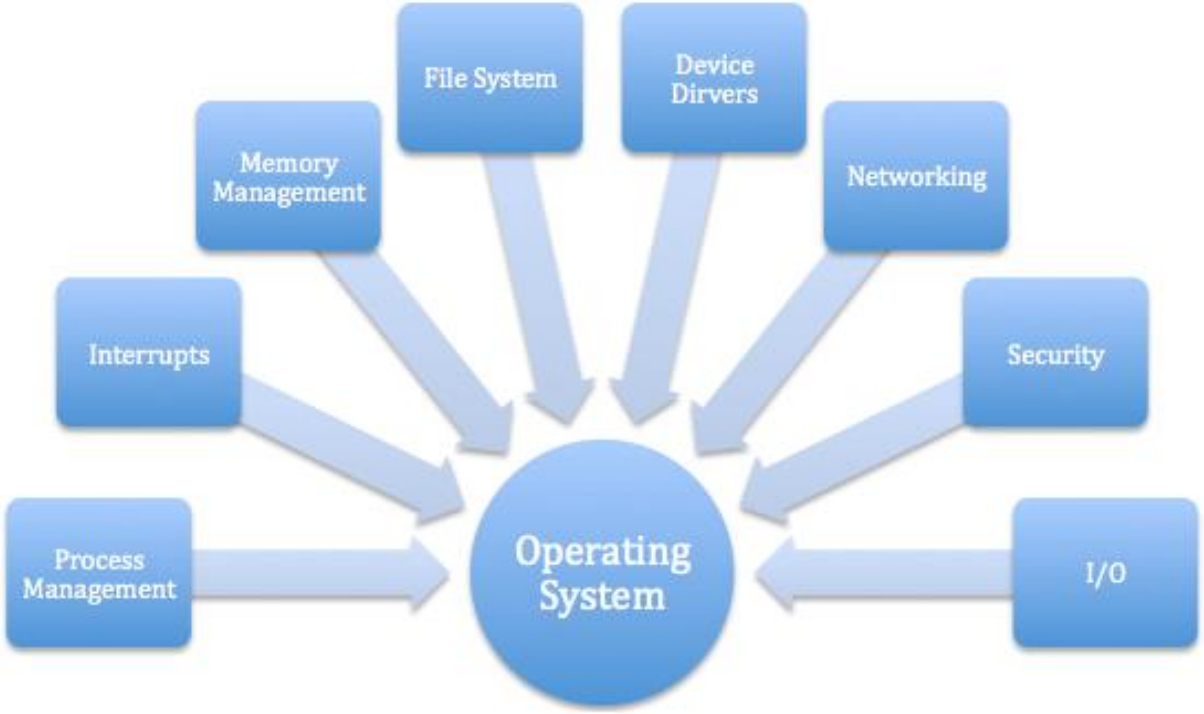
Operating System, Language processors, Utility software



System Software

OPERATING SYSTEM

- An operating system is the most important system software and is a must to operate a computer system
- It takes care of scheduling multiple jobs for execution and manages the flow of data and instructions between the input/output units and the main memory



