

Python

3) Input and Output in Python:-

Input is the data given to a program.

Output is the result.

Output in Python is print() function.
print() is used to display output on screen.

Syntax

print(value)

Ex:-

```
print("Hello python")
```

Using numbers:-

```
print(10)
```

```
print(5+3)
```

Printing of Multiple values:-

```
a = 10
```

```
b = 20
```

```
print("Sum is", a+b)
```

In is used to print in the next line.

Using customer separator and end:-

```
print("Python", "java", sep = " ", ")
```

```
print("welcome", end = "\n")
```

```
print("user")
```

Input function:-

In python input() function is used.

This function is used to take the input

* It always read a string

Basic Syntax :-

variable = input("Message")

Type conversion in Input :-

Since input is always string, conversion is required.

Ex :- age = int(input("Enter age:"))
print(age)

Float input :-

Ex :- price = float(input("Enter price:"))
print(price).

Taking multiple inputs :-

Using separate statements :-

a = int(input("Enter a:"))

b = int(input("Enter b:"))

formatted output (using f strings)

name = " "

age =

print(f"Name: {name}, Age: {age}")

Using split()

a, b = map(int, input("Enter two numbers:"))

print(a, b).

split()

Input & Output with Expressions :-

a = int(input("Enter number:"))

print("square:", a * a).

Control Statements in Python :-

Control statements are used to control the flow of execution of a python program.

⇒ Using control statements, we can write decision making, looping, and flow altering programs.

Types of Control statements :-

(1) Decision making statements

(2) Looping statements.

(3) jump / control / Transfer statements.

Decision Making statements :-

These are used to execute code based on conditions depend on true / false.

There are 3 types:-

(1) if

(2) if else

(3) if - elif - else

if statement :-

Executes only when one condition is true

Syntax :- if condition:

 statement .

if - else statement :-

Executes only when condition is true and executes
 if it is false

Syntax

```
if condition:  
    statement  
else:  
    statements
```

if-elif-else - statement :-

It is used to check multiple conditions.

elif \Rightarrow else if .

Syntax :- if condition:

```
    statement  
    elif condition:  
        statement  
    elif condition:  
        statement  
    else condition:  
        statement .
```

5) Python Programming - fundamentals :-

Python programming fundamentals include variables, data types, control statements, functions etc.

Key fundamentals :-

Variables and Data Types:-

Variables are used to store information in python.

Python is dynamically-typed so we don't need to declare data-type. Common data-types are.

- (1) Integers
- (2) float
- (3) strings
- (4) Boolean .

Operators:-

Operators are symbols which are used to perform operations on values and variables. These include arithmetic, assignment and comparison operators.

Arithmetic Operators (+, -, *, /, //)

Assignment operators (=, +=, -=)

Comparison operators (==, !=, >; <)

Control statements:-

Statements that control the flow of execution in program.

Decision making statements like if, else, if else, elif else.

Looping statements like for and while loops.

functions:-

Reusable blocks of code that perform a specific task is known as functions. They are defined using the keyword "def" and can accept parameters and return values.

Input and Output:-

functions like print() display output to the screen, whereas input() function gets data from the user via the keyboard.

Data Types in Python:-

Data types specifies what kind of data a variable holds, python determines data types

automatically.

Numeric Data Type :-

Int :-

* Stores whole numbers

* Positive or negative.

$a = 10$

$b = -5$

float :-

* Stores decimal numbers

$\pi = 3.14$

$y = 10.5$

Complex :- stores numbers in $a + bj$ format.

$z = 2 + 3j$

Sequence Data Type :-

list :- ordered collection, mutable

$marks = [80, 85, 90]$

tuple :- ordered collection, immutable

Range :- represents sequences of numbers

$r = range(1, 5)$

Set Data Type :- * No Duplicate values

$S = \{1, 2, 3\}$

Mapping Data Type :-

dict :- stores data in key-value pairs.

