Bridge Course Class 11 I.P & C.S.

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Day 6	Operating System	1. Introduction of O.S. 2. Functions of Operating System 3. Types of Operating System 4. Language Translators: Assembler, Compiler & Interpreter
Day 7	Programming Tools:	1. Need of Programme 2. Writing of Algorithm
Day 8	Flow Chart	1. Importance of flow chart 2. Different Symbols used in flow chart and their meaning
Day 9	Construction of flow Chart	1. How to draw flow chart
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Day 11	Introduction of Python	1. Python a Programming language 2. Features of python 3. Advantages of python 4. Python Character Set & tokens 5. Keywords & Identifiers 6. Literals
Day 12	Operators	1. Operators and its types 2. Arithmetic Operators 3. Relational Operators are used to compare the values

Day 13	Operators	4. Assignment Operators 5. Logical Operators 6. Membership Operators 7. Identity Operators
Day 14	Data Types	1. Identification of different data types in python 2. Writing of Simple program in python
Day 15	Program in python	1. Students will learn how to write program in Python

DAY 1

Uses of Computer in day to day life:

- In Home: People use the computer at home for distance learning, e-commerce, music, movies, and much more. ...
- In Hospitals: ...
- In Education: ...
- In Business: ...
- In Banking: ...

What is Computer?

A computer is **an electronic device that manipulates information, or data**. It has the ability to store, retrieve, and process data.

What are advantages of Computer?

- High Speed. One of the reasons for improvement in the quality of life is personal computer's speed. .
- Accuracy. Human make errors. ...
- Automation. A lot of tasks can be automated saving a lot of time.

Strength of using a computer:

The strengths of using a computer system are

- speed, accuracy, high storage capacity, versatility, and reliability.

What is weakness of computer?

The weaknesses of a computer system include

- **zero IQ and lack of decision making power or dependency, and no feelings**.

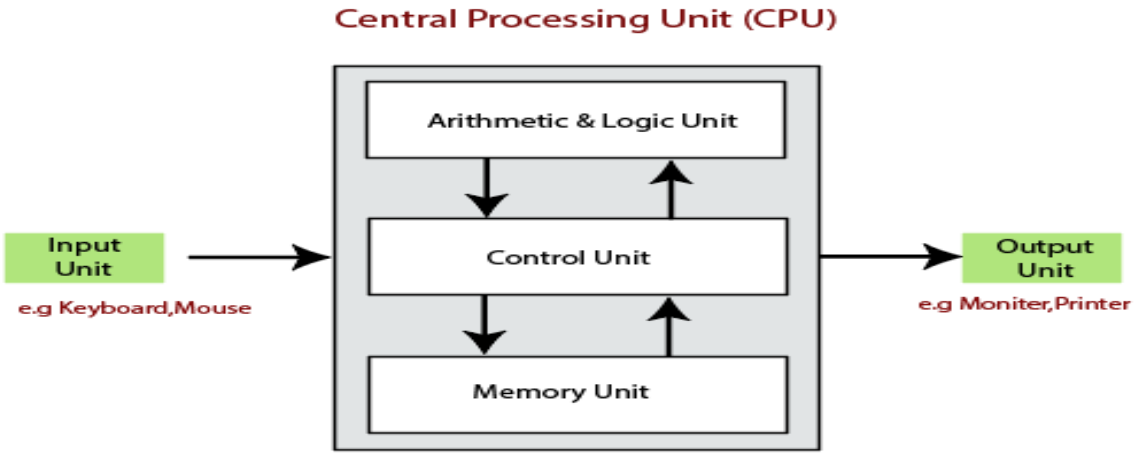
Computer system has four physical components viz. (i) CPU, (ii) Primary Memory, (iii) Input Device and (iv) Output Devices. They are referred to as hardware of computer.

<u>Introduction to Computer System :-</u>

Definition: A computer is an electronic device that can be programmed to accept input, process it and generate result.

A computer along with hardware and software together is called a computer system.

Block diagram of a computer system



A computer system primarily comprises a central processing unit (CPU), memory, input/output devices and storage devices.

DAY 2

Input Unit

Devices that takes an input and convert it into binary language that the computer understands.
E.g : keyboard, mouse, joystick, scanner etc.

Central Processing Unit (CPU)

- It carries out the actual processing and usually referred as the brain/heart of the computer.
- It is commonly called microprocessor also. Physically, a CPU can be placed on one or more microchips called integrated circuits (IC).

CPU has two main components —

- Arithmetic Logic Unit (ALU) and Control Unit (CU).
- ALU performs all the arithmetic and logic, Operations that need to be done as per the instruction in a program.
- CU controls sequential instruction execution interprets instructions and guides data flow through the computer's memory, ALU and input or output devices.
-

Arithmetic and Logic Unit (ALU)

- The ALU, performs mathematical calculations and takes logical decisions.
- Arithmetic calculations include addition, subtraction, multiplication and division.
- Logical decisions involve comparison of two data items to see which one is larger or smaller or equal (Relational Operators used : <,><=,>=,!=)

Control Unit:

- The Control unit coordinates and controls the data flow in and out of CPU and also controls all the operations of ALU, memory registers and also input/output units.

Memory:

- Memory attached to the CPU is used for storage of data and instructions and is called internal memory / primary memory. Primary memory is also called as Random access

  Memory (RAM) Primary memory is volatile in nature. That means when the power is

  switched off, the data stored in this memory is permanently erased. That is why secondary memory is needed to store data and information permanently for later use. Some of the examples of secondary storage devices are hard disk, compact disks, pen drives etc.

