

## \* 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 = -4.5

\* 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 converted.

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 :") o/p:- enter your name: Nagi  
age = int(input("enter your age :")) 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 numbers from user and perform all basic calculator operations.

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

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

```
print (f"sum 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.
```

$$aoc = 3.142 * r^2$$

print ("area of triangle is %d" % area)   
 print ("area of circle is %d" % aoc)

O/P:- enter a base value 4.

enter a height value 5

enter a radius value 8.

area of triangle 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 ("name %s" % name), "stu id %d" % stu\_id, "sum of marks

{sub1 + sub2 + sub3} / total percentage %d" % percentage).

O/P:- enter your name Nagi

enter your a stu\_id 417

name Nagi

enter your marks 90

stu\_id 417.0

enter your marks 85

sum of marks 260

enter your marks 85

enter your percentage 80