



BRIDGE COURSES

A bridge course is a type of educational program that helps students transition from one educational level to another. Bridge courses typically provide students with the skills and knowledge they need to be successful in their new educational setting.

There are many different types of bridge courses available, and they can be designed to meet the needs of individual students. Some courses focus on preparing students for a particular subject, while others offer workshops or classes that cover study skills and time management techniques.



Objectives:-

Bridge courses provide an adequate foundation in the core applied science subject. Hence students do not face any difficulties when college programs begin. This course offers a superior growth stage for students to get themselves up before starting the first semester.

They would concentrate on studies to overcome barriers between subjects taught at the pre-college level. Additionally, they will learn some of the topics in college previously.

The bridge course serves as a cradle for the new path. Before beginning the main year course, it will equip students with information. Furthermore, it will also provide certainty through interactive and dynamic learning.

Every Department is in charge of running its system by creating its syllabus. The bridge course is merely a starting point, not a destination. Institutions must follow up the bridge course regularly.

ABSTRACT OF BRIDGE COURSE (2022-2023)

SNO	Name Of The Faculty	Subject	Class	Duration	No. of Participants
1	P.Bharathi T.Aruna	Introduction to Python	MPCS/BZCS	07-02-2023 to 05-03-2023	90
2	P.Prathibha B.Swarnalatha	Fundamentals Of Information Technology	BCOM(CA) And BSC(MSTDS)	01-12-2022 to 10-01-2023	81
3	Swarnalatha T.Aruna	Introduction To Computers	BSC(MPCS)	14-12-2022 to 31-01-2023	86

ABSTRACT OF BRIDGE COURSE(2021-2022)

SNO	Name Of The Faculty	Subject	Class	Duration	No. of Participants
1	B.Swarnalatha P.Bharathi	Basic Computer Skills	BSC(BZCS) And BSC(MSTCS)	15-11-2022 to 28-12-2022	50
2	T.Aruna	Basics of Computers and Power point	BCOM	02-03-2021 to 20-03-2021	90
3	P.Prathibha	Python Programming	BSC(MPCs/ MCCS)	25-02-2021 to 20-03-2021	98

ABOUT THE WORKSHOP

"Introduction to Python" workshop will be held at Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda, on 07th February, 2023. The Aim of the workshop is to provide fundamental knowledge about Programming language and Python Programming .The faculty and students of department of computers attend the workshop.

Python Introduction

Python Introduction
Python Features
Python Applications
Getting started in python
Programming in immediate mode
Programming in script mode
input statements
output statements



Introduction to Python Programming

- | | |
|---|---|
| <ol style="list-style-type: none">1. Comments2. Arithmetic Operators3. Variables4. Data Type5. Input/Output6. Boolean Operators7. Lists8. Tuples9. Strings10. Manipulating Strings | <ol style="list-style-type: none">11. Flow control: For Loops and While Loops12. Dictionaries and Structuring Data13. Exceptions14. Functions15. Namespace16. Read and Write Files17. Sets18. Introduction to IoT using Python and Cisco Packet Tracer |
|---|---|

Prof. B. ChandraMouli , Principal

ORGANIZING COMMITTEE:

Conveners : B. Swarnalatha
: P. Prathibha
: T. Aruna
MEMBERS : P. Bharathi

Seminar hall (Room. No: 47)

ABOUT THE COLLEGE



Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda has an illustrious and developmental history. It started with pre-university courses in Arts, Commerce and Science in the building donated by Pingle family in 1965 . Since then It witnessed continuous and consistent development in expanding the courses, At present college is providing 17 U.G. and 10 P.G. courses and Certificate courses and one Add on Course, sponsored by UGC in Diploma in Front Office Management

Pingle Govt. College for Women(Autonomous), Waddepally, Hanumakonda has introduced the computer courses in the year 1998 with B.Sc Mathematics, Physics and Computer science combination. In the immediate successive year, i.e, (1998 - 1999) Computer course with B.A and B.Com classes also were introduced. Since then there has been a study and evident development of the department. Currently the courses are B.Sc (Phy. Sci.) as MPCS, MCCS, MSCS, B.Com (CA), and BSC (Life Sci. with CS) & with new courses B.Sc Data Science

**BRIDGE COURSE
ON
INTRODUCTION TO PYTHON
PROGRAMMING LANGUAGE
07TH FEBRUARY, 2023
TO
05TH MARCH , 2023**



Organized by

**DEPARTMENT OF COMPUTER
SCIENCE & APPLICATIONS**

**PINGLE GOVERNMENT COLLEGE FOR
WOMEN(AUTONOMOUS)
WADDEPALLY, HANAMKONDA
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COURSES OFFERED

Under Graduation

- B.Sc.(Maths, Physics, Computer Science)
- B.Sc.(Maths, Statistics Computer Science)
- B.Sc.(Maths, Statistics ,Data Science)
- B.Sc.(Maths, Chemistry, Computer Science)
- B.Sc.(Botany, Zoology, Computer Science)
- B.Sc.(Microbiology, Zoology, Computer Science)
- B.Com.(Computer Applications)

HIGHLIGHTS OF DEPARTMENT

ABOUT THE COLLEGE:

- Outcome Based Education
- Focus on programming hands-on
- Online Teaching Assistance through Video Lectures
- Motivation for Self learning initiatives
- Well defined student Counseling and Mentoring process
- Maintaining e-Library using QR CODES
- Well defined Teaching– Learning Process with use of Technology Based Teaching Methodologies
- Value added course such as IOT, BIGDATA, CLOUD COMPUTING, PYTHON are regularly offered to students with Online Platforms Spoken Tutorial, Coursera , Edx etc

COLLEGE WEBSITE:

<https://gdcts.cgg.gov.in/hanamkondawomen.edu>



Introduction to Python Programming is written for students who are beginners in the field of computer programming. This book presents an intuitive approach to the concepts of Python Programming for students. This book differs from traditional texts not only in its philosophy but also in its overall focus, level of activities, development of topics, and attention to programming details. The contents of the book are chosen with utmost care after analyzing the syllabus for Python course prescribed by various top universities in USA, Europe, and Asia. Since the prerequisite know-how varies significantly from student to student, the book's overall overture addresses the challenges of teaching and learning of students which is fine-tuned by the authors' experience with large sections of students. This book uses natural language expressions instead of the traditional shortened words of the programming world. This book has been written with the goal to provide students with a textbook that can be easily understood and to make a connection between what students are learning and how they may apply that knowledge.

Table of Content:

1. Introduction
2. Parts of Python Programming Language
3. Control Flow Statements
4. Functions
5. Strings
6. Lists
7. Dictionaries
8. Tuples and Sets
9. Files

What is Python?

Python is a popular programming language. It was created by Guido van Rossum, and released in 1991.

It is used for:

- web development (server-side),
- software development,
- mathematics,
- system scripting.

What can Python do?

- Python can be used on a server to create web applications.
- Python can be used alongside software to create workflows.
- Python can connect to database systems. It can also read and modify files.
- Python can be used to handle big data and perform complex mathematics.
- Python can be used for rapid prototyping, or for production-ready software development.

Why Python?

- Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc).
- Python has a simple syntax similar to the English language.
- Python has syntax that allows developers to write programs with fewer lines than some other programming languages.
- Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.
- Python can be treated in a procedural way, an object-oriented way or a functional way.

Good to know

- The most recent major version of Python is Python 3, which we shall be using in this tutorial. However, Python 2, although not being updated with anything other than security updates, is still quite popular.
- In this tutorial Python will be written in a text editor. It is possible to write Python in an Integrated Development Environment, such as Thonny, Pycharm, Netbeans or Eclipse which are particularly useful when managing larger collections of Python files.

Python Syntax compared to other programming languages

- Python was designed for readability, and has some similarities to the English language with influence from mathematics.
- Python uses new lines to complete a command, as opposed to other programming languages which often use semicolons or parentheses.
- Python relies on indentation, using whitespace, to define scope; such as the scope of loops, functions and classes. Other programming languages often use curly-brackets for this purpose.

Execute Python Syntax

```
>>> print("Hello, World!")  
Hello, World!
```

Python Indentation

Indentation refers to the spaces at the beginning of a code line.

Where in other programming languages the indentation in code is for readability only, the indentation in Python is very important.

Python uses indentation to indicate a block of code.

```
if 5 > 2:  
    print("Five is greater than two!")
```

Python Conditions and If statements

Python supports the usual logical conditions from mathematics:

- Equals: a == b
- Not Equals: a != b
- Less than: a < b
- Less than or equal to: a <= b
- Greater than: a > b
- Greater than or equal to: a >= b

Example:

```
a = 33
```

```
b = 200
```

```
if b > a:
```

```
    print("b is greater than a")
```

Python Functions

A function is a block of code which only runs when it is called.
You can pass data, known as parameters, into a function.
A function can return data as a result.

Creating a Function

In Python a function is defined using the `def` keyword:

```
def my_function():  
    print("Hello from a function")
```

Calling a Function

To call a function, use the function name followed by parenthesis:

Example:

```
def my_function():  
    print("Hello from a function")  
  
my_function()
```

Python Strings

Strings

Strings in python are surrounded by either single quotation marks, or double quotation marks.

'hello' is the same as "hello".

You can display a string literal with the `print()` function:

Example:

```
print("Hello")  
print('Hello')
```

Assign String to a Variable

Assigning a string to a variable is done with the variable name followed by an equal sign and the string:

```
a = "Hello"  
print(a)
```

Multiline Strings

You can assign a multiline string to a variable by using three quotes:

```
a = """Lorem ipsum dolor sit amet,  
consectetur adipiscing elit,  
sed do eiusmod tempor incididunt  
ut labore et dolore magna aliqua."""  
print(a)
```


Python Lists

List

Lists are used to store multiple items in a single variable.

Lists are one of 4 built-in data types in Python used to store collections of data, the other 3 are [Tuple](#), [Set](#), and [Dictionary](#), all with different qualities and usage.

Lists are created using square brackets:

Create a List:

```
thislist = ["apple", "banana", "cherry"]  
print(thislist)
```

List Items

List items are ordered, changeable, and allow duplicate values.

List items are indexed, the first item has index `[0]`, the second item has index `[1]` etc.

Ordered

When we say that lists are ordered, it means that the items have a defined order, and that order will not change.

If you add new items to a list, the new items will be placed at the end of the list.

Changeable

The list is changeable, meaning that we can change, add, and remove items in a list after it has been created.

Allow Duplicates

Since lists are indexed, lists can have items with the same value:

Lists allow duplicate values:

```
thislist = ["apple", "banana", "cherry", "apple", "cherry"]  
print(thislist)
```

Python Collections (Arrays)

There are four collection data types in the Python programming language:

- **List** is a collection which is ordered and changeable. Allows duplicate members.
- **Tuple** is a collection which is ordered and unchangeable. Allows duplicate members.
- **Set** is a collection which is unordered, unchangeable*, and unindexed. No duplicate members.
- **Dictionary** is a collection which is ordered** and changeable. No duplicate members.



Hands on Practice:



Certificate



**PINGLE GOVERNAMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
WADEPPALLY, HANUMAKONDA**

DEPARTMENT OF COMPUTER SCIENCE & APPLICATION

CERTIFICATE

This is to certify that Mr/Ms _____ of **PINGLE GOVERNAMENT COLLEGE FOR WOMEN(A), HANUMAKONDA** has successfully attended Bridge Course on “**INTRODUCTION TO PYTHON**” Organized by Department of Computer Science and Application Conducted on 07th FEBUARY 2023

DR .D Suresh Babu
CONVENER

Prof. B. Chandra Mouli
PRINCIPAL

ABOUT THE WORKSHOP

“Fundamentals of information Technology” workshop will be held at Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda, on 01ST December, 2022. The Aim of the workshop : At the end of this course, student should be able to

- Understand basic concepts and terminology of information technology.
- Have a basic understanding of personal computers and their operations.
- Be able to identify issues related to information security..



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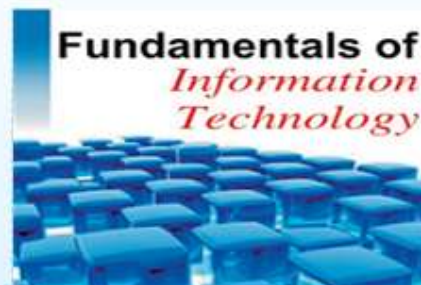
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**BRIDGE COURSE
ON
FUNDAMENTALS OF INFORMATION
TECHNOLOGY
01ST DECEMBER , 2022.
TO
10TH JANUARY , 2023**



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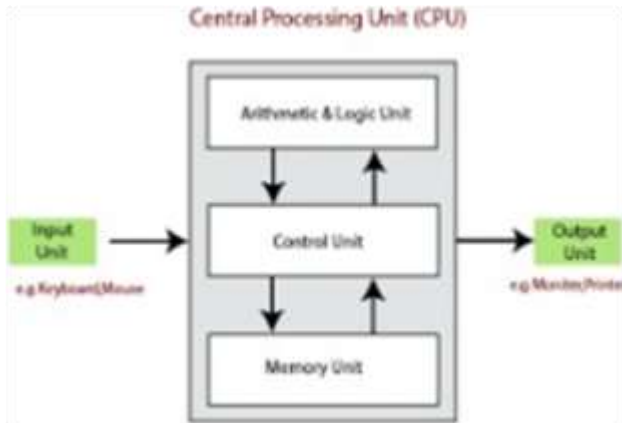
FUNDAMENTALS OF COMPUTERS

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10. COMPUTER FUNDAMENTALS – NUMBER SYSTEM
11. COMPUTER FUNDAMENTALS – NETWORKING

What is computer? Draw and explain Block diagram of computer.

Computer is an electronic device, which takes data from you through the input device and processes data according to the instructions given by the user and shows the result on output device. **CENTRAL PROCESSING UNIT**



INPUT UNIT: It is used to send input data to the computer and it is connected to C.P.U.

Alphabet, Digits, Special characters, etc... that you provide to computers is provided through Input Unit. Eg: Key Board, Mouse, Joystick, etc...

C.P.U.: C.P.U. stands for Central Processing Unit. It carries the task for processing. It can also be called the heart or brain of the computer. It consists of A.L.U., C.U. and Memory Unit.

A.L.U.: A.L.U. stands for Arithmetic Logical Unit. It performs arithmetic operations like addition, subtraction, multiplication, division and percentage. Comparisons and assignments are logical operations like $<$, $>$, $<=$, $>=$, $=$ etc... **Control Unit:** It performs internal management functions of computers. It transfers the data and instructions from input to primary memory.

It transfers data from primary memory to A.L.U. and back.

It is responsible for taking results from memory to output. So, it controls the processing and H/W devices.

Memory Unit: It can store the data. It is a storage area. It has two subunits.

(I) Primary Memory (II) Secondary Memory

I) Primary Memory: It is a temporary storage place. Whatever information given to the computer comes into primary memory, get stored there, and then they get processed. Similarly, the result of processing also gets stored in primary memory. As soon as the power is switched off, its contents get lost that's why it is called temporary memory.

Primary memory is divided into two types: a) RAM b) ROM

a) RAM: Random Access Memory.

i) It is read and write memory.

ii) It is a volatile memory (i.e. Erasable memory).

iii) It does not have necessary commands to start the computer.

b) ROM: Read Only Memory.

i) In this we can read the data, we cannot write the data.

ii) It is non-volatile memory (Non-erasable memory).

II) Secondary Memory: This is supporting memory. It can store data permanently. Eg: Floppy disks, CD's, DVD's, Hard Disks, etc...

OUTPUT UNIT: The information that is received from the computer is an output. The device used for receiving output is known as output device.

Eg: Monitors, Printers, Plotters, Speakers, etc...

Explain Characteristics of Computer.

Computer is an electronic device. It can take the data from input device and store the data, process the data with the help of instructions given by the user and shows the result on Output device.

1. **Speed:** The rate at which Computer process the instructions per second is defined as speed of Computer. Computer processes the data at an unimaginable speed. The speed of the computer ranges up to Nano seconds. Computer can calculate mathematical and logical calculations at a very fast speed. This is equivalent to the traveling speed of a light.

2. **Storage:** Computers can store large amount of data in a secured way. It is of two types **Primary Memory:** The memory, which computer uses for its internal use, is called Primary Memory. It is also called as Internal Memory.

Secondary Memory: Secondary Memory stores data permanently and it can hold Large amount of data.

3. **Accuracy:** Usually computers do not make mistakes. While computing due to human mistakes like wrong formulae, wrong methodology inaccurate results may raise. But computers always process with high accuracy. It performs calculations with greater accuracy in less time.

4. **Diligence:** There are some limitations to a human power, human being requires some rest, some limitations to their memory power many factors effect them like personal problems where as computer does not suffer from failure and loss of concentration. Diligence means being constant and earnest in effort and application. Computer can able to perform same task continuously. It process same activity at any time with same speed and accuracy.

5. **Versatility:** Computers are very versatile machines and are capable of performing multi tasks. Computers can perform a variety of jobs like generating bills, pay rolls etc with high speed and accuracy.

Explain different types of computers.

Computers are divided into four types:

- i) Micro Computers
- ii) Mini Computers
- iii) Main Frame Computers
- iv) Super Computers

i) Micro Computers: These computers are smallest category of computers. These computers consist of Micro processors hence these computers are called *Micro Computers*.