Units of Memory:

- A computer system uses binary numbers to store and process data. The binary digits 0 and 1, which are the basic units of memory, are called bits.

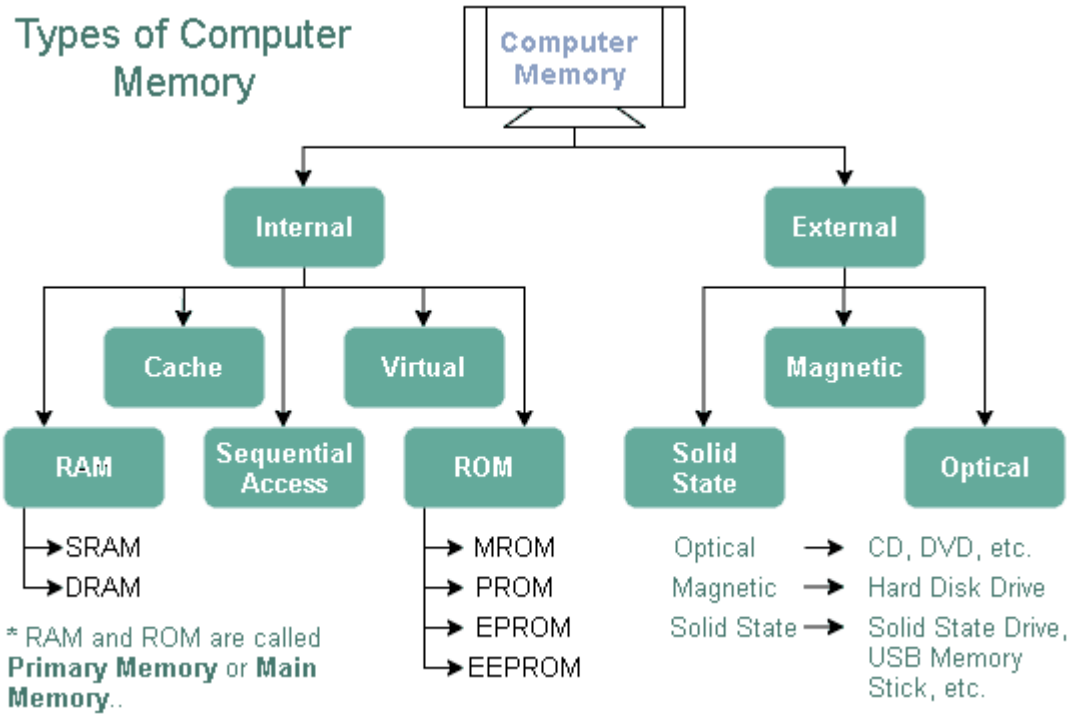
- A 4-bit word is called a Nibble. Examples of nibble are 1001, 1010, 0010, etc.

- A two nibble word, i.e., 8-bit word is called a byte, for example, 01000110, 01111100, 10000001, etc.

Measurement units for digital data

Unit	Description	Unit	Description
KB (Kilobyte)	1 KB = 1024 Bytes	PB (Petabyte)	1 PB = 1024 TB
MB (Megabyte)	1 MB = 1024 KB	EB (Exabyte)	1 EB = 1024 PB
GB (Gigabyte)	1 GB = 1024 MB	ZB (Zettabyte)	1 ZB = 1024 EB
TB (Terabyte)	1 TB = 1024 GB	YB (Yottabyte)	1 YB = 1024 ZB

Types of Memory:



RAM	ROM
1. Full form is random access memory	1. Full form is read only memory
2.Read as well as write operations can be performed	2.Only read operation can be performed
3. Ram is volatile i.e. as soon as the power supply is turned off, all the contents of RAM are erased.	3.ROM is non volatile , which means its contents are not lost even when the power is turned off.

Cache Memory:

To speed up the operations of the CPU, a very high speed memory is placed between the CPU and the primary memory known as *cache*.

