

## \* Data types:-

Data types define the type of data a variable can store and how python will handle that data.

python is dynamically typed - meaning you don't need to declare the type explicitly - it's decided at runtime.

### 1. Basic (single value) data types:-

\* int → integer num

`x = 10`

`y = -25`

\* float → decimal (floating-point) num.

`pi = 3.14`

`temp = -7.5`

\* complex → number with real + imaginary part.

`z = 2 + 3j`

\* str → string (sequence of character).

`name = "python".`

### 2. collection (multi value) data types:-

\* list → ordered, mutable (can change), allows duplicates.

`fruits = ["apple", "banana", "mango"].`



\* tuple → ordered, immutable (cannot change), allow duplicates.

colors = ("red", "green", "blue").

\* set → unordered, mutable, no duplicates.

num = {1, 2, 3, 4, 5} # {1, 2, 3, 4}.

\* dict → key-value pairs, unordered, mutable.

student = {"id": 101, "name": "Nagi",

### 3. Boolean Type:-

\* bool → Represents 'true' or 'false'

is-active = true → non empty string ex:- bool("0")

is-logged-in = false. → empty string ex:- bool(0), bool("")

### 4. None Type:-

\* None type → special type representing "nothing" or "no value"

x = None.

Ex:-

a = 10 # int

b = 3.14 # float

c = 2 + 5j # complex

name = "Nagi" # str

status = true # bool

marks = [90, 85, 92] # list

colors = ("red", "blue") # tuple

unique\_nums = {1, 2, 3} # set

student = {"id": 1, "name": "suman"} # dict

nothing = None # None type.

### \* Input function :- (input())

• use to take input from the user.

• whatever we type is always treated as a string, unless commented.

Ex:- name = input("enter your name :") # user types something



\* `age = int(input("enter your age"))` # converting to integer  
`print("you are", age, "years old")`

\* output function :- `(print())`

- python uses `print()` for output (not `output()`).
- used to display message, variables, results, etc.

ex:- `print("welcome to python!")`

`x = 10`

`print("The value of x is :", x)`

\* `input` → `input()`

\* `output` → `output()`.

\* Example programs :-

1) \* `print("hello good afternoon")`

o/p:- hello good afternoon.

2) `name = input("enter your name: ")`

`age = int(input("enter your age: "))`

o/p:- enter your name: Nagi  
enter your age: 21

My name is Nagi and age 21.

\* `print("my name is", name, "my age is", age)`

o/p:- my name is Nagi my age is 21.

\* `print("my name is {} and age is {}".format(name, age))`

o/p:- my name is Nagi and age is 21.

\* `print(f"my name is {name} and my age is {age}")`

o/p:- my name is Nagi and my age is 21.

Read 2 number from user and perform all basic calculator operation.

`a = float(input("enter a value"))`

`b = float(input("enter a value"))`

`print(f"sum of {a} and {b} is {a+b} in sub of {a} and {b} is {a-b}")`

o/p:- enter a value - 5

enter a value - 10

sum of 5.0 and 10.0 is

sub of 5.0 and 10.0 is -5.0

write a program to calculate area of triangle and circle.

`b = float(input("enter a base value"))`

`h = float(input("enter a height value"))`

`r = float(input("enter a radius value"))`

`area = 0.5 * b * h`



$$aoc = 3.142 * r * r$$

print (f"area of triangle is {aot} in area of circle is {aoc}")

o/p:- enter a base value 4.  
 enter a height value 5  
 enter a radius value 8.  
 area of tringle is 10.8  
 area of circle is 201.088

''' take input from the user stu id, name, 3 subject marks and display all the details with total marks and percentage '''

name = input ("enter your name").

- stu\_id = float (input ("enter a stu id"))

sub1 = int (input ("enter your marks"))

sub2 = int (input ("enter your marks"))

sub3 = int (input ("enter your marks"))

percentage = int (input ("enter your percentage"))

print (f" name {name} in stuid {stu\_id} in sum of marks {sub1 + sub2 + sub3} in total percentage {percentage}")

o/p:- enter your name Nagi

enter your a stu\_id 417

enter your marks 90

enter your marks 85

enter your marks 85

enter your percentage 80

name Nagi

stuid 417.0

sum of marks 260