Eg: Micro Computers again two types: a) Personal Computers b) Lap top Computers

a) Personal Computer: It can perform variety types of tasks and at a given point of time only one user can work on them.

b) Lap top Computer: These computers are very small in size. It's like a briefcase. We can carry them along with us any where. They work on battery backup.

ii) Mini Computers: *Mini computers* are larger and faster than *Micro Computers*. They are designed to create multi user environment. They possess larger storage capacity and larger memory.

Eg: PDP-II, VAX, etc...

iii) Main Frame Computers: These are still larger variety of Digital Computers. They use their own circuits. This circuit is specially designed for connecting more than one terminal (Key Board, Monitor, etc...), faster speed, handling large amount of data. They are big in size and provide facility for connecting *Micro Computers* with them. Eg: DEC 20, IBM370, etc...

iv) Super Computers: *Super computers* are largest category of computers. They are designed to work with multiple *Micro Processors* so that parallel processing done.

Super Computers are used in weather forecasting, nuclear weapon design, etc... Eg: CRAY, XMP24, NEC500, etc...

Explain Input and Output devices.

Input Device: It is used to give data and instructions to the computer.

Eg: Key Board, Mouse, Trackball, Touch screens, Barcode readers, OMR, Microphone.

a) Key Board: Key Board is the main input device, using this we can enter data into the computer. It contains 101 standard keys on it. The following are the types of keys on its board.

i) Alphabetic Keys (A to Z) ii) Numeric Keys (0 to 9) iii) Special Character Keys (!, @, #, \$, %, *, etc...) iv) Function Keys (F₁ to F₁₂) v) Action Keys (Caps Lock, Tab) vi) Navigation Keys (Home, End, Page Up, Page Down) vii) Arrow Keys

b) Mouse: It is also an input device. It is called as pointing device. When a mouse is connected to the computer, an arrow like pointer appears on the screen. This pointer is called Mouse Pointer.

Using mouse we can perform the following activities:

i) Clicking the Mouse: Pressing the left button of the mouse and releasing it, is called clicking. ii) Right Click: Pressing the right button of the mouse and releasing it, is called right click iii) Dragging: Moving the mouse, with its left button pressed is called Dragging.

iv) Dropping: Moving the finger away from the mouse after Dragging is called Dropping.

c) Track Ball: A track ball is a pointing device that works like an upside down mouse. To move the cursor around the screen, you roll the ball with your thumb. It requires less space than a mouse.

d) Touch Screen: Touch Screens allow the user to point directly at the computer display usually to select from a menu of choices on the screen.

e) Bar Code readers: We have seen the wrappers of imported goods; have a series of black strips marked on them. These strips are called Barcode.

f) OMR: OMR stands for Optical Mark Reader, which acts as an input device. It is used for reading the marks that are put on some paper.

g) Microphone: It acts as input device for Computers. It is to record the voice in computers.

h) Camera: A camera can be attached with computer, as input device. Digital Camera, Web Camera, Video Camera, etc...

Output Devices: Output devices are used for showing the result.

Eg: Monitor, Printer, Plotter, Speakers and Modem.

Monitor: Monitor is an output device. It shows the results, images and videos.

There are two types of Monitors: i) CRT Monitors ii) FPD Monitors

i) CRT: This type monitor's use large vacuum tube, called Cathode Ray Tube.

ii) FPD: Flat Panel Display, it is used in Laptops. Now a days LCD's, LED's are available.

Printer: Printer is also an output device, which can be connected to the computer.

i) Dot Matrix Printer: These printers print the characters with the help of dots.

ii) Inkjet Printer: These printers print characters and drawings. These are color printers.

iii) Laser Printer: These are high quality, high speed and high cost printers. In these, printing is done using laser beam and black metallic powder called toner.

Plotters: Plotter is an output device. It is used for plotting graphs, maps and charts.

Speakers: Speakers are output devices connected to computer to produce sounds.

Modem: Modem is also an output device, abbreviation of modem is modulator and demodulator it converts signals into original formats.

Explain different types of Memories.

Memory: Memory is a storage area, where we can store data.

There are two types of memories: i) Primary Memory ii) Secondary Memory

i) Primary Memory: The memory, which computer uses for its internal use, is called *Primary Memory*. It is also called as *Internal Memory*. Computing capacity is faster.

Primary Memory is two types: a) Read Only Memory (ROM) b) Random Access Memory (RAM)

a) ROM: The memory in which, only read operations are made possible are called *Read Only Memory*. Computer cannot write anything on it. Contents of ROM are written in it by a special device. It is Non Erasable Memory. It is Permanent Memory.

PROM: Programmable Read only Memory .This memory is created by developer, we cannot erase data from this and we cannot add data into this memory.

EPROM: Erasable Programmable Read only Memory. We can add data into this memory and we can erase data from this memory. To delete data from this memory we can use special tools (UV Rays). **EEPROM:** Electrically Erasable Programmable Read only Memory. It removes the drawback of EPROM. It erase portion of the ROM also . Under this technology instead of using UV Light electric charge can be used

b) RAM: It stands for Random Access Memory. It is Writable Memory. In this computer can write data and instructions. It is Erasable Memory. It is Temporary Memory, because whenever power goes off then its contents gets lost.

RAM is two types: SRAM – It stands for Static Random Access Memory. Flip flops are used for retaining memory by SRAM. Four to six transistors are used by flip flops for a memory cell. This memory can store information till the power supply is on. This memory is faster than DRAM and is expensive. These are mainly used in processor's cache memory .It does not require refreshing, as it is quite faster in comparison to some other types.

DRAM – It stands for Dynamic Random Access Memory. It makes use of a transistor and a capacitor to form a memory cell standing for a single bit of data. They are not able to retain information for a longer time

even if the power supply is on throughout. Therefore, it needs refreshing dynamically, and therefore is known as the dynamic type of memory. This is the most common type of computer memory.

Cache memory: The Cache memory is the Volatile computer memory which is very nearest to the CPU so also called CPU memory, all the recent instructions are stored into the cache memory. It is the fastest memory that provides high speed data access to a computer processor

The memory is measured in terms of bits, bit means binary digit.

1 nibble= 4 bytes, 1 byte = 8 bits, 1 KB = 1024 bytes, 1 MB = 1024 kbs, 1 GB = 1024 mbs

1. Write about Number system and types of number system

- The number system is a way to represent or express numbers.
- A number System defines how a number can be represented using distinct symbols.
- Many number system were introduced with the passage of time like:
 - Decimal Number System
 - Binary Number System
 - Octal Number System
 - Hexadecimal Number System

Decimal Number System (Base-10)

- This number system has ten digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) so its base is 10.
- In this number system, the maximum value of a digit is 9 and the minimum value of a digit is 0.
- As it uses 10 digits to represent a number, it is also called the **base 10 number system**.
- The position of each digit in the decimal number represents a specific power of the base

(10) of the number system.

- This number system is widely used in our day to day life.
 - It can represent any numeric value. For example, the value of 786 is

$$= 7 \times 10^2 + 8 \times 10^1 + 6 \times 10^0$$

$$= 700 + 80 + 6$$

Binary Number System (Base 2)

- A computer can understand only the "on" and "off" state of a switch.

- These two states are represented by 1 and 0.
- The combination of 1 and 0 form binary numbers.
- These numbers represent various data.
- As two digits are used to represent numbers, it is called a **binary** or **base 2 number system**.
- Each binary digit is also called a **bit**.
- Binary number system is also positional value system, where each digit has a value expressed in **powers of 2**.
- Decimal equivalent of a number is sum of product of each digit with its positional value.

$$\begin{aligned}
 11010_2 &= 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 \\
 &= 16 + 8 + 0 + 2 + 0 \\
 &= 26_{10}
 \end{aligned}$$

Octal Number System (Base 8):

- This system uses digits 0 to 7 (i.e. 8 digits) to represent a number and the numbers are as a base of 8.
- Each digit in an octal number represents a specific power of its base (8).
- 1 octal digit is equal to 3 bits.
- This number system is also used to shorten long binary numbers.
- Octal number system is also a positional value system with where each digit has its value expressed in powers of 8
- Decimal equivalent of any octal number is sum of product of each digit with its positional value.

$$726 = 7 \times 8^2 + 2 \times 8^1 + 6 \times 8^0$$

$$= 448 + 16 + 6$$

$$= 470_{10}$$

Hexadecimal Number System (Base 16)

- In this system, 16 digits are used to represent a given number. Thus it is also known as the **base 16 number system**.
- Each digit position represents a power of 16.
- As the base is greater than 10, the number system is supplemented by letters.
- the hexadecimal symbols: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- It is also known as **alphanumeric number system** as it uses both numeric digits and alphabets.
- Each place value in a hexa decimal number is a power of 16.
- Decimal equivalent of any hexadecimal number is sum of product of each digit with its positional value.

Example:

$$\begin{aligned} 27FB &= 2 \times 16^3 + 7 \times 16^2 + 15 \times 16^1 + 10 \times 16^0 \\ &= 8192 + 1792 + 240 + 10 \\ &= 10234_{10} \end{aligned}$$

Name	Base	Symbols	Example
Decimal	10	0,1,2,3,4,5,6,7,8,9	(2795) ₁₀
Binary	2	0,1	111000010
Octal	8	0,1,2,3,4,5,6,7	(1576) ₈
Hexadecimal	16	0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F	3DB

Write about Boolean algebra and Boolean laws

- Boolean algebra is used to analyze and simplify the digital (logic) circuits.
- It uses only the binary numbers i.e. 0 and 1.
- It is also called as Binary Algebra or logical Algebra.
- Boolean algebra was invented by George Boole in 1854.

Rules in Boolean Algebra

Following are the important rules used in Boolean algebra.

- Variable used can have only two values. Binary 1 for HIGH and Binary 0 for LOW.
- Complement of a variable is represented by an overbar (-). Thus, complement of variable B is represented as \bar{B} . Thus if $B = 0$ then $\bar{B} = 1$ and $B = 1$ then $\bar{B} = 0$.
- ORing of the variables is represented by a plus (+) sign between them. For example ORing of A, B, C is represented as $A + B + C$.
- Logical ANDing of the two or more variable is represented by writing a dot between them such as A.B.C. Sometime the dot may be omitted like ABC.

Boolean Laws: There are six types of Boolean Laws.

Commutative law

Any binary operation which satisfies the following expression is referred to as commutative operation.

Commutative law states that changing the sequence of the variables does not have any effect on the output of a logic circuit.

$$(i) A.B = B.A$$

$$(ii) A+B = B+A$$

Associative law: This law states that the order in which the logic operations are performed is irrelevant as their effect is the same.

$$(i) (A.B).C = A.(B.C) \quad (ii) (A+B)+C = A+(B+C)$$

Distributive law: Distributive law states the following condition.

$$A.(B+C) = A.B + A.C$$

AND law: These laws use the AND operation. Therefore they are called as **AND** laws.

$$(i) A.0 = 0 \quad (ii) A.1 = A$$
$$(iii) A.A = A \quad (iv) A.\bar{A} = 0$$

OR law: These laws use the OR operation. Therefore they are called as **OR** laws.

$$(i) A+0 = A \quad (ii) A+1 = 1$$
$$(iii) A+A = A \quad (iv) A+\bar{A} = 1$$

INVERSION la

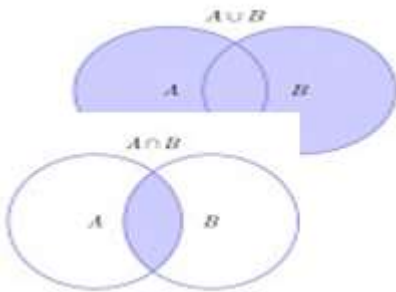
$$\overline{\overline{A}} = A$$

Write about sets?

- Sets are treated as mathematical objects.
- Similarly to numbers, we can perform certain mathematical operations on sets like intersection, union, difference, symmetric difference, and the complement of sets.
- Venn diagrams are used to visualize set operations.
- In a Venn diagram, a rectangle shows the universal set, and all other sets are usually represented by circles within the rectangle. The shaded region represents the result of the operation.

Union of Sets

The union of two sets A and B is defined as the set of elements



which are either in set A or set B or in both A and B.

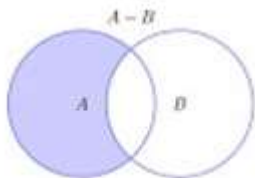
This operation is denoted by the \cup symbol.

Intersection of Sets

The intersection of two sets A and B is the set of elements which are in both sets A and B. The intersection of the two sets is written as $A \cap B$.

Difference of Two Sets

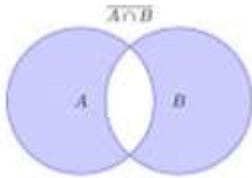
The difference of two sets A and B is the set that contains exactly all elements in A but not in B. The difference of two sets A and B is denoted by $A \setminus B$ or



$A - B$.

Symmetric Difference

The symmetric difference of two sets A and B is the set of all elements which belong to exactly one of the two original sets. This operation is



written

as $A \Delta B$ or $A \oplus B$.





Hands on Practice:



Test:



Certificate:



**PINGLE GOVERNAMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
WADEPPALLY, HANUMAKONDA**

DEPARTMENT OF COMPUTER SCIENCE & APPLICATION

CERTIFICATE

This is to certify that Mr/Ms _____ of **PINGLE GOVERNAMENT COLLEGE FOR WOMEN(A), HANUMAKONDA** has successfully attended Bridge Course on “**FUNDAMENTALS OF INFORMATION TECHNOLOGY**” Organized by Department of Computer Science and Application Conducted on 01st DECEMBER 2022

T.Aruna
CONVENER

Prof. B. Chandra Mouli
PRINCIPAL

ABOUT THE WORKSHOP

“Introduction to computers” workshop will be held at Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda, on 14TH December, 2022. The Aim of the workshop : At the end of this course, student should be able to

- (a) Understand basic concepts and terminology of information technology.
- (b) Have a basic understanding of personal computers and their operations.
- (c) Be able to identify issues related to information security.

Intro to Computers Objectives

Recognize the importance of computer literacy	Distinguish between system software and application software
Define the term, computer	Describe the categories of computers
Identify the components of a computer	Identify the elements of an information system
Discuss the advantages and disadvantages of using computers	Describe the various types of computer users
Recognize the purpose of a network	Discuss various computer applications in society
Discuss the uses of the Internet and World Wide Web	

Prof. B. ChandraMouli , Principal

ORGANIZING COMMITTEE:

Conveners : B. Swarnalatha
: P. Prathibha
: T. Aruna
MEMBERS : P. Bharathi

Seminar hall (Room. No: 47)

ABOUT THE COLLEGE



Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda has an illustrious and developmental history. It started with pre-university courses in Arts, Commerce and Science in the building donated by Pingle family in 1965 . Since then It witnessed continuous and consistent development in expanding the courses, At present college is providing 17 U.G. and 10 P.G. courses and Certificate courses and one Add on Course, sponsored by UGC in Diploma in Front Office Management

Pingle Govt. College for Women(Autonomous), Waddepally, Hanumakonda has introduced the computer courses in the year 1998 with B.Sc Mathematics, Physics and Computer science combination. In the immediate successive year, i.e, (1998 - 1999) Computer course with B.A and B.Com classes also were introduced. Since then there has been a study and evident development of the department. Currently the courses are B.Sc (Phy. Sci.) as MPCS, MCCS, MSCS, B.Com (CA), and BSC (Life Sci. with CS) & with new courses B.Sc Data Science

**BRIDGE COURSE
ON
INTRODUCTION TO COMPUTERS
14TH DECEMBER , 2022.
TO
31ST JANUARY ,2023**



Organized by

**DEPARTMENT OF COMPUTER
SCIENCE & APPLICATIONS**

**PINGLE GOVERNMENT COLLEGE FOR
WOMEN(AUTONOMOUS)
WADDEPALLY, HANAMKONDA
(Accredited with 'A' Grade by NAAC)**

COURSES OFFERED

Under Graduation

- B.Sc.(Maths, Physics, Computer Science)
- B.Sc.(Maths, Statistics Computer Science)
- B.Sc.(Maths, Statistics ,Data Science)
- B.Sc.(Maths, Chemistry, Computer Science)
- B.Sc.(Botany, Zoology, Computer Science)
- B.Sc.(Microbiology, Zoology, Computer Science)
- B.Com.(Computer Applications)

HIGHLIGHTS OF DEPARTMENT

ABOUT THE COLLEGE:

- Outcome Based Education
- Focus on programming hands-on
- Online Teaching Assistance through Video Lectures
- Motivation for Self learning initiatives
- Well defined student Counseling and Mentoring process
- Maintaining e-Library using QR CODES
- Well defined Teaching-Learning Process with use of Technology Based Teaching Methodologies
- Value added course such as IOT, BIGDATA, CLOUD COMPUTING, PYTHON are regularly offered to students with Online Platforms Spoken Tutorial, Coursera , Edx etc

COLLEGE WEBSITE:

<https://gdcts.cgg.gov.in/hanamkondawomen.edu>



FUNDAMENTALS OF INFORMATION TECHNOLOGY-(FIT)

Introduction to Computer

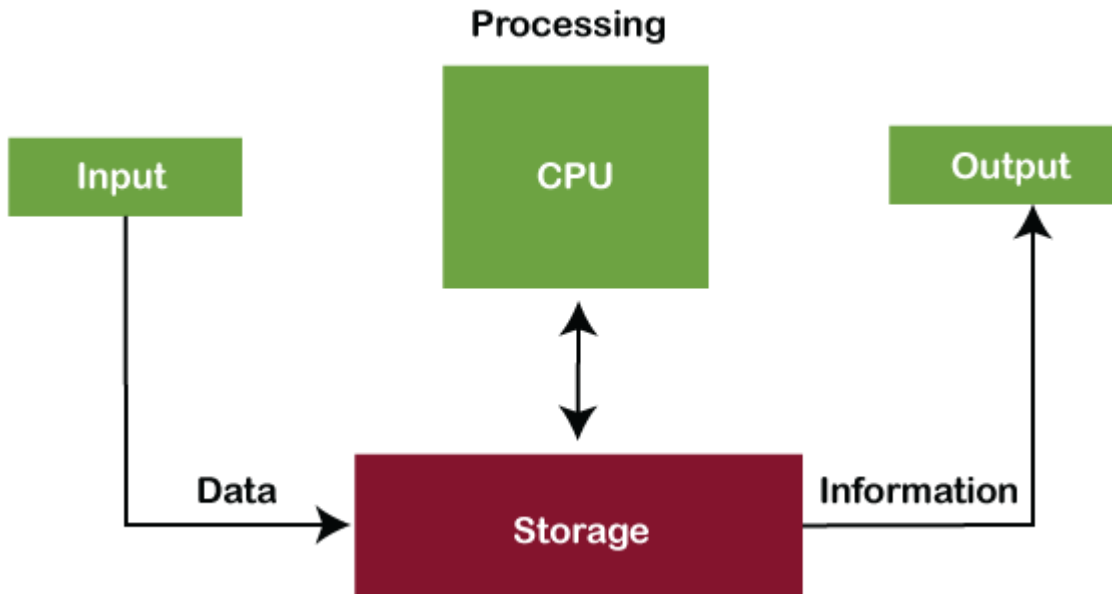
In the modern era, computers are an essential part of our everyday existence. That means computers are present in almost every field, making our day-to-day tasks easier and faster. Nowadays, computers can be seen in banks, shops, schools, hospitals, railways, and many more places, including our home. As they are such an essential part of our lives, we must know about the basic computer introduction. Let us start with defining the computer first:

What is a Computer?