DAY 3

Secondary Memory

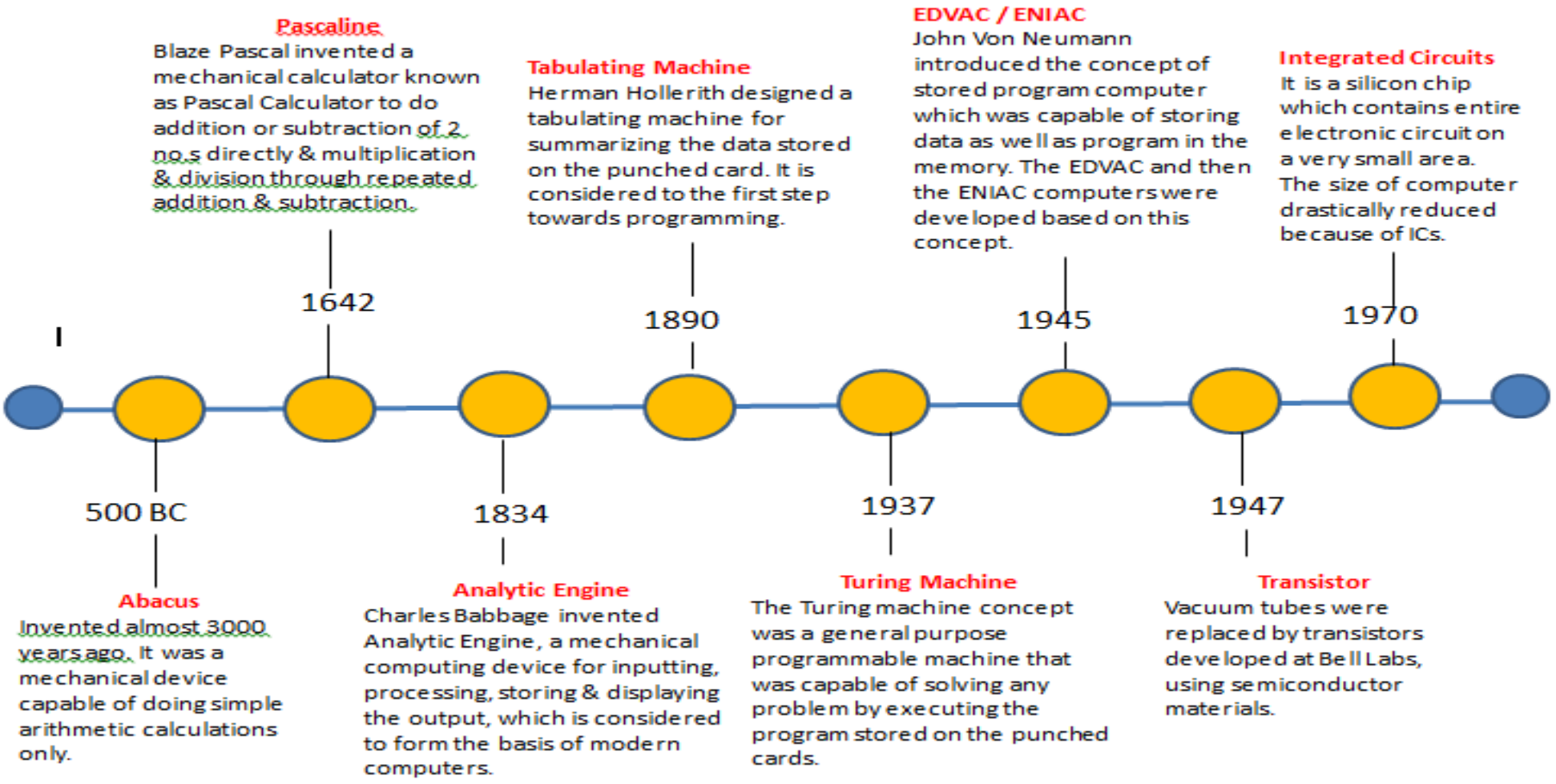
Primary memory has limited storage capacity and is either volatile (RAM) or read-only (ROM). Thus, a computer system needs secondary memory to permanently store the data for future use.

The secondary memory is non-volatile and has larger storage capacity than primary memory.
It is slower and cheaper than the main memory. But, it cannot be accessed directly by the CPU.
Contents of secondary storage need to be first brought into the main memory for the CPU to access.
Examples of secondary memory devices include Hard Disk Drive (HDD), CD/DVD, Memory Card, etc.

Output Unit :
The output unit consists of output devices that are attached with the computer. It converts the binary data coming from CPU to human understandable form. The common output devices are monitor, printer, plotter etc.

Day 4:

Computer Evolution:



Computer Generations

Generation	Hardware Components		Characteristics	Computers
First Generation (1942-1959)		⊙ Vaccum Tubes	⊙ Machine Language ⊙ Huge Size ⊙ Highly Expensive ⊙ High Consumption of Electricity	⊙ ENIAC ⊙ UNIVAC ⊙ EDVAC ⊙ EDSAC ⊙ IBM-701
Second Generation (1959-1965)		⊙ Transistors ⊙ Magnetic Tapes	⊙ Batch processing, Multiprogramming OS ⊙ Expensive ⊙ FORTRAN, COBOL	⊙ IBM 7000 ⊙ CDC 1604 ⊙ ATLAS ⊙ NCR 304 ⊙ Honeywell 400
Third Generation (1965-1975)		⊙ Integrated Circuits	⊙ Remote processing, time-sharing, Multiprogramming OS ⊙ Faster, Compact & Cheaper ⊙ PASCAL PL/1, BASIC, ALGOL-68	⊙ IBM 360/370 ⊙ PDP 8/11 ⊙ CDC 6600
Fourth Generation (1975-1988)		⊙ VLSI Microprocessor circuits	⊙ Time-sharing, real-time networks, distributed, GUI OS ⊙ Faster, Compact & Affordable ⊙ C, C++, DBASE	⊙ DEC 10 ⊙ STAR 1000 ⊙ CRAY-1/II ⊙ Apple II ⊙ VAX 9000
Fifth Generation (1988-Present)		⊙ ULSI Microprocessor circuits	⊙ Parallel Processing & Artificial Intelligence technology ⊙ C and C++, Java, .Net	⊙ IBM ⊙ Pentium ⊙ Param

DAY 5

Hardware and Software

Hardware : Hardware refers to the physical components of the computer system which can be seen and touched. For example, RAM, keyboard, printer, monitor, CPU,etc.