Boolean Data Type :-

bool :-

* Stores only true or false

* Used in decision making.

Programming and Python in Detail :-

Programming is the process of writing instructions that a computer follows to perform a task.

Purpose :-

- * Computer cannot think own.
- * They only understand instructions.
- * This makes humans better and easier.

Python :-

Python is a high level language interpreted, general purpose programming language.

Characteristics :-

- * Simple and easy
- * Interpreted language
- * High level language
- * Dynamically typed
- * Open Source and free.

Applications :-

- * Used in Analytics, web development, desktop applications, automations, game development.

Comments in Python :-

Comments are non-executable lines used for explanation. There are 2 types.

- (1) Single line Comment

Multi-line Comment

Single line Comment :-

- * written using the symbol `#`

- * It uses double quotes `" "`

Multi-line Comment :-

- * It also writes in all syntax

- * It uses triple quotes `''' ''''`

Ans Continuation :-

Operators are special symbols used to perform one or more operations.

Assignment Operator :-

Used to assign or update values in a variable.

`+ = x += 5`

`= x = 5`

`- = x -= 5`

`* = x *= 5`

`/ = x /= 5`

Membership operator :-

checks the value exists in sequence.

It is used in lists, strings, tuples.

`in` Present

`not in` not present

`list1 = [1, 2, 3]`

`print(2 in list1)`

`print('a' not in 'python')`

Identity Operators:

Used to check whether two variables refers to the same memory object.

It do not compare values, but object identity.

is same object

is not different object.

$a = 10$

$b = 10$.

Real-World problems using Python

- 1)

```
age = int(input("Enter age: "))
is_3D = int(input("Enter 1 for 3D movie, 0 for normal: "))

if age < 13:
    price = 150
elif age <= 59:
    price = 250
else:
    price = 200

if is_3D == 1:
    print += 50
print ("final ticket price:", price)
```

Output
Enter age: 65
Enter 1 for 3D movie, 0 for normal: 1
final ticket price: 250.
- 2)

```
attendance = int(input("Enter attendance: "))
medical = int(input("Enter medical certificate (1=Yes, 0=No): "))

if attendance >= 75 or (attendance >= 60 and medical
                           = = 1):
    print ("Allowed")
else:
    print ("Not allowed")
```

Output
Enter attendance: 65
Enter medical certificate (1=Yes, 0=No): 1
Allowed
- 3)

```
battery = int(input("Enter battery percentage: "))
is_charging = int(input("Enter 1 if charging, 0 if not
                           charging: "))

if is_charging == 1:
    print ("charging")
else:
    if battery <= 20:
        print ("low battery")
```

```
elfif battery <= 80:  
    print("normal")  
else:  
    print("full")
```

→ enter battery percentage: 15
→ Enter 1 if charging, 0 if not
charging: 0
done battery

5) age = int(input("Enter age : "))
test passed = int(input("Enter driving test passed
(1=Yes, 0=No): "))
if age >= 60:
 print("Eligible")
elif age >= 18 and test passed == 1:
 print("Eligible")
else:
 print("Not Eligible")

→ enter age: 25
enter driving test passed
(1=Yes, 0=No): 1
Eligible.

6) amount = float(input("Enter order amount: "))
isGold = int(input("Enter 1 if Gold member, 0 otherwise: "))
distance = float(input("Enter delivery distance
in km: "))
if distance > 10:
 print("Delivery not free")
elif amount >= 500 or isGold == 1:
 print("free Delivery")
else:
 print("Delivery Not free")

→ Enter order amount
: 450
→ Enter if gold member,
0 otherwise: 1
→ Enter delivery distance
in km: 8
→ free delivery.