The straightforward meaning of a computer is a machine that can calculate. However, modern computers are not just a calculating device anymore. They can perform a variety of tasks. In simple terms, a computer is a programmable electronic machine used to store, retrieve, and process data.

According to the definition, "**A computer is a programmable electronic device that takes data, perform instructed arithmetic and logical operations, and gives the output.**"

Whatever is given to the computer as input is called 'data', while the output received after processing is called 'information'.



Introduction to Computers:-

Fundamentals of Information Technology (FIT): - The information technology, which is exclusively designed to store, process and transmit information, is known as Fundamentals of Information Technology.

Computer: - Computer is a an Electronic device. Which accepts the *data*, it Process and storage. It gives the *Information* (results). (or)

Computer is a Group of an electronic devices. Which accepts the *data*, it Process and storage. It gives the *Information*.

*Charles Babbage is called the "Father of the computer". The First mechanical computer designed by Charles Babbage was called [Analytical Engine](#). It uses read-only memory in the form of punch cards.

Data: - Data is a collection of rawfacts. Which does not have perfect meaning is called as a data. It refers such as numbers, Characters, Symbols, images, videos, Audios,.... etc.

Process: - Process is the manipulation of data. It includes.

- 1) Calculations
- 2) Comparison
- 3) Logical Operations
- 4) Decision making

Information: - Information is the processed data. Which will have perfect meaning is called as Information. It refers such as numbers, Characters, Symbols, images, videos etc...

Ex:- H.T. No : YOMC1501
 Student Name : K.L.N.RAO
 Course : M.B.A Information
 Age : 25

 Duration: 02

CHARACTERISTICS OF COMPUTER:

The characteristics of computers that have made them so powerful and universally useful, although the computers are of various types depending on their size and capacity but all the computers have some common characteristics. As all knows that a computer has a lot of features or characteristics but in all those characteristics 5 are the most popular. Therefore the five Major characteristics of computers are given below:

- 1) Speed
- 2) Accuracy
- 3) Storage Capacity
- 4) Diligence
- 5) Versatility

1) Speed: -

Computer is a fast calculating device. The speed of computer is a managerial million instruction per second. we determine the speed of computer in terms of microsecond (10⁻⁶ part of a second) or nanosecond (10 to the power -9 part of a second). The computer works with the speed of....

1 milli second = 10⁻³ sec

1 micro second = 10^{-6} sec

1 nano second = 10^{-9} sec

1 Pico second = 10^{-12} sec

2) Accuracy: -

The degree of accuracy of computer is very high and every calculation is performed with the same accuracy. The accuracy level is 7 determined on the basis of design of computer. The errors in computer are due to human and inaccurate data. The computer gives 100% accurate results. It gives wrong results only when the data is wrongly entered and when the software is corrupted. Otherwise computer gives 100% accurate results.

3) Storage Capacity: -

Storage is one of the main aim of the computer, because it stores. The computer stores data in binary digits in binary system there are only 2 digits, there are 0's and 1's. 'Bi' means two numbers in Latin language. There are 0 and 1.

1 nibble = 4 bits

8 bits = 1 byte

1024 Bytes = 1 Kilo Byte

1024 KB = 1Mega Byte

1024 MB = 1Giga Byte

1024 GB = 1Tera Byte 1024

TB = 1Peta Byte 1024 PB =

1Exa Byte

4) Diligence: -

A computer is free from tiredness, lack of concentration, fatigue, etc. It can work for hours without creating any error. If millions of calculations are to be performed, a computer will perform every calculation with the same accuracy. Due to this capability it overpowers human being in routine type of work. If we make the computer to work for 24 hours for a day, it works with the same speed and gives 100% accurate result.

5) Versatility: -

The computer never gets confused. It performs multitasking jobs at a time with the same Speed and gives 100% accurate result. It means the capacity to perform completely different type of work. We can use computer to prepare payroll slips. Next moment you may use it for inventory management or to prepare electric bills.

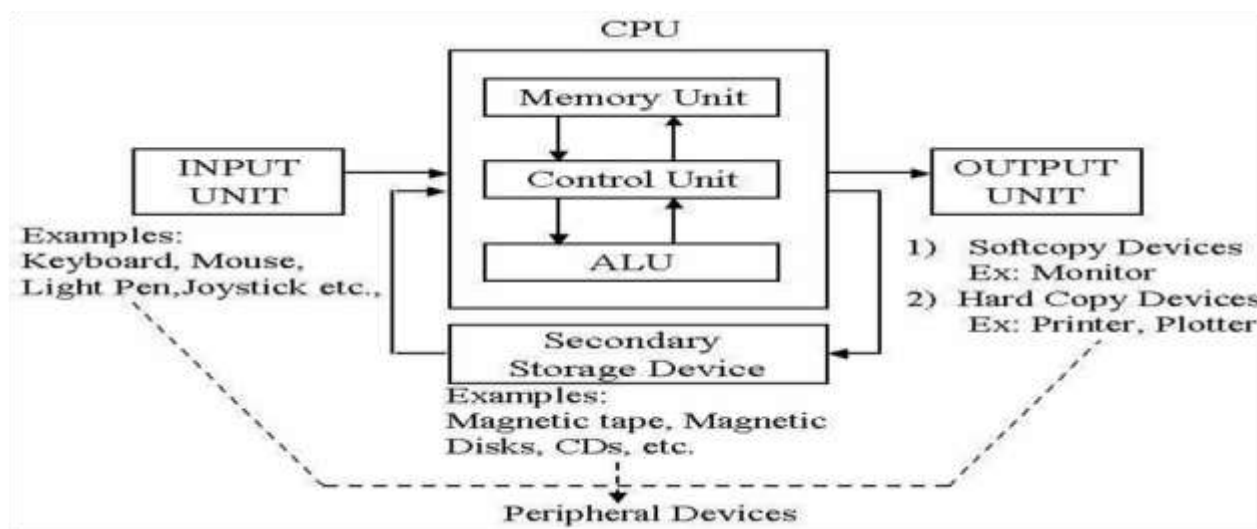
Evolution of Computer:-

The evolution of digital computing is often divided into generations. Each generation is characterized by dramatic improvements over the previous generation in the technology used to build computers, the internal organization of computer systems and programming languages.

**Block Diagram of Computer:

Input Unit:-

The data given to the system (or) Fed the data into the computer system CPU (Central Processing System) is called as a computer input.



Central Processing System (CPU):-

CPU is also called as heart of the computer, all major calculations; comparisons are made inside the CPU. CPU is divided into 3 units.

- 1) Arithmetic Logic Unit
- 2) Control Unit
- 3) Memory Unit

1) Arithmetic Logic Unit: -

Arithmetic Logic Unit performs all the arithmetic, relational and logical calculations.

- The arithmetic operations are + , - , * , %
- The relational operations are > , < , <= , > = , ==
- Logical operations are AND ,OR , NOT

2) Control Unit: -

Control unit controls whole the computer. It takes the data and instructions from the memory unit and understands the instructions & sends the data to different parts of the computer for processing it takes the information stores in the memory unit and sends it to the required output device. The data is transferred from one place to another place with the help of 'BUS'.

3) Memory Unit: -

The data and instructions given to the computer should be stored in some storage place, that storage place is called as memory unit. Memory unit has two types.

- i) Primary memory
- ii) Secondary memory

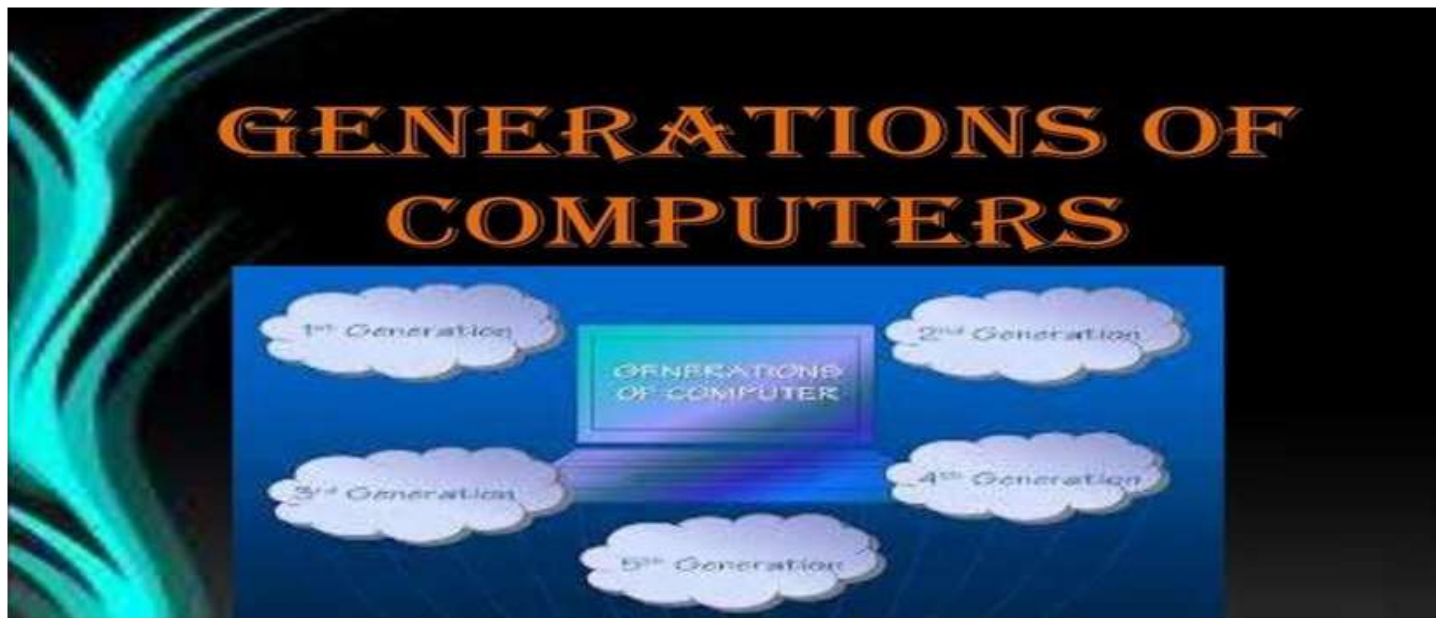
Output Unit: -

The information taken from the CPU is called as an output. An output device is any hardware device used to send data from a computer to another device or user, it is processed data.

***GENERATIONS OF COMPUTERS:**

Generation in computer terminology is a change in technology a computer being used. Initially, the generation term was used to distinguish between varying hardware technologies. Nowadays, generation includes both hardware and software.

There are five computer generations known till date. Each generation has been discussed in detail along with their time period and characteristics, approximate dates against each generation have been mentioned. Following are the main five generations of computers.



1) FIRST GENERATION OF COMPUTERS (1942-1954)

The computers of first generation used vacuum tubes as the basic components for memory and circuitry for CPU (Central Processing Unit). These tubes, like electric bulbs, produced a lot of heat and the installations used to fuse frequently. Therefore, they were very expensive and only large organizations were able to afford it. In this generation, mainly batch processing operating system was used. Punch cards, paper tape, and magnetic tape was used as input and output devices. The computers in this generation used machine code as the programming language.

The main features of First Generation are:-

- Vacuum tube technology
- Supported Machine language only
- Very costly
- Generate lot of heat
- Slow Input / Output device
- Huge size
- Need of A.C.
- Consumed lot of electricity



2) SECOND GENERATION OF COMPUTERS (1954-1964)



In this generation, transistors were used that were cheaper, consumed less power, more compact in size, more reliable and faster than the first generation machines made of vacuum tubes. In this generation, magnetic cores were used as the primary memory and magnetic tape and magnetic disks as secondary storage devices. In this generation, assembly language and high-level programming languages like FORTRAN, COBOL was used. The computers used batch processing and multiprogramming operating system.

The main features of second generation are:-

- Use of transistors
- Smaller size as compared to First generation computers
- Generate less heat as compared to First generation computers
- Consumed less electricity as compared to First generation computers

- Faster than first generation computers
- Still very costly
- A.C. needed
- Support machine and assembly languages

3) THIRD GENERATION OF COMPUTERS (1964-1972)

The computers of third generation used Integrated Circuits (ICs) in place of transistors. A single IC has many transistors, resistors, and capacitors along with the associated circuitry. The IC was invented by Jack Kilby. This development made computers smaller in size, reliable, and efficient. In this generation remote processing, time-sharing, multiprogramming operating system was used. High-level languages (FORTRAN-II TO IV, COBOL, PASCAL PL/1, BASIC, ALGOL-68 etc.) were used during this generation.



The main features of third generation are:-

- In this generation Remote processing
- IC used

- More reliable
- Smaller size
- Generate less heat
- Faster
- Lesser maintenance
- Still costly
- A.C needed
- Consumed lesser electricity
- Support high level language

4) FOURTH GENERATION OF COMPUTERS (1972-1990)

The fourth generation of computers used Very Large Scale Integrated (VLSI) circuits. VLSI circuits having about 5000 transistors and other circuit elements with their associated circuits on a single chip made it

possible to have microcomputers of fourth generation. Fourth generation computers became more powerful, compact, reliable, and affordable. As a result, it gave rise to Personal Computer (PC) revolution. All the high- level languages like C, C++, DBASE etc., were used in this generation.



The main features of fourth generation are:-

- VLSI technology used
- Portable and reliable
- Use of PC's
- Very small size
- No A.C. needed
- Concept of internet was introduced
- Great developments in the fields of networks

5) FIFTH GENERATION OF COMPUTERS (1990-till date)

In the fifth generation, VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.



This generation is based on parallel processing hardware and AI (Artificial Intelligence) software. AI is an emerging branch in computer science, which interprets the means and method of making computers think like human beings. All the high-level languages like C and C++, Java, .Net etc., are used in this generation.

AI includes:-

- Robotics
 - Neural Networks
 - Game Playing
 - Development of expert systems to make decisions in real-life situations
 -
- Natural language understanding and generation

The main features of fifth generation are:-

- All the Higher level languages like C and C++, Java, .Net etc. are used in this generation.
- Robotics
- All the Higher level languages like C and C++, DBASE etc. were used in this generation.
- Game Playing
- Development of expert systems to make decisions in real life situations.
- Natural language understanding and generation.
- Some computer types of this generation are:
 - Desktop & Laptop

***CLASSIFICATION OF COMPUTERS:**

Computer can be classified based on their principles of operation or on their configuration. By configuration means purpose, size and speed of doing computation and storage capacity of computer. Types of computers based on principles of operation.

There are three types of computers according to the principles of operation. Those 3 types of computers are.

- 1) ANALOG COMPUTER
- 2) DIGITAL COMPUTER
- 3) HYBRID COMPUTER

1) ANALOG COMPUTER:-

Analog computer system is the very old computer system which operates on the mathematical variables in the form of continuously changeable physical quantities/entities like mechanical, electrical, hydraulic, etc. They use continuous values rather than discrete values so they work on analog signal. At the time of 1950s–1960s these analog computers were first used. Analog computers are limited in accepting the problems and also they can never be extremely accurate.