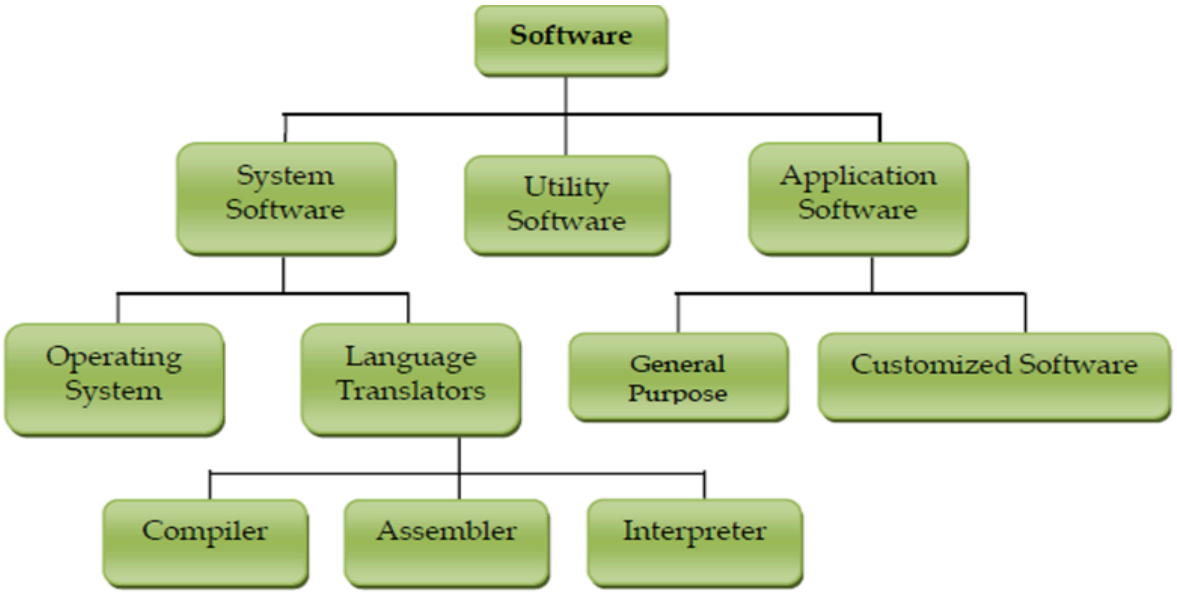
Software : Software is a general term used for computer programs that control the operations of the computer.

A program is a sequence of instructions that perform a particular task. A set of programs form a software.

Some examples of software are:

operating systems like Ubuntu or Windows 7/10, word processing tool like LibreOffice or Microsoft Word, video player like

VLC Player, photo editors like GIMP and LibreOffice draw.
A document or image stored on the hard disk or pen drive is referred to as a soft-copy.
Once printed, the document or an image is called a hard-copy.
Software can be broadly classified into three categories *viz.*
(i) System software,
(ii) Programming tools and
(iii) Application software.



i) System Software: It directs the computer what to do, when to do and how to do. System software can be further categorized into

- Operating System
- Language Translators

Examples of system software include operating systems, system utilities, device drivers, etc.

DAY 6

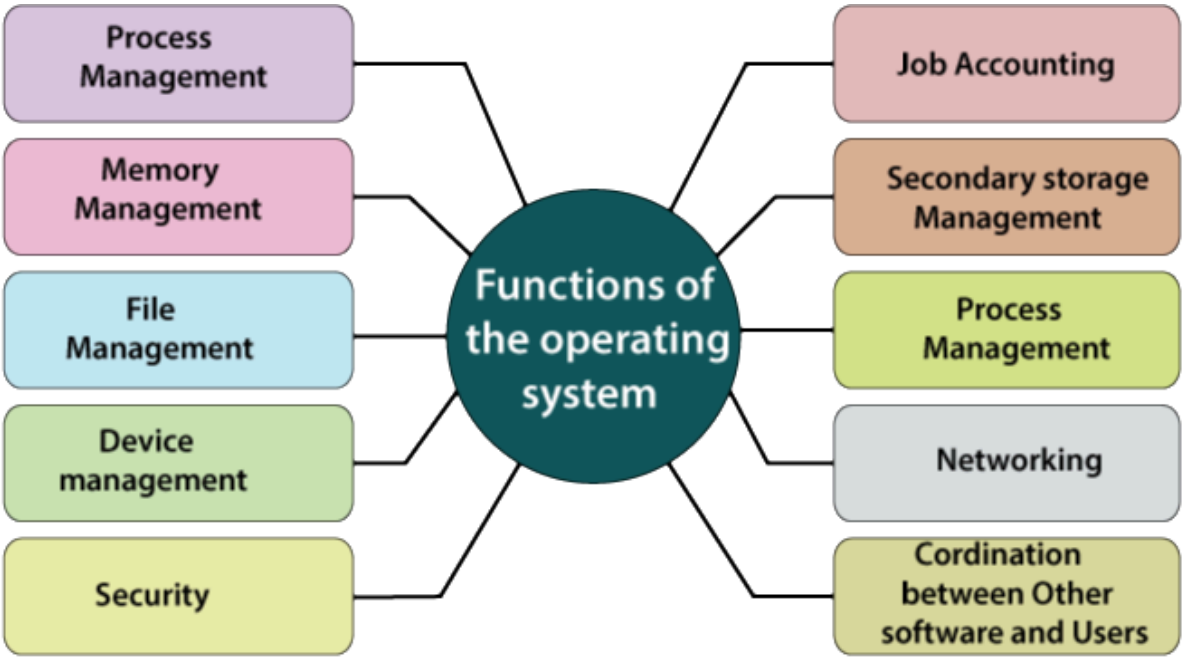
Operating system:

Operating system is a system software that operates the computer. An operating system is the most basic system software, without which other software cannot work.

Some of the popular operating systems are Windows, Linux, Macintosh, Ubuntu, Fedora, Android, iOS, etc.