7) salary = int(input("Enter salary: "))
creditscore = int(input("Enter creditscore: "))
if (salary >= 30000 and creditscore >= 700) or
(salary >= 50000):

```
print("loan Approved")
else:
    print("loan Rejected").
```

Input
Salary = 52000
Credit score = 600
loan Approved

9) Marks = int(input("Enter marks: "))
Income = int(input("Enter income: "))
Single parent = int(input("Single parent (1=Yes, 0=No): "))

if marks >= 85 and (income <= 500000 or
single parent == 1):
 print("scholarship Approved")
else:
 print("scholarship Not Approved")

Enter marks = 100
Enter income = 600000
Single parent = 1
Scholarship Approved

10) theory = int(input("Enter theory: "))
practical = int(input("Enter practical: "))
total = theory + practical
if (theory >= 40 and practical >= 40) or total >= 100:
 print("Pass")
else:
 print("fail")

Enter theory: 46
Enter practical: 55
Pass.

12) ~~1000/-~~ racing:-

```
isweekend = int(input("Is it Enter 1 for weekend else 0:"))
daysstayed = int(input("Enter the number of days:"))
isweekend == 1:
    price = 4000
else:
    price = 3000
total = price * daysstayed
if days > 3:
    total = total - (total * 0.15)
print("final Bill: ₹", total)
```

Weekend = 0
Days = 4
 $3000 \times 4 = 12000$
15% discount = 1800
final bill = 10200.

13) ~~1000/-~~ game:-

```
s = int(input("Enter score:"))
ispremium = int(input("Enter 1 for premium pass else 0:"))
usedcheat = int(input("Enter 1 for used cheating else 0:"))

if usedcheat == 1:
    print("level locked")
elif score >= 100 or ispremium == 1:
    print("Next level unlocked")
else:
    print("level locked")
```

S = 120
ispremium = 0
usedcheat = 0
Level unlocked.

```
D = float(input("Enter data used in GB:"))
ff = int(input("Enter 1 for unlimited plan else 0:"))
R = int(input("Enter 1 for roaming else 0:"))
```

if $R \geq 1$:
 if $D \leq 2$:
 print ("unlimited data available")
 else:
 print ("limited data")
else:
 if $D \leq 2$ or $H = 1$:
 print ("unlimited data available")
 else:
 print ("limited data")

(4) $I = \text{int}(\text{input}("Enter 1 for ID valid else 0:"))$
 $f = \text{int}(\text{input}("Enter 1 for fingerprint match else 0:"))$
 $fScan = \text{int}(\text{input}("Enter 1 for face scan match else 0:"))$
 $isholiday = \text{int}(\text{input}("Enter 1 for holiday else 0:"))$
if $isholiday = 1$:
 print ("Entry denied")
elif $I = 1$ and ($f = 1$ or $fScan = 1$):
 print ("Entry allowed")
else:
 print ("Entry denied")

$I \neq 1$,
 $f \neq 0$,
 $fScan \neq 1$,
 $holiday \neq 0$,
Entry denied.

```

if R == 1:
    if D <= 2:
        print ("unlimited data available")
    else:
        print ("limited data")
else:
    if D <= 2 or H == 1:
        print ("unlimited data available")
    else:
        print ("limited data")

```

(4) $I = \text{int}(\text{input}("Enter ID valid else 0:"))$

$f = \text{int}(\text{input}("Enter 1 for fingerprint match else 0:"))$

$fScan = \text{int}(\text{input}("Enter 1 for face scan match else 0:"))$

$isholiday = \text{int}(\text{input}("Enter 1 for holiday else 0:"))$

if isholiday == 1:
 print ("entry denied")
elif ir == 1 and (f == 1 or fScan == 1):
 print ("entry allowed")
else:
 print ("entry denied")

$I \neq 1$,
 $f \neq 0$,
 $fScan \neq 1$,
 $Holiday \neq 0$,
 Entry allowed.

```
AR = float(input("Enter average rating:"))
I = int(input("Enter 1 for editor choice else 0:"))

if I == 1:
    print("Recommended")
elif AR >= 8.5:
    print("Excellent")
elif AR >= 6.0:
    print("Good")
else:
    print("Average")
```

$AR = 4.5$
 $I = 1$
Recommended.