Analog computer is a computing device that works on continuous range of values, it generally, deals with physical variables such as voltage, pressure, temperature and speed. Analogue computers are used in some specific applications, like the flight computer in aircraft, ships, submarines, and some appliances around us like the refrigerator, speedometer of bike, etc.

2) DIGITAL COMPUTER: -

They are the computers that perform various computational as well as some other general purpose tasks. The information in these computers is represented by variables that take a limited number of discrete values. Those computers work on a digital signal. These signals are used to represent data as a sequence of discrete values; at any given time it can only take on one of a finite number of values.

Digital computer operates on digital data such as numbers. It uses Binary number system in which there are only two digits, 0 and 1. Digital computers can give more accurate and faster results. Based on purpose,

digital computer can be further classified as

- i) General purpose computers
- ii) Special purpose computers

i) General purpose computers:- These computers are used for any types of application. Most of the computers that use today are general purpose computers.

ii) Special purpose computers:- these type of computers are used for weather forecast.

3) HYBRID COMPUTER (Analog + Digital): -

The hybrid computers are a combination of computers those are capable of inputting and outputting in both digital computers and [analog computer signals](#). A hybrid computer system setup offers a cost effective method of performing complex simulations.

Types of Computers based on configuration: -

The capabilities of each type of computers are Different. The types of listed below.

1. Super computers
2. Mainframe computers
3. Mini computers
4. Workstation computers
5. Micro computers
 - i) Desktop computers
 - ii) Notebook pc(Laptop)
 - iii) Handheld computer(Tabs)

1. Super Computers:

The fastest and most powerful type of computer Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. For example, weather forecasting requires a [supercomputer](#). Other uses of supercomputers include animated graphics, fluid dynamic calculations, nuclear energy research, and petroleum exploration.

2. Mainframe Computers:

A very large and expensive computer capable of supporting hundreds, or even thousands, of users simultaneously. In the hierarchy that starts with a simple [microprocessor](#) (in watches, for example) at the bottom and moves to supercomputers at the top, mainframes are just below supercomputers. In some ways, mainframes are more powerful than supercomputers because they support more simultaneous programs. But supercomputers can execute a single program faster than a mainframe.

3. Mini Computers:

A midsized computer. In size and power, minicomputers lie between workstations *and* mainframes. In the past decade, the distinction between large minicomputers and small mainframes has blurred, however, as has the distinction

between small minicomputers and workstations. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

4. Workstation Computers:

A terminal or desktop computer in a network. In this context, workstation is just a generic term for a user's machine (client machine) in contrast to a "server" or "mainframe."

5. Micro Computers / Personal Computers:

∅ Desktop Computer: a personal or micro-mini computer sufficient to fit on a desk.

∅ Laptop Computer: a portable computer complete with an integrated screen and keyboard. It is generally smaller in size than a desktop computer and larger than a notebook computer.

∅ Palmtop Computer/Digital Diary /Notebook /PDAs: a hand-sized computer. Palmtops have no keyboard but the screen serves both as an input and [output device](#).

APPLICATIONS OF COMPUTER:

· Computer can be used in various fields as the functionality of the computers has been increased. Different fields in which computer is being used are given below.

- 1) Business
- 2) Education
- 3) Medicine and Healthcare
- 4) Science and Engineering
- 5) Manufacturing
- 6) Music
- 7) Multimedia
- 8) Internet

1) Business:-

Business people and organizations use computers for different purposes. Business clearly sees the interest as a way to enhance productivity and competitiveness. Some areas of business that are undergoing rapid changes are sales and marketing, retailing, banking, stock trading, etc. The world of cyber cash has come to banking – not only smart cards but internet banking, electronic deposit, bill paying, online stock and bond trading, etc.

2) Education:-

In the field of education computer can be used for interactive learning students can learn

something easily using computer based tutors. Getting the right kind of [information](#) is a major challenge as is getting information to make sense. College students spend an average of 5-6 hours a week on the [internet](#). Research shows that computers can significantly enhance performance in learning. Students exposed to the internet say they think the web has helped them improve the quality of their academic research and of their written work.

3) Medicine & Health care:-

Computer technology is radically changing the tools of medicine. All medical information can now be digitized. Software is now able to [computer](#) the risk of a disease. Mental health researchers are using computers to screen troubled teenagers in need of psychotherapy. A patient paralyzed by a stroke has received an implant that allows communication between his brain and a computer; as a result, he can move a cursor across a screen by brainpower and convey simple messages. Several medical applications use computers for storing, scanning reports and analysis of scanning etc.

4) Science and Engineering:-

Scientists have long been users of it. A new adventure among scientists is the idea of a “collaborator”, an internet based collaborative laboratory, in which researchers all over the world can work easily together even at a distance.

An example is space physics where space physicists are allowed to band together to measure the earth’s ionosphere from instruments on four parts of the world. Scientists use computers to simulate complex events such as predicting earth quakes, satellites use computers for day functioning.

5) Manufacturing:-

Computer has increased its role in the field of manufacturing. They are used for automated operation of machines. Computers compile statistics, sell tickets, create training programs and diets for athletes, and suggest game plan strategies based on the competitor's past performance.

6) Music:-

Computer can be used to play music and the can be used for editing sounds. In movies, computer generated graphics give freedom to designers so that special effects and even imaginary characters can play a part in making movies, videos, and commercials.

7) Multimedia:-

Computer can be used to design multimedia applications and also to play them. Now-a-days most of the games and web applications use multimedia.

8) Internet: - Computers across the globe can be connected by internet. It allows E-mails, chatting and sharing resources among the users of computers.

Capabilities and Limitations of Computer:

The capabilities of a computer system are speed, reliability, adaptability, storage and accuracy.

Computers systems are well adjusted to perform repetitive tasks. They never get tired, bored or fatigued.

Limitations of Computer:-

- a) No thoughts
- b) No Decision - making power
- c) No Learning power
- No Self-Intelligence. Computer does not have intelligence of its own to complete the tasks.
- No Thinking and Decision Making Power. The computer cannot think itself.
- No Feeling. Lack of feeling is another limitation of computer.

*Input &

Output

Devices: Input

Devices:-

- Input devices are all those hardware equipment that are used to enter data into the computer.
- The data given to the CPU (Computer System) is called as an Input Devices. Input devices are required for user to communicate with the computer.
- Input devices bring information into the computer. Different types of input devices sent different types of data into the computer. These devices are called as input devices.

1. Keyboard
2. Mouse
3. Touch screen
4. Scanner
5. Joystick
6. Light pen
7. Barcode reader
8. Digital camera
9. Optical Mark Recognizer(OMR)
10. Optical Character Recognizer(OCR)
11. Micro Phone..etc.

1. **Keyboard:** This device is used to type the information into the computer and it contains the number keys(0-9),Alpha keys (A-Z (or) a - z), Function keys(F1-F12) & Navigation keys (Alt, Enter, Shift etc)Generally standard keyboard has 104 keys

2. **Mouse:** - It is a small device. Used to point a particular place on the screen. The desk to move the pointer or cursor on the screen. It can perform functions like selecting menu commands, moving icons, resizing windows, starting programs and choosing options.

3.

Touch Screen: - The user to operate or make selections by simply touching the display screen. It gives the instructions to the computer. Ex: ATM & Touch mobile phones etc...

4. **Scanner**: - Scanner is an input device. It is used to direct data entry from the source document in the computer system and also to scan the any type image (or) document.

5. **Joystick**: - The joystick is a vertical stick. Which moves the graphic cursor in a direction, the stick is moved. Joysticks are often used to control video games and primarily used in playing video games.

6. **Light Pen**: A light pen is a computer an input device. a light pen is similar to a mouse. A Light pen CAD software can be used to create two-dimensional (2-D) drawings (or) three- dimensional (3-D) models have the advantage of 'drawing' directly onto the screen. CAD (Computer-Aided Design) software is used by architectures, engineers, drafters, artists, and others to create precision drawings.

7. **Barcode Reader**: BCR or scanner, also known as a point of sale (POS) scanner is a hardware device, capable of reading a barcode.

a. It can use also print out the details of the product (or) long information about that product into a database.

8. **Digital Camera**: - This camera that stores images digitally rather than recording them on film. Once a picture has been taken, it can be downloaded to a computer system, and then manipulated with a graphics program and printed

9. **OMR**:-OMR scanning is fast, accurate and cost effective. OMR scanning is easy to implement and support. This device is specially pre-defend forms are designed with boxes, that can be marked with a pencil (or) pen. Such the marks into electrical pulses that are transmitted to the computer. Document is read by OMR which transcribes.

10. **OCR**:-This device is capable of detecting alphabetic and numeric character on a computer. The main advantage of this device is, it makes data enter simpler and faster. By reading the entered test into the device is more natural away then typing.

11. **Microphone:** It is an input device to input sound that is then stored in digital form. The microphone is used for various applications like adding sound to a multimedia presentation or for mixing music.

OUTPUT DEVICES:-

∅

The Information taken from the CPU (Computer System) is called as an Output Devices and also Output is the Processed Data. Output devices are:

1. Monitor
2. Printer
3. Plotter
4. Speakers
5. Projector
- 6.

Headsetetc

1.

Monitor: This is a standard output *device*. A display screen used to provide visual output from a Computer, and T.V. like screen used to show pictures and words.

2. **Printer:** It is an Output device and also used to make from the computer. To print the any kind of document (or) image (or) file on the paper. A paper copy of the information.

3. **Plotter:** - It is a computer hardware device. Much like a printer that is used for printing vector *graphics*. Instead of the traditional toner, plotters use a pen, pencil, marker, or other writing tool to draw a design onto paper.

4. **Speaker:** - This device that converts analog audio signals into the equivalent air vibrations in order to make audible sound.

5. **Projector:** - It is a type of [video projector](#) for displaying video, images or computer data on a screen. It is a modern equivalent of the [slide projector](#).

- Projector is used in meetings to help ensure that all participants can view the information being presented.
6. **Headset:-** A headset unit containing a microphone and one or two speakers. Employed in *call centers* and phone-intensive jobs, headsets allow people to easily have a phone conversation while using the computer.

Computer Software and Hardware

Software

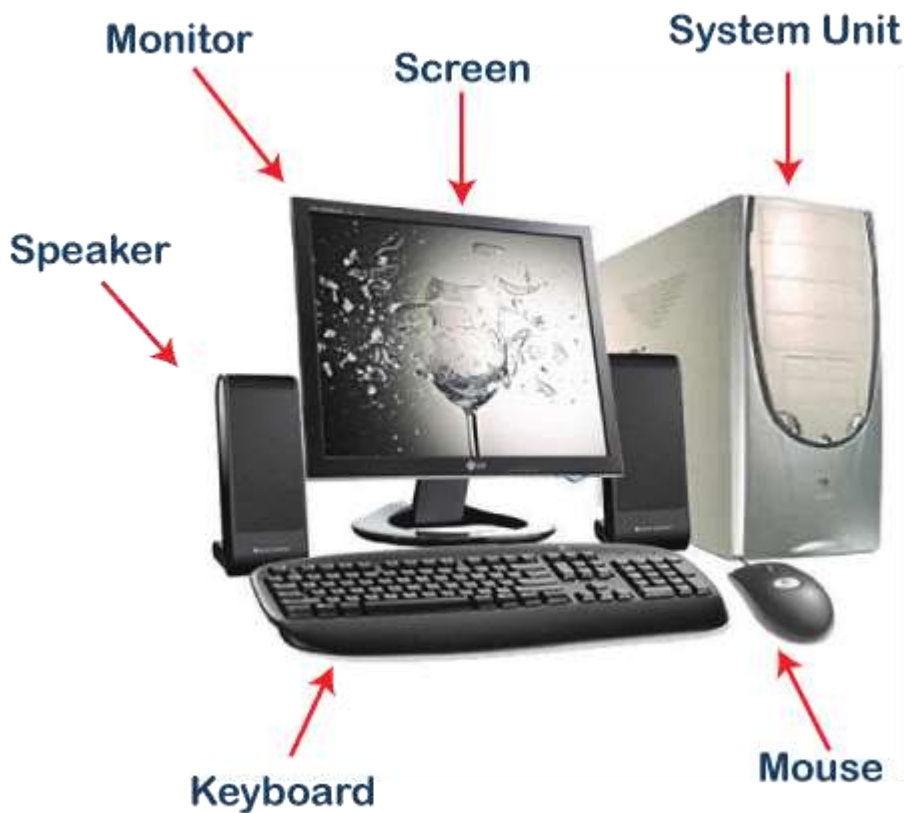
Computer software is a group of instructions or programs that instructs the computer system to work accordingly. There are mainly two types of software:

System Software: System software help establish communication between hardware components so that the user can interact with the computer. These types of software are necessary for the computer to operate correctly. They provide an interface to run additional third party programs or utility tools. Operating systems, drivers, utility software, and firmware are typical examples of the system software.

Application Software: Application software is designed to help users to perform specific tasks, such as online surfing, setting the alarm, listening to music, playing videos, photo designing, editing, etc. This type of software mostly runs in the frontend and allows end-users to work on. Web browsers, Photoshop software, multimedia software and word processors are the example of the application software.

Hardware

The physical parts attached to a computer that form a whole computer are called **hardware** or hardware components. There can be different types of hardware, depending on the structure. Some most common hardware are **mouse, keyboard, monitor, printer**, etc. These are the parts that can be seen and touched by humans.



Basic Parts of Computer

The essential components of the computer can be defined as follows:

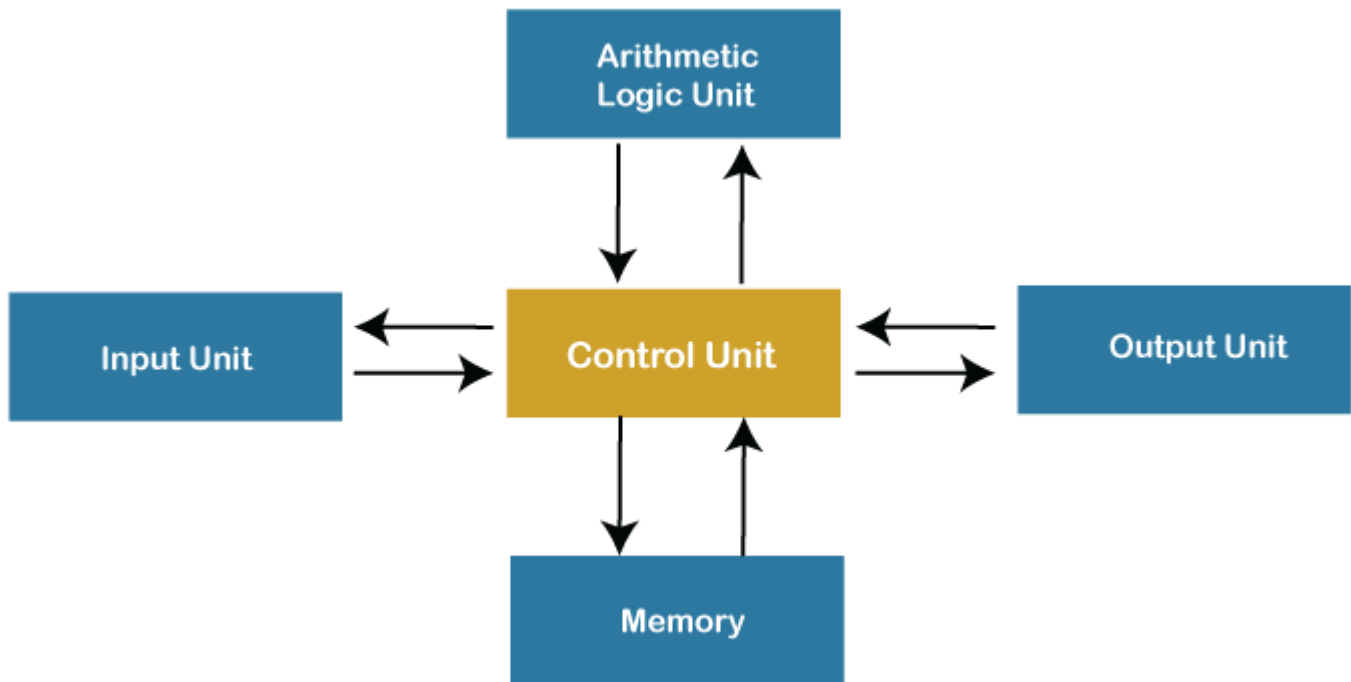
Input Unit: Input Units or devices are used to input the data or instructions into the computers. Some most common input devices are mouse and keyword.

Output Unit: Output Units or devices are used to provide output to the user in the desired format. The most popular examples of output devices are the monitor and the printer.

Control Unit: As its name states, this unit is primarily used to control all the computer functions and functionalities. All the components or devices attached to a computer interact with each other through the control unit. In short, the control unit is referred to as '**CU**'.

Arithmetic Logic Unit: The arithmetic logic unit helps perform all the computer system's arithmetic and logical operations. In short, the arithmetic logic unit is referred to as '**ALU**'.

Memory: Memory is used to store all the input data, instructions, and output data. Memory usually has two types: **Primary Memory** and **Secondary Memory**. The memory found inside the **CPU** is called the primary memory, whereas the memory that is not the integral part of the **CPU** is called secondary memory.



Functions of Computer

here are four core functions of the computer, as explained below:

Input: Whatever is given to a computer is called the input. The input data is given to the computer using the input devices. The computer only takes data in a binary form (raw format). The input devices help convert the entered data in the binary form to be understandable by the computer. Data can be inputted in various forms, such as letters, numbers, images, etc.