Functions of Operating System:

- It manages all hardware and software, input, output and processing activities within the computer system, the flow of information to and from the processor, sets priorities for handling different tasks.
- Without operating system a computer cannot do anything useful. When a computer is switched on, the operating system is the first program that is loaded onto its memory. A user cannot communicate directly with the computer hardware.
- so the operating system acts as an interface between the user and the computer hardware.



Types of Operating System:

- Single User operating system.
- Multiuser operating system.

A single user operating system allows only one user to work at any time but a multiuser operating system allows two or more users to use a powerful computer at the same time.

For example Windows 7 is a single user operating system while Linux is a multiuser operating system.

Language Translators

As the computer can understand only machine language, a translator is needed to convert program written in assembly or high level language to machine language. The program code written in assembly or high-level language is called source code.

The source code is converted by a translator into the machine understandable form called object (machine) code.

The three types of translators used in computing systems are assembler, compiler and interpreter.

Assembler:

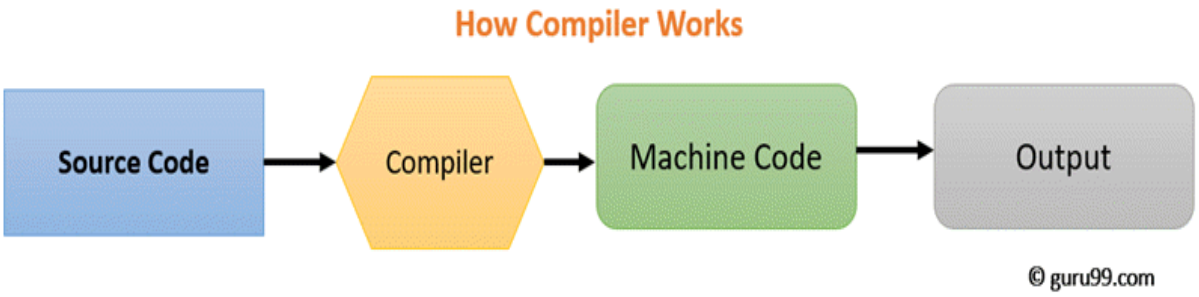
The translator used to convert the code written in assembly language to machine language is called assembler.

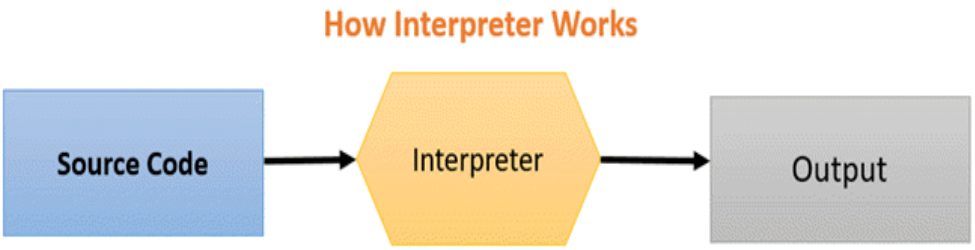
Compiler:

Compiler converts the source code into machine code. If the code follows all syntactic rules of the language, then it is executed by the computer. Once translated, the compiler is not needed.
E.g.: C++,C

Interpreter:

An interpreter translates one line at a time instead of the whole program at one go. Interpreter takes one line, converts it into executable code if the line is syntactically correct, and then it repeats these steps for all lines in the source code. Hence, interpreter is always needed whenever a source code is to be executed. E.g. Python, Java





DAY 7

Programming Tools:

In order to get some work done by the computer, we need to give instructions which are applied on the input data to get the desired outcome.

Computer languages are developed for writing these instructions. Humans are able to write

programs in high-level language, computers understand machine language.

There is a continuous need for conversion from high level to machine level language, for which translators are needed. Also, to write the instruction, code editors (e.g., IDLE in Python) are needed.

Before writing computer program using programming language it is necessary to write sequence of steps for a problem, which is called algorithm.

Algorithm:

Question 1: Write an algorithm to check whether a number is odd or even
Step 1:Input: Any number
Step 2: Process: Check whether the number is even or not
Step 3: Output: Message “Even” or “Odd”

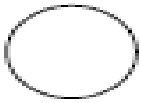
Question 2: Write an algorithm to find the square of a number.
Step 1: Input a number and store it to num
Step 2: Compute num * num and store it in square
Step 3: Print square

Homework:
1) Write an algorithm to find the greatest among two different numbers entered by the user
2) Write an algorithm to find area and perimeter of circle.
3) Write an algorithm to find area and perimeter.

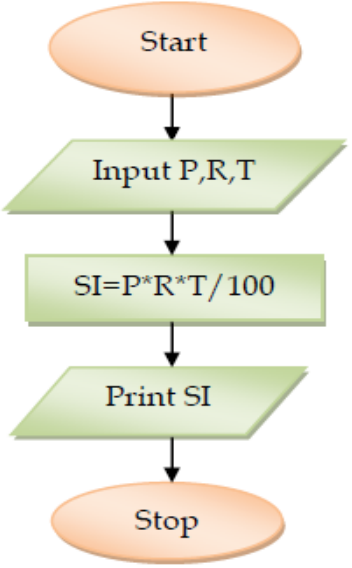
Day 8:

Flowchart: When we graphically depict the logical steps to carry out a task and show how the steps relate to each other is called flowchart.