GRAPHIC USER INTERFACE **COMMAND LINE INTERFACE**

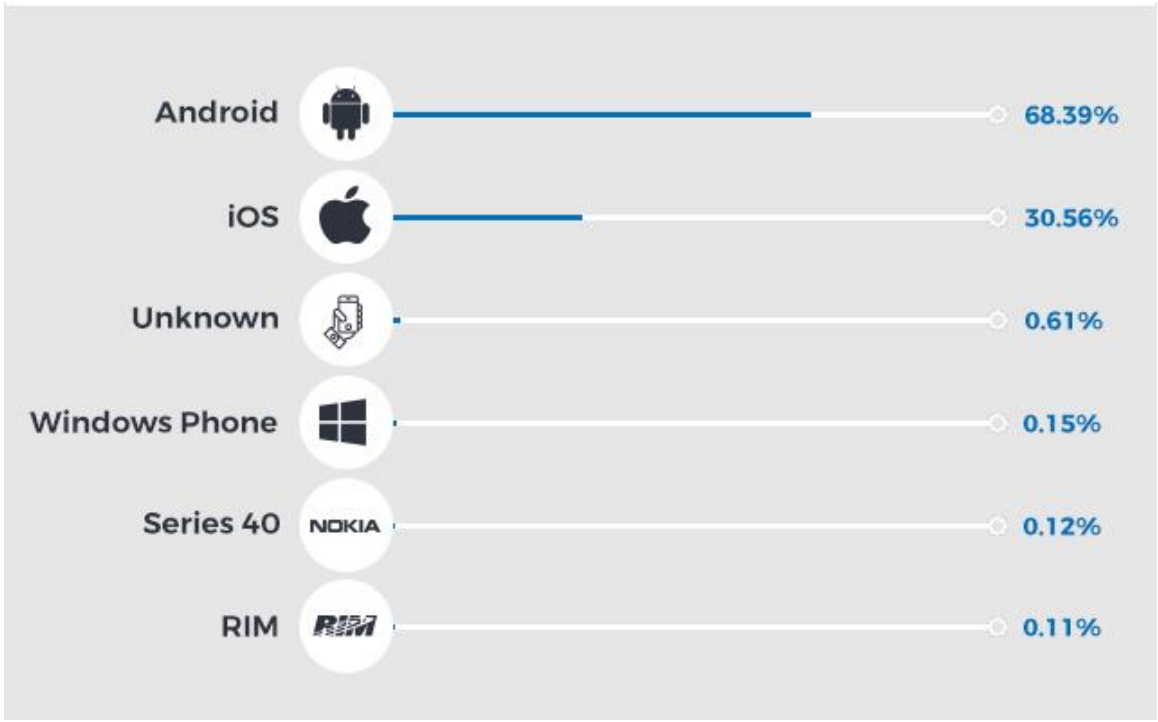
System Software

Success Tree

Some important and widely used operating systems

For Desktops / Laptops

For Mobile Phones



System Software

UTILITY SOFTWARE

- Utility software may be considered as a system software which is used quite often in the development of a program
- Major usage is for maintenance work of the computer
- Such programs are normally provided by the manufacturers

Application Software

- These are also known as end user programs – they do real work for users
- Usually to perform a specific task

GENERAL PURPOSE

SPECIFIC PURPOSE

- Used to perform specific tasks
- Designed and developed for the needs and requirement of a particular customer
- It may not be useful for any other company or user
- Example –
  - Accounting
  - Contact Management
  - Used in a particular industry such as stock trading or library management

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iv. **Application Software (General Purpose, Specific Purpose)** ✔

PREVIOUS YEAR QUESTIONS

Success Tree

1. Pick the odd one out?

A. CD/DVD

B. Floppy Disks

C. SD Disk

D. BIOS

2. Which operations are performed by RAM ?

A. Read

B. Write

C. Read & Write

D. Depends on the Computer

3. Which among following is secondary storage device?

A. Hard Disk

B. RAM

C. Diode

D. Semi Conductor

PREVIOUS YEAR QUESTIONS

4. Storage which stores or retains data after power off is called?

A. Volatile Storage

B. Non-Volatile Storage

C. Sequential Storage

D. Direct Access Storage

5. A permanent memory, which halls data and instruction for start-up the computer and does not erase data after power off?

A. Network Interface Card

B. CPU

C. RAM

D. ROM

6. Magnetic tape is not practical for applications where data must be quickly recalled because tape is

A. A Random Access Medium

B. A Sequential Access Medium

C. A Read Only Medium

D. An Expensive Storage Medium

PREVIOUS YEAR QUESTIONS

7. What is the difference between mnemonic codes and machine codes?

A. There is no difference

B. Machine codes are in binary, mnemonic codes are in shorthand English.

C. Machine codes are in shorthand English, mnemonic codes are in binary.

D. Machine codes are in shorthand English, mnemonic codes are a high-level language

8. Which language was specifically used for engineering and scientific applications?

A. JAVA

B. C++

C. COBOL

D. FORTRAN

9. Which user interface is a form of user interface that allows users to interact with electronic devices through graphical icons and visual indicators?

A. Command line interface

B. Graphic User Interface

C. Both A & B

D. None of these