Processing: Processing is the primary function of the computer. CPU helps to process the data according to the instructions entered into the computer system. The processing of data is an internal process of the computer system, and the data is executed in a queue. After the processing has been completed, the data is further transferred as the output. The processor (CPU) is the computer's brain, and it is a microchip. The processor's speed varies in different computers because it depends on several factors, such as the type of CPU, memory, and motherboard.

Typically, the following operations are performed on the data during the processing:

- Arithmetic Operations, such as addition, subtraction, multiplication, differentials, square root, etc.
- Logical Operations, such as equal to, not equal to, greater than, less than, opposite, etc.

Output: Anything that comes out from the computer is called the output. It is the human-readable data and displayed on the computer screen (monitor). Output can be stored in the storage devices if desired. The output devices help convert the processed data of the CPU into the human-understandable form.

Storage: The device used to store the data of a computer system is called the storage. Storage devices help to store digital data. They can store the data while the computer is operating and after processing. There are volatile and non-volatile storage options. The volatile storage can store the data as long as the

power source is connected, whereas non-volatile can store the data permanently even after the power source is disconnected.

Characteristics of Computer

The essential characteristics of the computer make it such an important part of human lives. Let's understand the basic characteristics of computers:

Speed: Computers are a high-speed electronic machine. They can carry around 3-4 million instruction per second. Even advanced computers can handle trillions of instructions per second, cutting down the time to perform any digital tasks.

Accuracy: Computers are also known for their accurate performance. They can complete the given jobs at almost 100% accuracy. Although errors may occur in computers, they are usually caused by incorrect input, incorrect instructions, or bugs in chips. All of these are human errors.

Storage Capacity: Computers can easily store a massive size of data. Modern computers come inbuilt with high storage features compared to older days. Additional data can be stored on secondary devices like external hard disks, or flash memory, etc. Due to incredible speed, data can be retrieved from storage in no time.

Reliability: Computers are reliable and consistent; they can process the same tasks any number of times without throwing any error. Computers don't get tired like humans, so they are superior to perform rule-based, repetitive tasks.

Versatility: The variety of tasks that a computer can perform are almost infinite. That means computers can perform different tasks back to back without making errors; they are no longer just a computing machine. For one moment, a computer can be used to perform data entry tasks or ticket booking, and the very next moment, it can be used for complex mathematical calculations or continuous astronomical observations, etc.

Classification of Computer

According to physical size, computers are classified into the following types:

Supercomputer: Supercomputers are the fastest and the most expensive type of computer. They are large and require more space for installation. These types of computers are mainly designed to perform massive data-based and complex tasks. Supercomputers are capable enough to handle trillions of instructions at the same time.

Mainframe Computer: Mainframe computers are comparatively smaller in size as compared to supercomputers. However, they are not much small. These types of computers are designed to perform hundreds or thousands of jobs at a time simultaneously. These computers can handle heavy tasks, including complex calculations and can store vast amounts of data. They are best suited for big organizations such as banking, telecom, and educational sectors.

Microcomputer: Microcomputers are cheap in price and support multi-user platform. These are the general-purpose computers designed to handle all the necessary tasks of individual needs. Since they are comparatively slower than mainframe computers, thereby are suitable for small organizations. They are best suited for internet café, schools, universities, offices, etc. A microcomputer is also referred to as the 'Personal Computer (PC)' in general life. Laptop and desktop are examples of microcomputers.

Minicomputer: Minicomputers are also referred to as Miniframe computers. These are the midsize multiprocessing computer designed purposely for easy carry. These types of computers are light-weight and can fit in a small space. They are suitable for billing, accounting, education, and business purposes. Since these minicomputers are easy to carry, they are the best option for those who need a computer while traveling. Tablet PC, Notebooks, and cell phones are examples of minicomputers.

Workstation: Workstation is a powerful, single-user computer. A workstation is a personal computer with a faster microprocessor, a massive amount of RAM, higher-quality monitors, high graphic memory, etc. This is best suited for performing any specific type of task professionally. According to the type of tasks, a workstation can be referred to as a music workstation, graphic workstation, or engineering design workstation. Most businesses and professionals use workstations for performing tasks like animation, music creation, video editing, poster designs, data analysis and more.

Advantages of Using Computer

The following are the main advantages of using the computer:

- Computers can perform given tasks at incredible speed.
- Computers can perform the same task multiple times with the same accuracy.
- Computers allow doing several tasks simultaneously as they are best suited for multitasking.
- Computers keep the stored data secure and inaccessible from unauthorized users.
- Computers can automatically perform routine tasks with automation, making humans available for more intelligent tasks.

Disadvantages of Using Computer

The following are the main disadvantages of using the computer:

- Computers cannot work on their own. They need instructions from humans to complete tasks. Moreover, computers follow the given instructions blindly without thinking about the outcomes.
- Computers need a power supply to work. Without a power supply, they are just useless.
- Working on a computer continuously for a long period can cause several health issues.
- Wastage of computers and their parts leave a negative impact on the environment.

- Computers are taking human jobs in many sectors. They are replacing human work and thus increasing unemployment.





Hands on Practice:



Certificate:



**PINGLE GOVERNAMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
WADEPPALLY, HANUMAKONDA**

DEPARTMENT OF COMPUTER SCIENCE & APPLICATION

CERTIFICATE

This is to certify that Mr/Ms _____ of **PINGLE GOVERNAMENT COLLEGE FOR WOMEN(A), HANUMAKONDA** has successfully attended Bridge Course on **“INTRODUCTION TO COMPUTER”** Organized by Department of Computer Science and Application Conducted on 14th DECEMBER 2022

T.Aruna
CONVENER

Prof. B. Chandra Mouli
PRINCIPAL

ABOUT THE WORKSHOP

"Introduction to Python" workshop will be held at Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda, on 07th February, 2023. The Aim of the workshop is to provide fundamental knowledge about Programming language and Python Programming .The faculty and students of department of computers attend the workshop.

Python Introduction

Python Introduction
Python features
Python Applications
Getting started in python
Programming in immediate mode
Programming in script mode
input statements
output statements



Introduction to Python Programming

1. Comments
2. Arithmetic Operators
3. Variables
4. Data Type
5. Input/Output
6. Boolean Operators
7. Lists
8. Tuples
9. Strings
10. Manipulating Strings
11. Flow control: For Loops and While Loops
12. Dictionaries and Structuring Data
13. Exceptions
14. Functions
15. Namespace
16. Read and Write Files
17. Sets
18. Introduction to IoT using Python and Cisco Packet Tracer

Prof. B. ChandraMouli , Principal

ORGANIZING COMMITTEE:

Conveners : B. Swarnalatha
: P. Prathibha
: T. Aruna

MEMBERS : P. Bharathi

Seminar hall (Room. No: 47)

ABOUT THE COLLEGE



Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda has an illustrious and developmental history. It started with pre-university courses in Arts, Commerce and Science in the building donated by Pingle family in 1965. Since then It witnessed continuous and consistent development in expanding the courses, At present college is providing 17 U.G. and 10 P.G. courses and Certificate courses and one Add on Course, sponsored by UGC in Diploma in Front Office Management

Pingle Govt. College for Women(Autonomous), Waddepally, Hanumakonda has introduced the computer courses in the year 1998 with B.Sc Mathematics, Physics and Computer science combination. In the immediate successive year, i.e, (1998 - 1999) Computer course with B.A and B.Com classes also were introduced. Since then there has been a study and evident development of the department. Currently the courses are B.Sc (Phy. Sci.) as MPCS, MCCS, MSCS, B.Com (CA), and BSC (Life Sci. with CS) & with new courses B.Sc Data Science

BRIDGE COURSE

ON
INTRODUCTION TO PYTHON
PROGRAMMING LANGUAGE
07TH FEBRUARY, 2023
TO
05TH MARCH , 2023



Organized by

**DEPARTMENT OF COMPUTER
SCIENCE & APPLICATIONS**

**PINGLE GOVERNMENT COLLEGE FOR
WOMEN(AUTONOMOUS)
WADDEPALLY, HANAMKONDA
(Accredited with 'A' Grade by NAAC)**

COURSES OFFERED

Under Graduation

- B.Sc.(Maths, Physics, Computer Science)
- B.Sc.(Maths, Statistics Computer Science)
- B.Sc.(Maths, Statistics ,Data Science)
- B.Sc.(Maths, Chemistry, Computer Science)
- B.Sc.(Botany, Zoology, Computer Science)
- B.Sc.(Microbiology, Zoology, Computer Science)
- B.Com.(Computer Applications)

HIGHLIGHTS OF DEPARTMENT

ABOUT THE COLLEGE:

- Outcome Based Education
- Focus on programming hands-on
- Online Teaching Assistance through Video Lectures
- Motivation for Self learning initiatives
- Well defined student Counseling and Mentoring process
- Maintaining e-Library using QR CODES
- Well defined Teaching-Learning Process with use of Technology Based Teaching Methodologies
- Value added course such as IOT, BIGDATA, CLOUD COMPUTING, PYTHON are regularly offered to students with Online Platforms Spoken Tutorial, Coursera , Edx etc

COLLEGE WEBSITE:

<https://gdcts.cgg.gov.in/hanamkondawomen.edu>



Fundamentals of Python

Conditional Statements/ Decision Making Statements

- In Python, the selection statements are also known as Decision control statements or branching statements.
- The selection statement allows a program to test several conditions and execute instructions based on which condition is true.
- Conditional statements are handled by IF statements in Python.

Some Decision Control Statements are:

- Simple if
- if-else
- nested if
- if-elif-else

Statement & Description	
	<u>if statements:</u> An if statement consists of a boolean expression followed by one or more statements.
	<u>if...else statements:</u> An if statement can be followed by an optional else statement , which executes when the boolean expression is FALSE.
	<u>nested if statements:</u> You can use one if or else if statement inside another if or else if statement(s).

If Statement (Simple if):

- *If statements* are control flow statements that help us to run a particular code, but only when a certain condition is met or satisfied.
- A *simple if* only has one condition to check.
- Python if Statement is used for decision-making operations.
- It contains a body of code which runs only when the condition given in the if statement is true.

```
n = 10
if n % 2 == 0:
    print("n is an even
    number")
```

Syntax:

```
if
  expressio
  n
  Statement
```

Example:

```
n = 5
if n % 2 == 0:
    print("n is
    even")

else:

    print("n is odd")
```

if-else statement: The *if-else* *statement* evaluates the condition and will execute the body of **if** if the test condition is True, but if the condition is False, then the body of **else** is executed.

- An else statement can be combined with an if statement.
- The else statement is an optional statement and there could be at most only one else statement following if.

Syntax

```
if
  expression:
  statement(s
  )      else:
  statement(s
  )
```


nested if: *Nested if statements* are an if statement inside another if statement.

if-elif-else statement: The *if-elif-else statement* is used to conditionally execute a statement or a block of statements.

- The elif statement allows you to check multiple expressions for TRUE and execute a block of code as soon as one of the conditions evaluates to TRUE.
- Similar to the else, the elif statement is optional.
-

```
x = 15
y = 12
if x == y:
    print("Both are
Equal") elif x > y:
    print("x is greater
than y")
```

However, unlike else, for which there can be at most one statement, there can be an arbitrary number of elif statements following an if.

Syntax

```
if expression1:
    statement(s)
elif expression2:
    statement(s)
elif expression3:
    statement(
s) else:
    statement(s)
```

Repetition Two (Loop) statements

- A **repetition statement** is used to repeat a group(block) of programming instructions.
- A loop statement allows us to execute a statement or group of statements multiple times.
- In Python, we generally have **loops/repetitive statements:**
 - for loop

● while loop

	Loop Type & Description
	<p><u>while loop</u></p> <p>Repeats a statement or group of statements while a given condition is TRUE. It tests the condition before executing the loop body.</p>
	<p><u>for loop</u></p> <p>Executes a sequence of statements multiple times and abbreviates the code that manages the loop variable.</p>

While Loop:

- A while loop statement repeatedly executes a target statement as long as a given condition is true.

Syntax

```
while  
    expression:  
    statement(  
    s)
```

- Here, statement(s) may be a single statement or a block of statements.
- The condition may be any expression, and true is any non-zero value. The loop iterates while the condition is true.
- When the condition becomes false, program control passes to the line immediately following the loop.

Example

```
count = 0
```

```
while (count < 9):
```

```
    print 'The count is:',  
    count  
    count = count + 1
```

for loop: A *for loop* is used to iterate over a sequence that is either a list, tuple, dictionary, or a set.

We can execute a set of statements once for each item in a list, tuple, or dictionary.

Syntax

for iterating_var in sequence:

statements(s)

•

```
lst = [1, 2, 3, 4, 5]
for i in range(len(lst)):
    print(lst[i], end = " ")
for j in range(0,10):
    print(j, end = " ")
```

If a sequence contains an expression list, it is evaluated first.

- Then, the first item in the sequence is assigned to the iterating variable *iterating_var*.
- Next, the statements block is executed.
- Each item in the list is assigned to *iterating_var*, and the statement(s) block is executed until the entire sequence is exhausted.

Example: for letter in
 'Python':
print 'Current Letter :', letter

Python Lists

Lists are used to store multiple items in a single variable.

Lists are one of 4 built-in data types in Python used to store collections of data, the other 3 are [Tuple](#), [Set](#), and [Dictionary](#), all with different qualities and usage.

Lists are created using square brackets:

```
Example: thislist = ["apple",
                    "banana", "cherry"]
print(thislist)
```

List Items: List items are ordered, changeable, and allow duplicate values.

List items are indexed, the first item has index [0], the second item has index [1] etc.

Ordered: When we say that lists are ordered, it means that the items have a defined order, and that order will not change.

If you add new items to a list, the new items will be placed at the end of the list.

Changeable: The list is changeable, meaning that we can change, add, and remove items in a list after it has been created.

Allow Duplicates: Since lists are indexed, lists can have items with the same value:

```
Example: thislist = ["apple", "banana", "cherry", "apple",  
"cherry"] print(thislist)
```

List Length: To determine how many items a list has, use the **len()** function:

```
thislist = ["apple", "banana",  
"cherry"] print(len(thislist))
```

List Items - Data Types: List items can be of any data

```
type: list1 = ["apple", "banana",  
"cherry"] list2 = [1, 5, 7, 9,  
3] list3 = [True, False,  
False]
```

- A list can contain different data types:

- list1 = ["abc", 34, True, 40, "male"]

type(): lists are defined as objects with the data type 'list': <class 'list'>

Example

```
mylist = ["apple", "banana",  
"cherry"] print(type(mylist))
```

The list() Constructor: It is also possible to use the **list()** constructor when creating a new list. `thislist = list(("apple", "banana", "cherry"))`

```
print(thislist)
```

Python Tuple

Python Tuple is used to store the sequence of immutable Python objects. The tuple is similar to lists since the value of the items stored in the list can be changed, whereas the tuple is immutable, and the value of the items stored in the tuple cannot be changed.

Creating a tuple

A tuple can be written as the collection of comma-separated (,) values enclosed with the small () brackets. The parentheses are optional but it is good practice to use. A tuple can be defined as follows.

```
T1 = (101, "Peter", 22)
```

```
T2 = ("Apple", "Banana", "Orange")
```

```
T3 = 10,20,30,40,50
```

```
print(type(T1))
```

```
print(type(T2))
```

```
print(type(T3))
```

Basic Tuple operations

The operators like concatenation (+), repetition (*), Membership (in) works in the same way as they work with the list.

Let's say Tuple t = (1, 2, 3, 4, 5) and Tuple t1 = (6, 7, 8, 9) are declared.

Operator	Description	Example
Repetition	The repetition operator enables the tuple elements to be repeated multiple times.	T1*2 = (1, 2, 3, 4, 5, 1, 2, 3, 4, 5)
Concatenation	It concatenates the tuple mentioned on either side of the operator.	T1+T2 = (1, 2, 3, 4, 5, 6, 7, 8, 9)
Membership	It returns true if a particular item exists in the tuple otherwise false	print (2 in T1) prints True.
Iteration	The for loop is used to iterate over the tuple elements.	for i in T1:print(i) Output 1 2 3 4

		5
Length	It is used to get the length of the tuple.	len(T1) = 5

Python Tuple inbuilt functions:

SN	Function	Description
	cmp(tuple 1, tuple2)	It compares two tuples and returns true if tuple1 is greater than tuple2 otherwise false.
	len(tuple)	It calculates the length of the tuple.
	max(tuple)	It returns the maximum element of the tuple
	min(tuple)	It returns the minimum element of the tuple.
	tuple(seq)	It converts the specified sequence to the tuple.