Flowchart symbols:

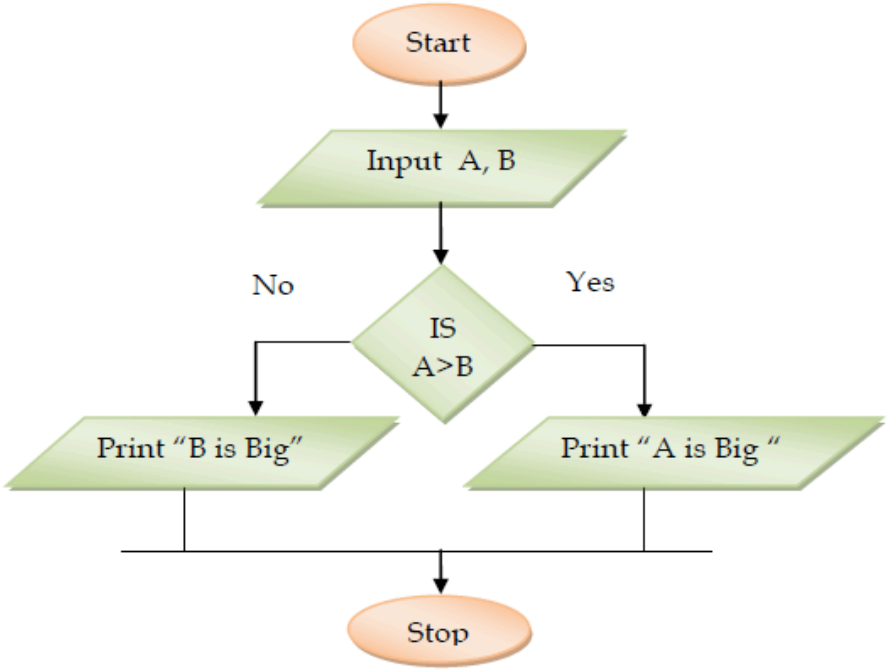
Symbols	Functions
1. 	Start/ stop
2. 	Input/ output
3. 	Processing
4. 	Decision Box
5.	Flow of control
6. 	Connector

Question 1: Draw a flowchart to find the simple interest.(sequence statement)

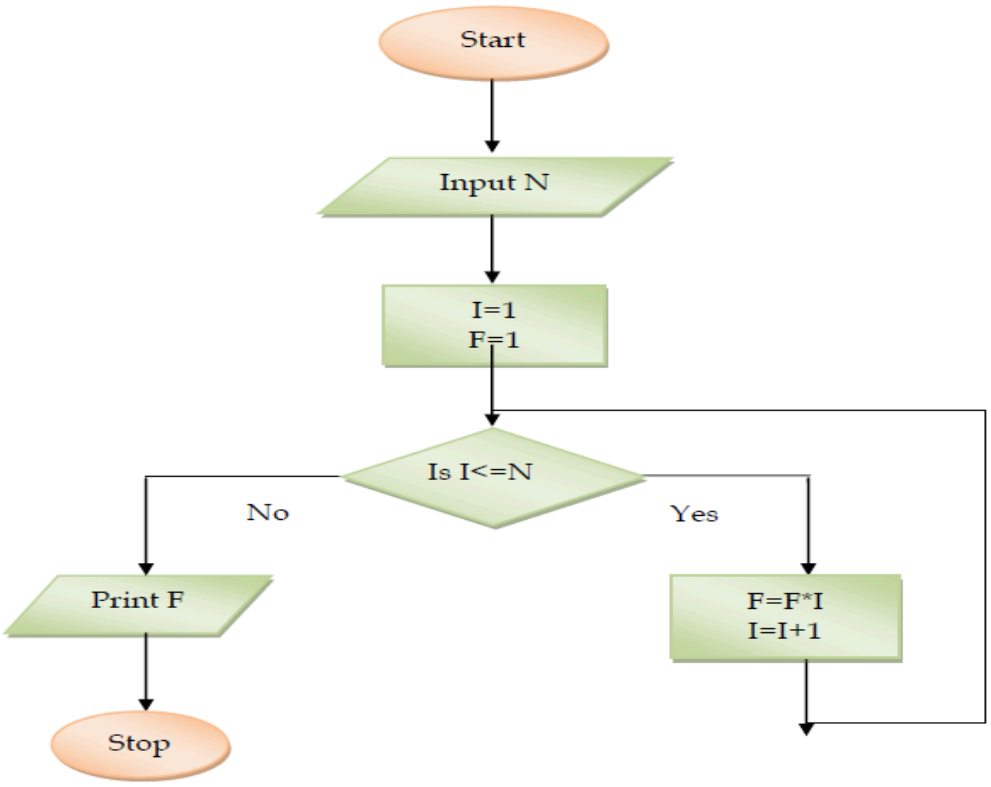


DAY 9

Question 2: Draw a flowchart to find bigger number among two numbers (selective statement)

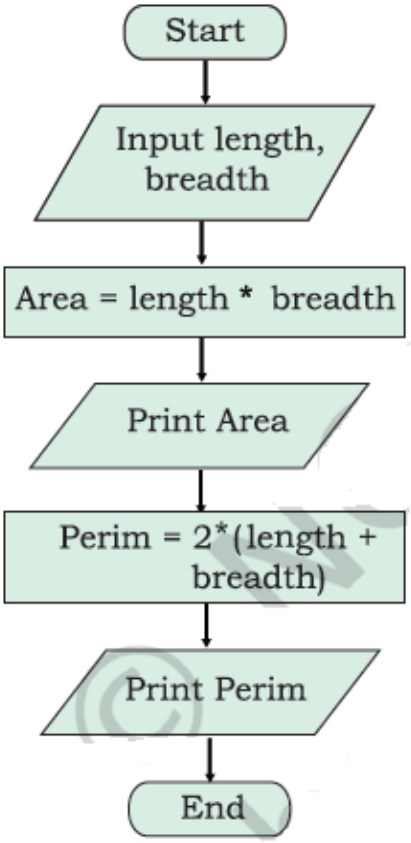


Question 3: Draw a flow chart to find factorial of any number



DAY 10

Question 4: Draw flowchart to calculate area and perimeter of a rectangle

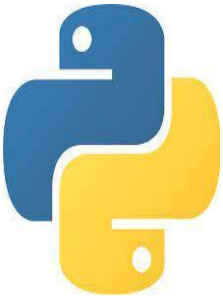


Homework:

1) Draw flowchart to check whether a number is odd or even.
2) Draw flowchart to find square of a number
3) Draw flowchart to find area and perimeter of circle

Day 11

Introduction to Python



An ordered set of instructions or commands to be executed by a computer is called a program.

Python is a very popular and easy to learn programming language, created by Guido van Rossum in 1991.

A Python program is called a script. Script is a sequence of definitions and commands.

These commands are executed by Python interpreter known as PYTHON SHELL.

In python programming, declaration of variables is not required. Memory management is automatically done.

Features of Python

1. Python is an interpreted, interactive, directly executed language.
2. It is free open-source software having large repository of libraries.
3. It is extensible and highly efficient as there is no wastage of time in declaring variables.

Advantages of Python

1. **Less learning time**– Because of simple and shorter code, lesser time is required to understand and learn python.

2. **Syntax highlighting** – It allows to distinguish between input, output and error message by different colour codes.

3. **Interpreted language** – Code execution & interpretation line by line.

How to install Python:

1) Open the official Python website https://www.python.org/downloads/ in your web browser.
2) Run the Executable Installer. Once the installer is downloaded, run the Python installer.

Where to Write python code:

1. Write python code in script mode .For this click on python IDLE then go to file then click on new file, script mode will open.

2. write source code, then click on run then click on Run module or F5 button, save your python code and run the code

Python Character Set

A set of valid characters recognized by python.

- Python uses the traditional ASCII character set.

- The latest version recognizes the Unicode character set. The ASCII character set is a subset of the Unicode character set.

Letters: a-z, A-Z
Digits : 0-9
Special symbols : Special symbol available over keyboard like $,%,@,#,! Etc.

Tokens
Smallest individual unit in a program is known as token.

1. Keywords
2. Identifiers
3. Literals
4. Operators
5. Delimiters

1. Keywords: Reserved word of the compiler/interpreter which can't be used as identifier.

2. Identifiers: A Python identifier is a name used to identify a variable

Identifier Naming Convention
1. A variable name can contain letter, digits and underscore (_). No other characters are allowed.
2. A variable name must start with an alphabet or and underscore (_).
3. A variable name cannot contain spaces.
4. Keyword cannot be used as a variable name.
5. Variable names are case sensitive. Num and num are different.
6. Variable names should be short and meaningful.

Invalid variable names – 3dgraph, roll#no, first name, d.o.b, while

3. Literals: Literals in Python can be defined as number, text, or other data that represent values to be stored in variables.

Example of String Literals in Python
name = 'Johni' , fname="johny"

Example of Integer Literals in Python(numeric literal)
age = 22

Example of Float Literals in Python(numeric literal)
height = 6.2

Example of Special Literals in Python
name = None

Day 12

Operators: Operators can be defined as symbols that are used to perform operations on operands.

Types of Operators
a. Arithmetic Operators.
b. Relational Operators.
c. Assignment Operators.
d. Logical Operators.
e. Membership Operators
f. Identity Operators

a. Arithmetic Operators.
Arithmetic Operators are used to perform arithmetic operations like addition, multiplication, division etc.

Operators	Description	Example
+	perform addition of two number	a+b
-	perform subtraction of two number	a-b
/	perform division of two number	a/b
*	perform multiplication of two number	a*b
%	Modulus = returns remainder	a%b
//	Floor Division = remove digits after the decimal point	a//b
**	Exponent = perform raise to power	a**b

E.g.:
```
print ("hello"+"python")
print(2+3)
print(10-3)
print(22%5)
print(19//5)
print(2**3)
```
Output:
```
hellopython
5
7
2
3
8
```

b. Relational Operators.: **Relational Operators are used to compare the values.**

Operators	Description	Example
==	Equal to, return true if a equals to b	a == b
!=	Not equal, return true if a is not equals to b	a != b
>	Greater than, return true if a is greater than b	a > b
>=	Greater than or equal to , return true if a is greater than b or a is equals to b	a >= b
<	Less than, return true if a is less than b	a < b
<=	Less than or equal to , return true if a is less than b or a is equals to b	a <= b

E.g.:

print(5==3) ***False***
print(7>3) ***True***
print(15<7) ***False***
print(3!=2) ***True***
print(7>=8) ***False***
print(3<=4) ***True***

c. Assignment Operators: **Used to assign values to the variables.**

Operators	Description	Example
=	Assigns values from right side operands to left side operand	a=b
+=	Add 2 numbers and assigns the result to left operand.	a+=b
/=	Divides 2 numbers and assigns the result to left operand.	a/=b
*=	Multiply 2 numbers and assigns the result to left operand.	A*=b
-=	Subtracts 2 numbers and assigns the result to left operand.	A-=b
%=	modulus 2 numbers and assigns the result to left operand.	a%=b
//=	Perform floor division on 2 numbers and assigns the result to left operand.	a//=b
**=	calculate power on operators and assigns the result to left operand.	a**=b

d. Logical Operators: Logical Operators are used to perform logical operations on the given two variables or values.