Dictionaries

- Dictionaries are used to store data values in key: value pairs.
- A dictionary is a collection which is ordered*, changeable and do not allow duplicates.
-

In Python dictionaries are written with curly brackets, and they have keys and values. Key-value pairs

Unordered

We can construct or create dictionary like:

X={1:'A',2:'B',3:'c'}

X=dict([('a',3) ('b',4)])

X=dict('A'=1,'B' =2)

Example:

```
>>> dict1 = {"brand": "mrcet", "model": "college", "year": 2004}
```

```
>>> dict1
```

```
{'brand': 'mrcet', 'model': 'college', 'year': 2004}
```

- Dictionary items are ordered, changeable, and does not allow duplicates.
- Dictionary items are presented in key: value pairs, and can be referred to by using the key name.
- When we say that dictionaries are ordered, it means that the items have a defined order, and that order will not change.
- Unordered means that the items does not have a defined order, you cannot refer to an item by using an index.
- Dictionaries are changeable, meaning that we can change, add or remove items after the dictionary has been created.
- Dictionaries cannot have two items with the same key

Example: thisdict = {

```
    "brand": "Ford",
```

```
    "model": "Mustang",
```

```
    "year": 1964,
```

```
    "year": 2020
```

```
}
```

```
print(thisdict)
```

Methods: Methods that are available with dictionary are tabulated below.

Method	Description
<code>clear()</code>	Remove all items form the dictionary.
<code>copy()</code>	Return a shallow copy of the dictionary.
<code>get(key[,d])</code>	Return the value of key. If key does not exit, return d
<code>items()</code>	Return a new view of the dictionary's items (key, value).

<code>keys()</code>	Return a new view of the dictionary's keys.
<code>pop(key[,d])</code>	Remove the item with key and return its value or d if key is not found. If d is not provided and key is not found, raises KeyError.
<code>popitem()</code>	Remove and return an arbitrary item (key, value).
<code>setdefault(key[,d])</code>	If key is in the dictionary, return its value. If not, insert key with a value of d and return d (defaults to None).
<code>update([other])</code>	Update the dictionary with the key/value pairs from other, overwriting existing keys.
<code>values()</code>	Return a new view of the dictionary's values

Operations :

- Add/change
- Remove
- Length
- Delete

Add/change values: You can change the value of a specific item by referring to its key name

```
>>> dict1 = {"brand": "mrcet", "model": "college", "year": 2004}
>>> dict1["year"] = 2005
>>> dict1
{'brand': 'mrcet', 'model': 'college', 'year': 2005}
```

Remove(): It removes or pop the specific item of dictionary.

```
>>> dict1 = {"brand": "mrcet", "model": "college", "year": 2004}
>>> print(dict1.pop("model")) college
>>> dict1
{'brand': 'mrcet', 'year': 2005} Delete: Deletes a
```


particular item.

```
>>> x = {1:1, 2:4, 3:9, 4:16, 5:25}
```

```
>>> del x[5]
```

```
>>> x
```

Length: we use len() method to get the length of dictionary.

```
>>>{1: 1, 2: 4, 3: 9, 4: 16}
```

```
{1: 1, 2: 4, 3: 9, 4: 16}
```

```
>>> y=len(x)
```

```
>>> y 4
```

Python Functions

- A function is a block of code which only runs when it is called.
 - You can pass data, known as parameters, into a function.
 - A function can return data as a result.
- In Python a function is defined using the **def** keyword:

Example: `def my_function():`

```
    print("Hello from a function")
```

- To call a function, use the function name followed by parenthesis:
 - Example: `my_function()`
- Information can be passed into functions as arguments.
- Arguments are specified after the function name, inside the parentheses.

Example: `def my_function(fname):`
 `print(fname + " Refsnes")`

```
my_function("Rama")  
my_function("Sony")  
my_function("Krishna")
```

Defining a Function

Syntax:

```
def functionname( parameters ):
```

```
    "function_docstring"  
    function_suite  
    return [expression]
```

- To let a function return a value, use the return statement:

Example

```
def my_function(x):
```

```

return 5 * x
print(my_function(
3))
print(my_function(
5))
print(my_function(
9))

```

- You can delete a function with the 'del' keyword. Example: del my_function

Calling a Function

- Once the basic structure of a function is finalized, you can execute it by calling it from another function or directly from the Python prompt.

- Example printme()

```

def printme( str ):
    "This prints a passed string into this
function" print str
    return;
printme("I'm first call to user defined
function!") printme("Again second call to the
same function")

```

Pass by reference vs value

- All parameters (arguments) in the Python language are passed by reference.
- It means if you change what a parameter refers to within a function, the change also reflects back in the calling function.
- For example –

```

def changeme( mylist ):

    "This changes a passed list into this
function" mylist.append([1,2,3,4]);
    print "Values inside the function: ", mylist
    return changeme( mylist );

print "Values outside the function: ", mylist

```

Output:

Values inside the function: [10, 20, 30, [1, 2, 3, 4]]

Values outside the function: [10, 20, 30, [1, 2, 3, 4]]

- There is one more example where argument is being passed by reference and the reference is being overwritten inside the called function.

```

def changeme( mylist ):

    "This changes a passed list into this
function" mylist = [1,2,3,4];
    print "Values inside the function: ",

```

```

mylist return

changeme( mylist );

print "Values outside the function: ", mylist

```

Python Strings

- Strings in python are surrounded by either single quotation marks, or double quotation marks. 'hello' is the same as "hello".
 - You can display a string literal with the print() function:
Example: print("Hello")
- Python does not support a character type; these are treated as strings of length one, thus also considered a substring.
- To access substrings, use the square brackets for slicing along with the index or indices to obtain your substring.

● For example –

```

var1 = 'Hello World!'
var2 = "Python
Programming"
print
"var1[0]: ", var1[0]
print "var2[1:5]: ", var2[1:5]

```

- Python Strings can join using the concatenation operator +.

```

>>> a=' Hello! '
>>> b='How are you?'
>>> a+b

```

Output: 'Hello! How are you?'

String Methods: Python has a set of built-in methods that you can use on strings.

Method	Description
capitalize()	Converts the first character to uppercase
casefold()	Converts string into lower case
center()	Returns a centered string
count()	Returns the number of times a specified value occurs in a string
find()	Searches the string for a specified value and returns the position of where it was found
format()	Formats specified values in a string
isalnum()	Returns True if all characters in the string are alphanumeric

isalpha()	Returns True if all characters in the string are in the alphabet
isdigit()	Returns True if all characters in the string are digits
isidentifier()	Returns True if the string is an identifier
islower()	Returns True if all characters in the string are lower case
isnumeric()	Returns True if all characters in the string are numeric
isprintable()	Returns True if all characters in the string are printable
isspace()	Returns True if all characters in the string are whitespaces
istitle()	Returns True if the string follows the rules of a title
isupper()	Returns True if all characters in the string are upper case
lower()	Converts a string into lower case
lstrip()	Returns a left trim version of the string
maketrans()	Returns a translation table to be used in translations
partition()	Returns a tuple where the string is parsed into three parts
replace()	Returns a string where a specified value is replaced with a specified value
split()	Splits the string at the specified separator, and returns a list

title()	Converts the first character of each word to uppercase
translate()	Returns a translated string
upper()	Converts a string into upper case

Exceptions Handling

- Python has many **built-in exceptions** that force your program to output an error when something goes wrong.
- When these exceptions occur, it causes the current process to stop and passes it to the calling process until they are handled. If not handled, our program will crash.

For example, if **function** A calls function B which in turn calls function C, an exception occurs in function C. If it is not handled in C, the exception passes to B and then to A.

- If never handled, an error message is spit out and our program comes to a sudden, unexpected halt.

- The try...except block is used to handle exceptions in Python.

Syntax:

try...except block:

try:

code that may cause an exception except:

code to run when an exception occurs

- Every **try** block is followed by an **except** block.
- When an exception occurs, it is caught by the **except** block.
- The **except** block cannot be used without the try block.

Catching exceptions in Python

- In Python, exceptions can be handled using a try statement.
- A critical operation that can raise an exception is placed inside the try clause and the code that handles the exception is written in except clause.
- It is up to us, what operations we perform once we have caught the exception.

```
import sys
```

```
randomList = ['a', 0, 2] for entry in randomList:
```

```
try:
```

```
print("The entry is", entry)r = 1/int(entry) break
```

```
except:
```

```
print("Oops!",sys.exc_info()[0],"occured.")print("Next entry.") print()
```

```
print("The reciprocal of",entry,"is",r)
```

Output

The entry is a

Oops! <class 'ValueError'> occured. Next entry.

The entry is 0

Oops! <class 'ZeroDivisionError' > occured.Next entry. The entry is 2

with a file, or working with a graphic user interface (GUI).

- In all these circumstances, we must clean up the resource once it has been used, whether it was successful or not.
- These actions (closing a file, closing the GUI, or disconnecting from the network) are performed in the finally clause to guarantee execution.

try:

```
f = open("test.txt",encoding =  
'utf-8') # perform file operations  
finally: f.close()
```

Different types of exceptions in Python:

In Python, there are several built-in exceptions that can be raised when an error occurs during the execution of a program.

Some of the most common types of exceptions in Python are:

1. **SyntaxError:** This exception is raised when the interpreter encounters a syntax error in the code, such as a misspelled keyword, a missing colon, or an unbalanced parenthesis.
 2. **TypeError:** This exception is raised when an operation or function is applied to an object of the wrong type, such as adding a string to an integer.
 3. **NameError:** This exception is raised when a variable or function name is not found in the current scope.
 4. **IndexError:** This exception is raised when an index is out of range for a list, tuple, or other sequence types.
 5. **KeyError:** This exception is raised when a key is not found in a dictionary.
 6. **ValueError:** This exception is raised when a function or method is called with an invalid argument or input, such as trying to convert a string to an integer when the string does not represent a valid integer.
 7. **AttributeError:** This exception is raised when an attribute or method is not found on an object, such as trying to access a non-existent attribute of a class instance.
 8. **IOError:** This exception is raised when an I/O operation, such as reading or writing a file, fails due to an input/output error.
 9. **ZeroDivisionError:** This exception is raised when an attempt is made to divide a number by zero.
- ImportError:** This exception is raise





Hands on Practice:





Students Participated List:

S.No	HT NO.	NAME OF THE CANDIDATE
1	OO5201302	AVULA DIVYA
2	OO5201306	CHIDEM RAJINI
3	OO5201308	KOMMANABOINA HARITHA
4	OO5201310	MATHANGI DEEPIKA
5	OO5201311	MEERPELLI BINDU PRASANNA
6	OO5201312	MOHAMMAD SANAAFRIN
7	OO5201313	MUNDRATHI LAVANYA
8	OO5201314	PUJARI SATHWIKA
9	OO5201315	PULLURU RISHIKA
10	OO5201316	SAMREEN BEGUM

11	005201318	SINGARAPU USHAKIRAN
12	005201319	SIRIGADHI KASTURI
13	005201751	BANOTHU ANUSHA
14	005201753	CHILUVERU PRATHIMA
15	005201754	GANDHAM PUSHPALATHA
16	005201756	KANGALA RAJESWARI
17	005201757	KONKATI AKHILA
18	005201758	LOKINI RAVALIKA
19	005201701	ARURI MAHESHWARI
20	005201702	ATLA GOUTHAMI
21	005201705	GOURISETTY AMULYA
22	005201706	ILAPURAM MANASA
23	005201707	ILAPURAM SOUMYA
24	005201709	KANDUKURI PRASUNA
25	005201710	MACHARLA SRIVANI
26	005201711	MADAPA ANUSHA
27	005201712	NALLATEEGALA SAMATHA
28	005201713	NALLATHEEGALA SUMALATHA
29	005201715	SIRIKONDA RAVEENA
30	005201501	BHUKYA SWETHA

Certificate:



**PINGLE GOVERNAMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
WADEPPALLY, HANUMAKONDA**

DEPARTMENT OF COMPUTER SCIENCE & APPLICATION

CERTIFICATE

This is to certify that Mr/Ms _____ of **PINGLE GOVERNAMENT COLLEGE FOR WOMEN(A),HANUMAKONDA** has successfully attended Bridge Course on "**BASIC COMPUTER SKILL**" Organized by Department of Computer Science and Application Conducted on 15th NOVEMBER 2022

T.Aruna
CONVENER

Prof. B. Chandra Mouli
PRINCIPAL

ABOUT THE WORKSHOP

“Basics of Computer and Power Point” workshop will be held at Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda, on 02ND March, 2023. The Aim of the workshop is to provide fundamental knowledge about PowerPoint Basics, Insert Image, Insert Video. The faculty and students of department of computers attend the workshop.

The PowerPoint Toolbar



- **File**
 - Info—New—Open—Save—Save As—Print—Share—Export—Close
- **Home**
 - Clipboard—Slides—Font—Paragraph—Drawing—Editing
- **Insert**
 - Slides—Tables—Images—Illustrations—Add-ins—Links—Comments—Text—Symbols—Media
- **Design**
 - Themes—Variants—Customize (Slide Size, Format Background)
- **Transitions**
 - None—Cut—Fade—Push—Wipe—Split—Reveal—Random Bars—Shape—Uncover—Cover—Flash—Fall Over—Drape—Curtains—Wind—Presige—(Plus More)—Timing

The PowerPoint Toolbar



- **Animations**
 - Appear—Fade—Fly In—Float In—Split—Wipe—Shape—Wheel—Random Bars—Grow & Turn—Zoom—Bounce—Pulse—(plus more)—Advanced Animation—Timing
- **Slide Show**
 - Start Slide Show—Set Up—Monitors
- **Review**
 - Proofing—Insights—Comments—Compare—Start Inking Ink
- **View**
 - Presentation Views—Master Views—Show—Zoom—Color/Grayscale—Window—Macros
- **Format**
 - Insert Shapes—Shape Styles—WordArt Styles—Arrange—Size

Prof. B. Raja Reddy, Principal

ORGANIZING COMMITTEE:

**Conveners :B. Swarnalatha
:P. Prathibha
:T. Aruna**

Seminar hall (Room. No: 47)

ABOUT THE COLLEGE:



Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda has an illustrious and developmental history. It started with pre-university courses in Arts, Commerce and Science in the building donated by Pingle family in 1965. Since then it witnessed continuous and consistent development in expanding the courses. At present college is providing 17 U.G. and 10 P.G. courses and Certificate courses and one Add on Course, sponsored by UGC in Diploma in Front Office Management

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**BRIDGE COURSE
ON
BASICS OF COMPUTER AND POWER
POINT
02nd MARCH , 2021.
TO
20th MARCH ,2021**



Organized by

**DEPARTMENT OF
COMPUTER
SCIENCE &
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- B.Sc.(Botany, Zoology, Computer Science)
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HIGHLIGHTS OF DEPARTMENT

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- Value added course such as IOT, BIGDATA, CLOUD COMPUTING, PYTHON are regularly offered to students with Online Platforms Spoken Tutorial, Coursera , Edx etc

COLLEGE WEBSITE:

<https://gdcts.cgg.gov.in/hanamkondawomen.edu>



Introduction to Computers:-

Fundamentals of Information Technology (FIT): - The information technology, which is exclusively designed to store, process and transmit information, is known as Fundamentals of Information Technology.

Computer: - Computer is a an Electronic device. Which accepts the *data*, it Process and storage. It gives the

Information (results). (or)

Computer is a Group of an electronic devices. Which accepts the *data*, it Process and storage. It

gives the *Information*.

*Charles Babbage is called the "Father of the computer". The First mechanical computer designed by Charles Babbage was called **Analytical Engine**. It uses read-only memory in the form of punch cards.

Data: - Data is a collection of rawfacts. Which does not have perfect meaning is called as a data. It refers such as numbers, Characters, Symbols, images, videos, Audios,.... etc.

Process: - Process is the manipulation of data. It includes.

- 1) Calculations
- 2) Comparison
- 3) Logical Operations
- 4) Decision making

Information: - Information is the processed data. Which will have perfect meaning is called as Information. It refers such as numbers, Characters, Symbols, images, videos etc...

Ex:- H.T. No : YOMC1501
Student Name : K.L.N.RAO
Course : M.B.A Information
Age : 25
Duration: 02

CHARACTERISTICS OF COMPUTER:

The characteristics of computers that have made them so powerful and universally useful, although the computers are of various types depending on their size and capacity but all the computers have some common characteristics. As all knows that a computer has a lot of features or characteristics but in all those characteristics 5 are the most popular. Therefore the five Major characteristics of computers are given below:

- 1) Speed
- 2) Accuracy
- 3) Storage Capacity
- 4) Diligence
- 5) Versatility

1) Speed: -

Computer is a fast calculating device. The speed of computer is a managerial million instruction per second. we determine the speed of computer in terms of microsecond (10⁻⁶ part of a second) or nanosecond (10 to the power -9 part of a second). The computer works with the speed of....

1 milli second = 10⁻³ sec

1 micro second = 10⁻⁶ sec

1 nano second = 10⁻⁹ sec

1 Pico second = 10⁻¹² sec

2) Accuracy: -

The degree of accuracy of computer is very high and every calculation is performed with the same accuracy. The accuracy level is 7 determined on the basis of design of computer. The errors in computer are due to human and inaccurate data. The computer gives 100% accurate results. It gives wrong results only when the data is wrongly entered and when the software is corrupted. Otherwise computer gives 100% accurate results.

3) Storage Capacity: -

Storage is one of the main aim of the computer, because it stores. The computer stores data in binary digits in binary system there are only 2 digits, there are 0's and 1's. 'Bi' means two numbers in Latin language. There are 0 and 1.

1 nibble = 4 bits

8 bits = 1 byte

1024 Bytes = 1 Kilo

Byte 1024 KB = 1Mega

Byte 1024 MB = 1Giga

Byte 1024 GB = 1Tera

Byte 1024 TB = 1Peta

Byte 1024 PB = 1Exa

Byte

4) Diligence: -

A computer is free from tiredness, lack of concentration, fatigue, etc. It can work for hours without creating any error. If millions of calculations are to be performed, a computer will perform every calculation with the same accuracy. Due to this capability it overpowers human being in routine type of work. If we make the computer to work for 24 hours for a day, it works with the same speed and gives 100% accurate result.

5) Versatility: -

The computer never gets confused. It performs multitasking jobs at a time with the same Speed and gives 100% accurate result. It means the capacity to perform completely different type of work. We can use computer to prepare payroll slips. Next moment you may use it for inventory management or to prepare electric bills.

Evolution of Computer:-

The evolution of digital computing is often divided into generations. Each generation is characterized by dramatic improvements over the previous generation in the technology used to build computers, the internal organization of computer systems and programming languages.

****Block Diagram of Computer:**

Input Unit:-

The data given to the system (or) Fed the data into the computer system CPU (Central Processing System) is called as a computer input.

Central Processing System (CPU):-

CPU is also called as heart of the computer, all major calculations; comparisons are made inside the CPU. CPU is divided into 3 units.

- 1) Arithmetic Logic Unit
- 2) Control Unit
- 3) Memory Unit

1) Arithmetic Logic Unit: -

Arithmetic Logic Unit performs all the arithmetic, relational and logical calculations.

- The arithmetic operations are + , - , * , %
- The relational operations are > , < , <= , > = , ==
- Logical operations are AND ,OR , NOT

2) Control Unit: -

Control unit controls whole the computer. It takes the data and instructions from the memory unit and understands the instructions & sends the data to different parts of the computer for processing it takes the information stores in the memory unit and sends it to the required output device. The data is transferred from one place to another place with the help of 'BUS'.

3) Memory Unit: -

The data and instructions given to the computer should be stored in some storage place, that storage place is called as memory unit. Memory unit has two types.

- i) Primary memory
- ii) Secondary memory

Output Unit: -

The information taken from the CPU is called as an output. An output device is any hardware device used to send data from a computer to another device or user, it is processed data.

PowerPoint

Microsoft PowerPoint is essentially a graphics presentation software application that comes in the same package of software as **MS Access, MS Excel, MS Word, and MS Paint, issued by Microsoft Office**. It is a software that helps the user in formulating and arranging their data and information in the form of slides, which enhances the clarity and communication of the subject, along with adding a visual aspect to the data which makes it more appealing and presentable.

Thus, it can be used for presenting business ideas and plans, and visually presenting the data also makes learning with the data a lot easier, thus can be used by teachers in schools for making learning fun and uncomplicated.

Meaning of PowerPoint

PowerPoint is a software that is designed to **make graphical presentations** in the form of individual pages also known as slides.

Features of PowerPoint

Some of the **features available in Microsoft PowerPoint** are stated below.

- Customising Colour Schemes
- Adding Animations
- Creating and Adding tables
- Adding images
- Adding and Managing Hyperlinks
- Creating Custom Shows
- Creating and Importing Charts
- Easy exporting to MS Word

How to Start PowerPoint?

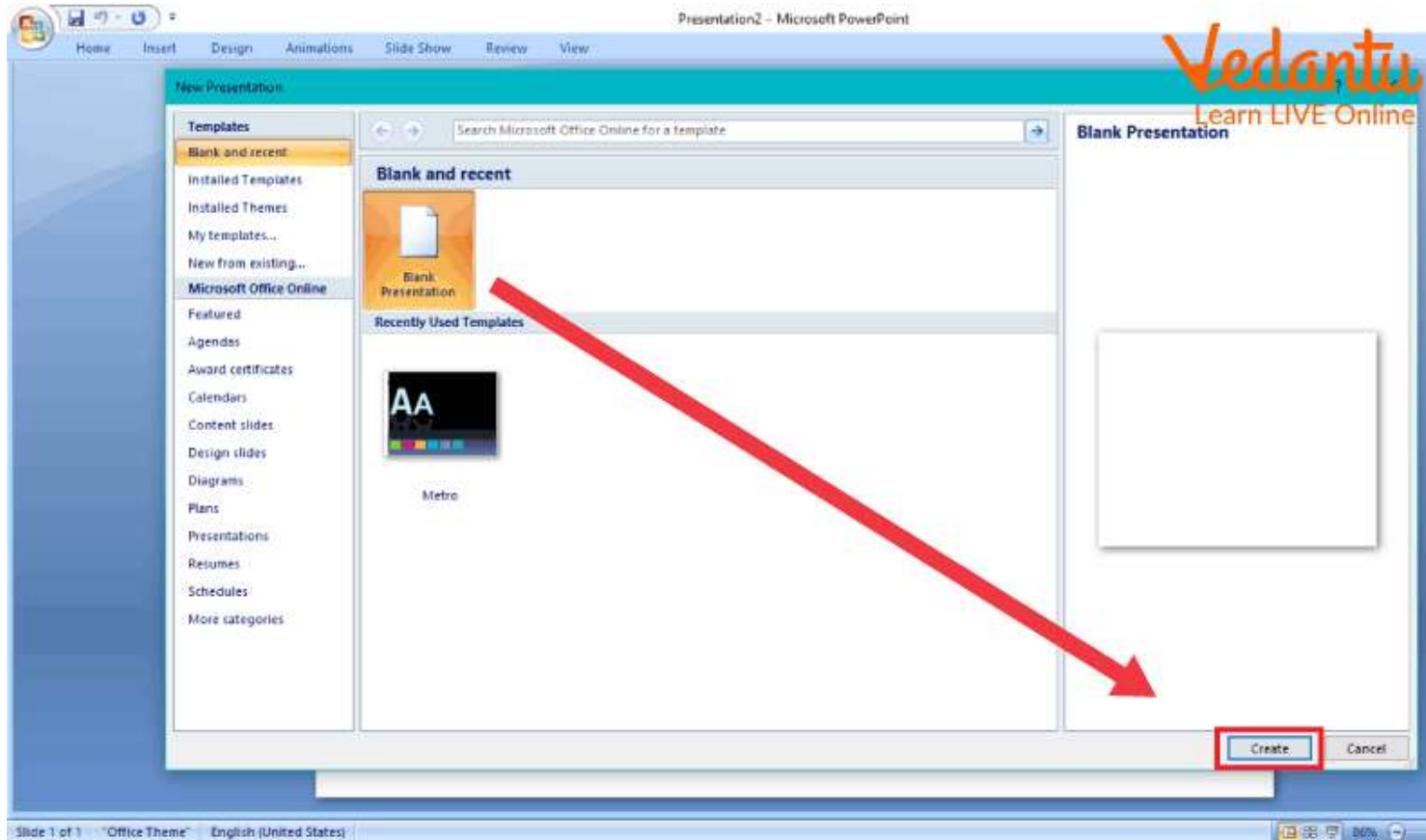
To Start PowerPoint:

- Click on Start
- Click the following in sequence stated: All Programs->Microsoft Office->Microsoft Office PowerPoint
- The Microsoft Office PowerPoint window will appear, starting the software.

How to Open a Blank Presentation?

By default, when we open PowerPoint for the first time, it opens to a new presentation but for future purposes, if we want to open a new presentation, we can do so by following the below-given steps.

- Click on New Presentation link on Getting Started pane on the left which results in the appearance of a new window.
- Select on Blank Presentation, when the new presentation appears along with it a Layout pane on the right will also appear.
- Select any desired layout from the list.



Opening a New Presentation

Uses of PowerPoint

- **Uses of PowerPoint in Education:**
Since PowerPoint offers the feature of adding images and animations, learning by visualisation makes the learning experience more fun and simplified, and researchers state that visual information is retained for a longer amount of time thus it makes the whole process more beneficial.
- **Uses of PowerPoint in Business:**
Business is mainly about creating a well-laid out roadmap and planning for the project at hand and then executing it. With PowerPoint we can assure a more organised output with a solid structure.
- **Uses of PowerPoint for Government and Citizen Services:**
PowerPoint is also a good option, from other software bundled within MS Office, for storing records and since it's also printable, it provides easy access to the records for government and citizen services to the seekers.

Summary

MS Office PowerPoint is an application for making graphical presentations thus adding a visual aspect to our data, enhancing its concept, and leading to easier communication. The software offers various features like Customising colour schemes, adding graphics, images, and animation, etc. Thus it serves as a salient software under MS Offices.

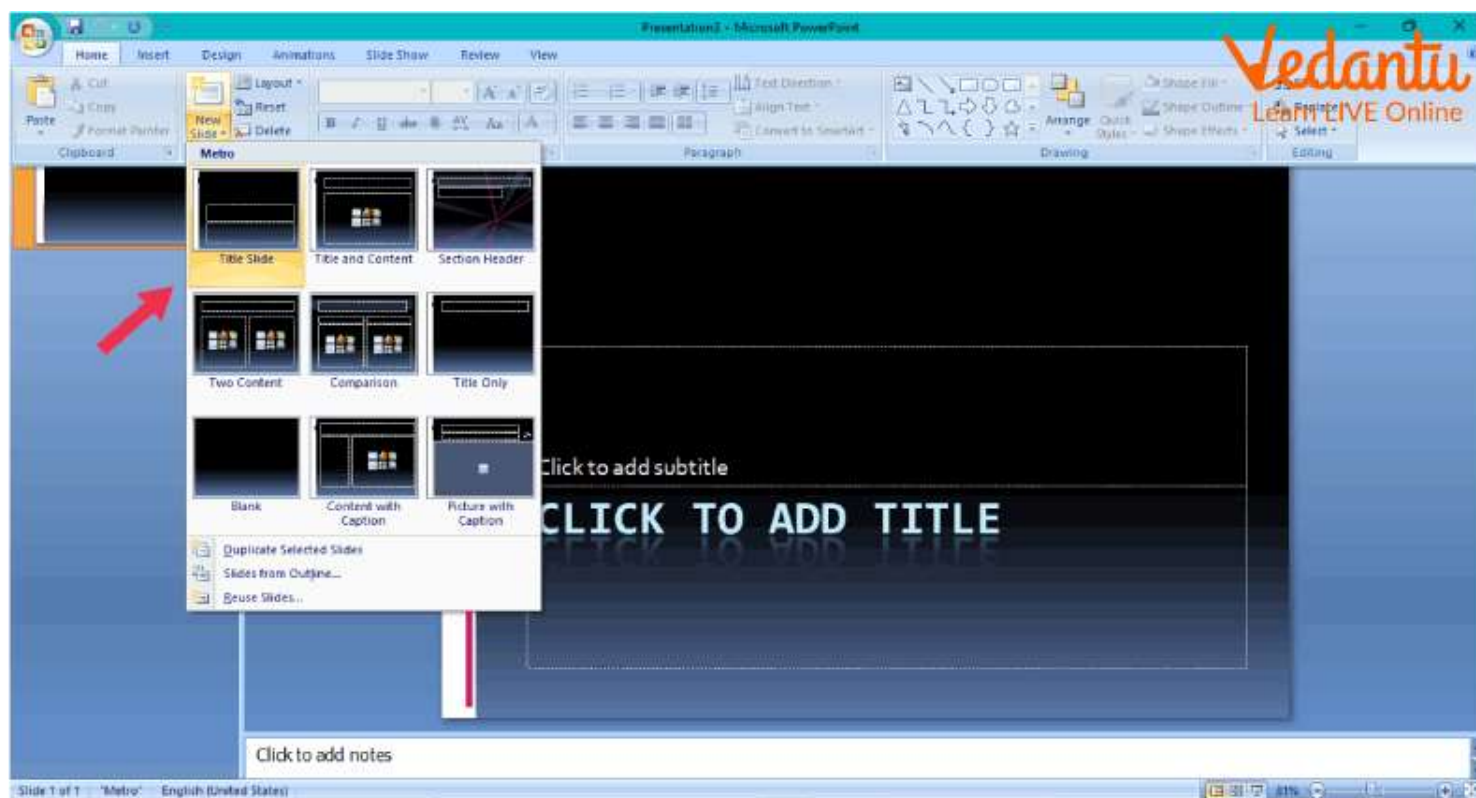
Sample Questions

1. How can we view or run a presentation?

Ans: To run a presentation, either click on the F5 key or select Play from Beginning on the Slideshow Pane.

2. How can we add a blank slide to our presentation?

Ans: For adding a new slide in the same presentation simply click on the Slide icon on the Insert tab and choose the type of slide you want to add from the drop-down menu which unfolds on the screen.



Adding a New Slide



Hands on Practice:



Students Participated list:

1	Bhukya ashwini	MPCs
2	Kemsaram anusha	B.Com(CA)
3	M.Srividya	MPCs
4	B.Sabitha	MPCs
5	Nagurla Manasa	MPCs
6	Thota Pravalika	MPCs
7	Vainala sowmya	MPCs
8	Merugu.triveni	B.Com(CA)
9	Rathipelly Ravali	MPCs
10	E. Rajyalaxmi	B.Com(CA)
11	Kottem keerthipriya	B.Com(CA)
12	Anjali Ummagani	MPCs
13	MANKENA shirisha	MPCs
14	L.Aishwarya	MPCs
15	Sana Farhana	B.Com(CA)
16	Bhukya mounika	B.Com(CA)
17	MD.NEHA	B.Com(CA)
18	Bitla.Pravalika	MPCs
19	Vanga.Bhavani	MPCs
20	Nalla Vandhana	MPCs
21	ALLENKI TEJASWINI	MPCs
22	ADIDALA BHARGAVI REDDY	MPCs
23	Sriramula Lalitha	MPCs
24	Kalyani	B.Com(CA)
25	Manasa amancha	B.Com(CA)
26	M. Deepa	B.Com(CA)
27	Neeraja Madishetty	B.Com(CA)
28	B.kavya	B.Com(CA)
29	G.Bhavya sri	MPCs
30	Sarikoppula Jyoshna	MPCs
31	Kathula Ravali	BSC(Data Science)

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T.Aruna
CONVENER

Prof. B. Chandra Mouli
PRINCIPAL

ABOUT THE WORKSHOP

"Introduction to Python" workshop will be held at Pingle Govt. College for Women (Autonomous), Waddepally, Hanumakonda, on 07th February, 2023. The Aim of the workshop is to provide fundamental knowledge about Programming language and Python Programming .The faculty and students of department of computers attend the workshop.

Python Introduction

Python Introduction
Python Features
Python Applications
Getting started in python
Programming in Immediate mode
Programming in script mode
Input statements
output statements



Introduction to Python Programming

1. Comments
2. Arithmetic Operators
3. Variables
4. Data Type
5. Input/Output
6. Boolean Operators
7. Lists
8. Tuples
9. Strings
10. Manipulating Strings
11. Flow control: For Loops and While Loops
12. Dictionaries and Structuring Data
13. Exceptions
14. Functions
15. Namespace
16. Read and Write Files
17. Sets
18. Introduction to IoT using Python and Cisco Packet Tracer

Principal: Dr.G.Raja Reddy

ORGANIZING COMMITTEE:

Conveners : B. Swarnalatha
: P. Prathibha
: T. Aruna
MEMBERS : P. Bharathi

Seminar hall (Room. No: 47)

ABOUT THE COLLEGE



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**BRIDGE COURSE
ON
INTRODUCTION TO PYTHON
PROGRAMMING LANGUAGE
25TH FEBRUARY, 2021
TO
10TH MARCH , 2021**



Organized by

**DEPARTMENT OF COMPUTER
SCIENCE & APPLICATIONS**

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- Outcome Based Education
- Focus on programming hands-on
- Online Teaching Assistance through Video Lectures
- Motivation for Self learning initiatives
- Well defined student Counseling and Mentoring process
- Maintaining e-Library using QR CODES
- Well defined Teaching– Learning Process with use of Technology Based Teaching Methodologies
- Value added course such as IOT, BIGDATA, CLOUD COMPUTING, PYTHON are regularly offered to students with Online Platforms Spoken Tutorial, Coursera , Edx etc

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Fundamentals of Python

Conditional Statements/ Decision Making Statements

- In Python, the selection statements are also known as Decision control statements or branching statements.
- The selection statement allows a program to test several conditions and execute instructions based on which condition is true.
- Conditional statements are handled by IF statements in Python.

Some Decision Control Statements are:

- Simple if

- if-else
- nested if
- if-elif-else

	Statement & Description
	<u>if statements:</u> An if statement consists of a boolean expression followed by one or more statements.
	<u>if...else statements:</u> An if statement can be followed by an optional else statement , which executes when the boolean expression is FALSE.
	<u>nested if statements:</u> You can use one if or else if statement inside another if or else if statement(s).

If Statement (Simple if):

- *If statements* are control flow statements that help us to run a particular code, but only when a certain condition is met or satisfied.
- A *simple if* only has one condition to check.
- Python if Statement is used for decision-making operations.
- It contains a body of code which runs only when the condition given in the if statement is true.

```
n = 10
if n % 2 == 0:
    print("n is an even
    number")
```

Syntax:

```
if
  expressio
  n
  Statement
```

Example:

```
n = 5
```

```
if n % 2 == 0:
    print("n is
    even")
```

```
else:
```

```
    print("n is odd")
```

if-else statement: The *if-else* *statement* evaluates the condition and will execute the body of **if** if the test condition is True, but if the condition is False, then the body of **else** is executed.

- An else statement can be combined with an if statement.
- The else statement is an optional statement and there could be at most only one else statement following if.