Operators	Description	Example
and	return true if both condition are true	x and y
or	return true if either or both condition are true	x or y
not	reverse the condition	not(a>b)

e. Membership Operators: It used to validate whether a value is found within a sequence such as such as strings, lists, or tuples.

Operators	Description	Example
in	return true if value exists in the sequence, else false.	a in list
not in	return true if value does not exists in the sequence, else false.	a not in list

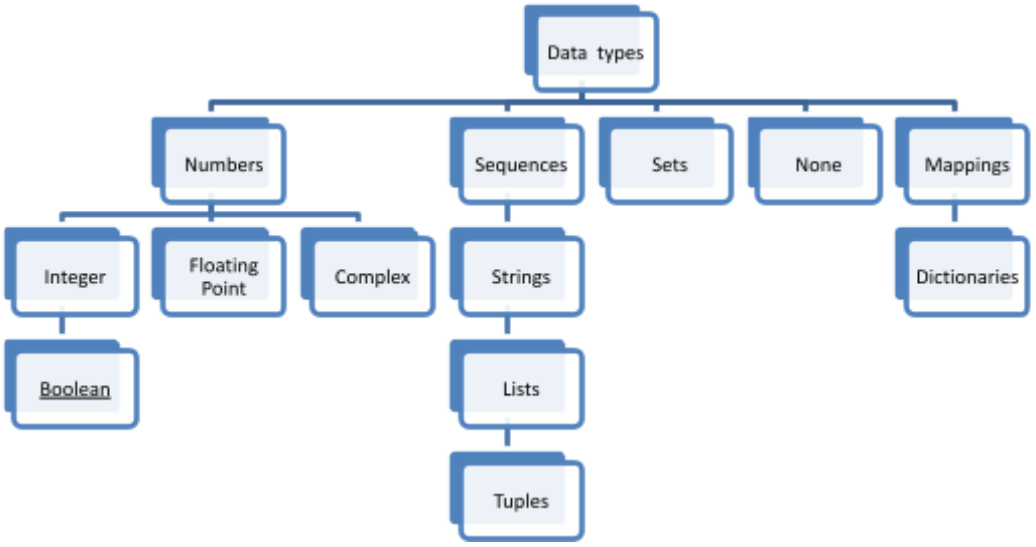
E.g. 1 **a = 22** **list = [11, 22,33,44]** **ans= a in list** **print(ans)** **Output: True**	**E.g.** **a = 22** **list = [11, 22,33,44]** **ans= a not in list** **print(ans)** **Output: False**

f. **Identity Operators: Identity operators in Python compare the memory locations of two objects**

Operators	Description	Example
is	returns true if two variables point the same object, else false	a is b
is not	returns true if two variables point the different object, else false	a is not b

DAY 14

Data Types in python



a. **int (integer): Integer represents whole numbers. (positive or negative)**
   e.g. -6, 0, 23466
b. **float (floating point numbers): It represents numbers with decimal point.**
   e.g. -43.2, 6.0
c. **Boolean (bool): It represents one of the two possible values – True or False.**

Input/Output: Python provides three functions for getting user's input.
1. input() function– It is used to get data in script mode. The input() function takes string as an argument. It always returns a value of string type.
2. print() function- it is used to print message or result

Simple Python Programs:
1) Write a Python program to find the area of a rectangle given that its length is 10 units and breadth is 20 units.
Answer:

```
length = 10
breadth = 20
area = length * breadth
print(area)
```

Output:
200

2) Program to print sum of three numbers.
Source Code:

```
var1=float(input("Enter First Number : "))
var2=float(input("Enter Second Number : "))
var3=float(input("Enter Third Number :"))
print('The sum of three numbers is:',var1+var2+var3)
```

Output:
Enter First Number : 1
Enter Second Number : 2
Enter Third Number: 3
The sum of three numbers is: 6.0

DAY 15

3) **Program to display the working of power operator in python.**
Source Code:

```
x=int(input("Enter first no : "))
y=int(input("Enter Second no : "))
pw=x**y
print(("The value of %d raised to %d is %d")%(x,y,pw))
```

Output:
Enter first no : 2
Enter Second no : 2
The value of 2 raised to 2 is 4

4) Write python code to print area and perimeter of circle
Source code:

```
r=int(input('Enter radius:'))
a=3.14*r*
p=2*3.14*r
print('Area of circle is:',a)
print('Perimeter of circle is:',p')
```

Output:
Enter radius: 1
Area of circle is: 3.14
Perimeter of circle is: 6.28

5) Program to find simple interest. Si=(p*n*r)/100
Source code:

```
principle=float(input("Enter the principle amount:"))
time=int(input("Enter the time(years):"))
rate=float(input("Enter the rate:"))
simple_interest=(principle*time*rate)/100
print("The simple interest is:",simple_interest)
```

Output is:
Enter the principle amount:200
Enter the time(years):5
Enter the rate:5.0
The simple interest is: 50.0

6) Write a program to find the average of 3 numbers
Source code:

```
a=int(input('Enter no1:'))
b=int(input('Enter no2:'))
c=int(input('Enter no3:'))
t=a+b+c
print('Average is:',t/3)
```

Output is:
Enter no1:1
Enter no2:1
Enter no3:1
Average is: 1.0