Syntax

```
if
  expression:
  statement(s
  )      else:
  statement(s
  )
```

nested if: *Nested if statements* are an if statement inside another if statement.

if-elif-else statement: The *if-elif-else statement* is used to conditionally execute a statement or a block of statements.

- The elif statement allows you to check multiple expressions for TRUE and execute a block of code as soon as one of the conditions evaluates to TRUE.
- Similar to the else, the elif statement is optional.
-

```
x = 15
y = 12
if x == y:
    print("Both are
Equal") elif x > y:
    print("x is greater
than y")
```

However, unlike else, for which there can be at most one statement, there can be an arbitrary number of elif statements following an if.

Syntax

```
if expression1:
    statement(s)
elif expression2:
    statement(s)
elif expression3:
    statement(
s) else:
    statement(s)
```

Repetition Two (Loop) statements

- A **repetition statement** is used to repeat a group(block) of programming instructions.
- A loop statement allows us to execute a statement or group of statements multiple times.
- In Python, we generally have **loops/repetitive statements:**
 - for loop

● while loop

	Loop Type & Description
	<p><u>while loop</u></p> <p>Repeats a statement or group of statements while a given condition is TRUE. It tests the condition before executing the loop body.</p>
	<p><u>for loop</u></p> <p>Executes a sequence of statements multiple times and abbreviates the code that manages the loop variable.</p>

While Loop:

- A while loop statement repeatedly executes a target statement as long as a given condition is true.

Syntax

```
while  
    expression:  
    statement(  
    s)
```

- Here, statement(s) may be a single statement or a block of statements.
- The condition may be any expression, and true is any non-zero value. The loop iterates while the condition is true.
- When the condition becomes false, program control passes to the line immediately following the loop.

Example

```
count = 0
```

```
while (count < 9):
```

```
    print 'The count is:',  
    count  
    count = count + 1
```

for loop: A *for loop* is used to iterate over a sequence that is either a list, tuple, dictionary, or a set.

We can execute a set of statements once for each item in a list, tuple, or dictionary.

Syntax

for iterating_var in sequence:

statements(s)

•

```
lst = [1, 2, 3, 4, 5]
for i in range(len(lst)):
    print(lst[i], end = " ")
for j in range(0,10):
    print(j, end = " ")
```

If a sequence contains an expression list, it is evaluated first.

- Then, the first item in the sequence is assigned to the iterating variable *iterating_var*.
- Next, the statements block is executed.
- Each item in the list is assigned to *iterating_var*, and the statement(s) block is executed until the entire sequence is exhausted.

Example: for letter in
 'Python':
print 'Current Letter :', letter

Python Lists

Lists are used to store multiple items in a single variable.

Lists are one of 4 built-in data types in Python used to store collections of data, the other 3 are [Tuple](#), [Set](#), and [Dictionary](#), all with different qualities and usage.

Lists are created using square brackets:

```
Example: thislist = ["apple",
                    "banana", "cherry"]
print(thislist)
```

List Items: List items are ordered, changeable, and allow duplicate values.

List items are indexed, the first item has index [0], the second item has index [1] etc.

Ordered: When we say that lists are ordered, it means that the items have a defined order, and that order will not change.

If you add new items to a list, the new items will be placed at the end of the list.

Changeable: The list is changeable, meaning that we can change, add, and remove items in a list after it has been created.

Allow Duplicates: Since lists are indexed, lists can have items with the same value:

```
Example: thislist = ["apple", "banana", "cherry", "apple",  
"cherry"] print(thislist)
```

List Length: To determine how many items a list has, use the **len()** function:

```
thislist = ["apple", "banana",  
"cherry"] print(len(thislist))
```

List Items - Data Types: List items can be of any data

```
type: list1 = ["apple", "banana",  
"cherry"] list2 = [1, 5, 7, 9,  
3] list3 = [True, False,  
False]
```

- A list can contain different data types:

- list1 = ["abc", 34, True, 40, "male"]

type(): lists are defined as objects with the data type 'list': <class 'list'>

Example

```
mylist = ["apple", "banana",  
"cherry"] print(type(mylist))
```

The list() Constructor: It is also possible to use the **list()** constructor when creating a new list. `thislist = list(("apple", "banana", "cherry"))`

```
print(thislist)
```

Python Tuple

Python Tuple is used to store the sequence of immutable Python objects. The tuple is similar to lists since the value of the items stored in the list can be changed, whereas the tuple is immutable, and the value of the items stored in the tuple cannot be changed.

Creating a tuple

A tuple can be written as the collection of comma-separated (,) values enclosed with the small () brackets. The parentheses are optional but it is good practice to use. A tuple can be defined as follows.

```
T1 = (101, "Peter", 22)
```

```
T2 = ("Apple", "Banana", "Orange")
```

```
T3 = 10,20,30,40,50
```



```
print(type(T1))
```

```
print(type(T2))
```

```
print(type(T3))
```

Basic Tuple operations

The operators like concatenation (+), repetition (*), Membership (in) works in the same way as they work with the list.

Let's say Tuple t = (1, 2, 3, 4, 5) and Tuple t1 = (6, 7, 8, 9) are declared.

Operator	Description	Example
Repetition	The repetition operator enables the tuple elements to be repeated multiple times.	T1*2 = (1, 2, 3, 4, 5, 1, 2, 3, 4, 5)
Concatenation	It concatenates the tuple mentioned on either side of the operator.	T1+T2 = (1, 2, 3, 4, 5, 6, 7, 8, 9)
Membership	It returns true if a particular item exists in the tuple otherwise false	print (2 in T1) prints True.
Iteration	The for loop is used to iterate over the tuple elements.	for i in T1:print(i) Output 1 2 3 4

		5
Length	It is used to get the length of the tuple.	len(T1) = 5

Python Tuple inbuilt functions:

SN	Function	Description
	cmp(tuple 1, tuple2)	It compares two tuples and returns true if tuple1 is greater than tuple2 otherwise false.
	len(tuple)	It calculates the length of the tuple.
	max(tuple)	It returns the maximum element of the tuple
	min(tuple)	It returns the minimum element of the tuple.
	tuple(seq)	It converts the specified sequence to the tuple.

Dictionaries

- Dictionaries are used to store data values in key: value pairs.
- A dictionary is a collection which is ordered*, changeable and do not allow duplicates.
-

In Python dictionaries are written with curly brackets, and they have keys and values. Key-value pairs

Unordered

We can construct or create dictionary like:

X={1:'A',2:'B',3:'c'}

X=dict([('a',3) ('b',4)])

X=dict('A'=1,'B' =2)

Example:

```
>>> dict1 = {"brand": "mrcet", "model": "college", "year": 2004}
```

```
>>> dict1
```

```
{'brand': 'mrcet', 'model': 'college', 'year': 2004}
```

- Dictionary items are ordered, changeable, and does not allow duplicates.
- Dictionary items are presented in key: value pairs, and can be referred to by using the key name.
- When we say that dictionaries are ordered, it means that the items have a defined order, and that order will not change.
- Unordered means that the items does not have a defined order, you cannot refer to an item by using an index.
- Dictionaries are changeable, meaning that we can change, add or remove items after the dictionary has been created.
- Dictionaries cannot have two items with the same key

Example: thisdict = {

```
    "brand": "Ford",
```

```
    "model": "Mustang",
```

```
    "year": 1964,
```

```
    "year": 2020
```

```
}
```

```
print(thisdict)
```

Methods: Methods that are available with dictionary are tabulated below.

Method	Description
<code>clear()</code>	Remove all items form the dictionary.
<code>copy()</code>	Return a shallow copy of the dictionary.
<code>get(key[,d])</code>	Return the value of key. If key does not exit, return d
<code>items()</code>	Return a new view of the dictionary's items (key, value).

<code>keys()</code>	Return a new view of the dictionary's keys.
<code>pop(key[,d])</code>	Remove the item with key and return its value or d if key is not found. If d is not provided and key is not found, raises KeyError.
<code>popitem()</code>	Remove and return an arbitrary item (key, value).
<code>setdefault(key[,d])</code>	If key is in the dictionary, return its value. If not, insert key with a value of d and return d (defaults to None).
<code>update([other])</code>	Update the dictionary with the key/value pairs from other, overwriting existing keys.
<code>values()</code>	Return a new view of the dictionary's values

Operations :

- Add/change
- Remove
- Length
- Delete

Add/change values: You can change the value of a specific item by referring to its key name

```
>>> dict1 = {"brand":"mrcet","model":"college","year":2004}
>>> dict1["year"]=2005
>>> dict1
{'brand': 'mrcet', 'model': 'college', 'year': 2005}
```

Remove(): It removes or pop the specific item of dictionary.

```
>>> dict1 = {"brand":"mrcet","model":"college","year":2004}
>>> print(dict1.pop("model")) college
>>> dict1
{'brand': 'mrcet', 'year': 2005} Delete: Deletes a
```

particular item.

```
>>> x = {1:1, 2:4, 3:9, 4:16, 5:25}
```

```
>>> del x[5]
```

```
>>> x
```

Length: we use len() method to get the length of dictionary.

```
>>>{1: 1, 2: 4, 3: 9, 4: 16}
```

```
{1: 1, 2: 4, 3: 9, 4: 16}
```

```
>>> y=len(x)
```

```
>>> y 4
```

Python Functions

- A function is a block of code which only runs when it is called.
 - You can pass data, known as parameters, into a function.
 - A function can return data as a result.
- In Python a function is defined using the **def** keyword:

Example: `def my_function():`

```
    print("Hello from a function")
```

- To call a function, use the function name followed by parenthesis:
 - Example: `my_function()`
- Information can be passed into functions as arguments.
- Arguments are specified after the function name, inside the parentheses.

Example: `def my_function(fname):`
 `print(fname + " Refsnes")`

```
my_function("Rama")  
my_function("Sony")  
my_function("Krishna")
```

Defining a Function

Syntax:

```
def functionname( parameters ):
```

```
    "function_docstring"  
    function_suite  
    return [expression]
```

- To let a function return a value, use the return statement:

Example

```
def my_function(x):
```

```

return 5 * x
print(my_function(
3))
print(my_function(
5))
print(my_function(
9))

```

- You can delete a function with the 'del' keyword. Example: del my_function

Calling a Function

- Once the basic structure of a function is finalized, you can execute it by calling it from another function or directly from the Python prompt.
- Example printme()

```

def printme( str ):
    "This prints a passed string into this function" print str
    return;
printme("I'm first call to user defined function!") printme("Again second call to the same function")

```

Pass by reference vs value

- All parameters (arguments) in the Python language are passed by reference.
- It means if you change what a parameter refers to within a function, the change also reflects back in the calling function.
- For example –

```

def changeme( mylist ):

    "This changes a passed list into this function" mylist.append([1,2,3,4]);
    print "Values inside the function: ", mylist
    return changeme( mylist );

print "Values outside the function: ", mylist

```

Output:

Values inside the function: [10, 20, 30, [1, 2, 3, 4]]

Values outside the function: [10, 20, 30, [1, 2, 3, 4]]

- There is one more example where argument is being passed by reference and the reference is being overwritten inside the called function.

```

def changeme( mylist ):

    "This changes a passed list into this function" mylist = [1,2,3,4];
    print "Values inside the function: ",

```

```

mylist return

changeme( mylist );

print "Values outside the function: ", mylist

```

Python Strings

- Strings in python are surrounded by either single quotation marks, or double quotation marks. 'hello' is the same as "hello".
 - You can display a string literal with the print() function:
Example: print("Hello")
- Python does not support a character type; these are treated as strings of length one, thus also considered a substring.
- To access substrings, use the square brackets for slicing along with the index or indices to obtain your substring.

● For example –

```

var1 = 'Hello World!'
var2 = "Python
Programming"
print "var1[0]: ", var1[0]
print "var2[1:5]: ", var2[1:5]

```

- Python Strings can join using the concatenation operator +.
- ```

>>> a=' Hello! '
>>> b='How are you?'
>>> a+b

```

**Output:** 'Hello! How are you?'

**String Methods:** Python has a set of built-in methods that you can use on strings.

| Method                       | Description                                                                              |
|------------------------------|------------------------------------------------------------------------------------------|
| <a href="#">capitalize()</a> | Converts the first character to uppercase                                                |
| <a href="#">casefold()</a>   | Converts string into lower case                                                          |
| <a href="#">center()</a>     | Returns a centered string                                                                |
| <a href="#">count()</a>      | Returns the number of times a specified value occurs in a string                         |
| <a href="#">find()</a>       | Searches the string for a specified value and returns the position of where it was found |
| <a href="#">format()</a>     | Formats specified values in a string                                                     |
| <a href="#">isalnum()</a>    | Returns True if all characters in the string are alphanumeric                            |

|                                |                                                                             |
|--------------------------------|-----------------------------------------------------------------------------|
| <a href="#">isalpha()</a>      | Returns True if all characters in the string are in the alphabet            |
| <a href="#">isdigit()</a>      | Returns True if all characters in the string are digits                     |
| <a href="#">isidentifier()</a> | Returns True if the string is an identifier                                 |
| <a href="#">islower()</a>      | Returns True if all characters in the string are lower case                 |
| <a href="#">isnumeric()</a>    | Returns True if all characters in the string are numeric                    |
| <a href="#">isprintable()</a>  | Returns True if all characters in the string are printable                  |
| <a href="#">isspace()</a>      | Returns True if all characters in the string are whitespaces                |
| <a href="#">istitle()</a>      | Returns True if the string follows the rules of a title                     |
| <a href="#">isupper()</a>      | Returns True if all characters in the string are upper case                 |
| <a href="#">lower()</a>        | Converts a string into lower case                                           |
| <a href="#">lstrip()</a>       | Returns a left trim version of the string                                   |
| <a href="#">maketrans()</a>    | Returns a translation table to be used in translations                      |
| <a href="#">partition()</a>    | Returns a tuple where the string is parsed into three parts                 |
| <a href="#">replace()</a>      | Returns a string where a specified value is replaced with a specified value |
| <a href="#">split()</a>        | Splits the string at the specified separator, and returns a list            |

|                             |                                                        |
|-----------------------------|--------------------------------------------------------|
|                             |                                                        |
| <a href="#">title()</a>     | Converts the first character of each word to uppercase |
| <a href="#">translate()</a> | Returns a translated string                            |
| <a href="#">upper()</a>     | Converts a string into upper case                      |



# Exceptions Handling

- Python has many **built-in exceptions** that force your program to output an error when something goes wrong.
- When these exceptions occur, it causes the current process to stop and passes it to the calling process until they are handled. If not handled, our program will crash.

**For example,** if **function** A calls function B which in turn calls function C, an exception occurs in function C. If it is not handled in C, the exception passes to B and then to A.

- If never handled, an error message is spit out and our program comes to a sudden, unexpected halt.

- The try...except block is used to handle exceptions in Python.

## Syntax:

### try...except block:

try:

# code that may cause an exception except:

# code to run when an exception occurs

- Every **try** block is followed by an **except** block.
- When an exception occurs, it is caught by the **except** block.
- The **except** block cannot be used without the try block.

## Catching exceptions in Python

- In Python, exceptions can be handled using a try statement.
- A critical operation that can raise an exception is placed inside the try clause and the code that handles the exception is written in except clause.
- It is up to us, what operations we perform once we have caught the exception.

```
import sys
```

```
randomList = ['a', 0, 2] for entry in randomList:
```

```
try:
```

```
print("The entry is", entry)r = 1/int(entry) break
```

```
except:
```

```
print("Oops!",sys.exc_info()[0],"occured.")print("Next entry.") print()
```

```
print("The reciprocal of",entry,"is",r)
```

## Output

```
The entry is a
```

```
Oops! <class 'ValueError'> occured. Next entry.
```

```
The entry is 0
```

```
Oops! <class 'ZeroDivisionError' > occured.Next entry. The entry is 2
```

with a file, or working with a graphic user interface (GUI).

- In all these circumstances, we must clean up the resource once it has been used, whether it was successful or not.
- These actions (closing a file, closing the GUI, or disconnecting from the network) are performed in the finally clause to guarantee execution.

**try:**

```
f = open("test.txt",encoding =
'utf-8') # perform file operations
finally: f.close()
```

### Different types of exceptions in Python:

In Python, there are several built-in exceptions that can be raised when an error occurs during the execution of a program.

Some of the most common types of exceptions in Python are:

1. **SyntaxError:** This exception is raised when the interpreter encounters a syntax error in the code, such as a misspelled keyword, a missing colon, or an unbalanced parenthesis.
2. **TypeError:** This exception is raised when an operation or function is applied to an object of the wrong type, such as adding a string to an integer.
3. **NameError:** This exception is raised when a variable or function name is not found in the current scope.
4. **IndexError:** This exception is raised when an index is out of range for a list, tuple, or other sequence types.
5. **KeyError:** This exception is raised when a key is not found in a dictionary.
6. **ValueError:** This exception is raised when a function or method is called with an invalid argument or input, such as trying to convert a string to an integer when the string does not represent a valid integer.
7. **AttributeError:** This exception is raised when an attribute or method is not found on an object, such as trying to access a non-existent attribute of a class instance.
8. **IOError:** This exception is raised when an I/O operation, such as reading or writing a file, fails due to an input/output error.
9. **ZeroDivisionError:** This exception is raised when an attempt is made to divide a number by zero.

**ImportError:** This exception is raise



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