

## Basics

```
pt("Hello world")
```

### Indentation

```
pt("This is about indentation")
```

```
if 3 > 1:
```

```
    pt(
```

```
    pt(
```

```
else: pt(" ")
```



### Comments

```
# This is single line comment
```

```
"""  
These are multi line  
comments  
"""
```

### Special

```
pt("welcome to python where we are working on")
```

```
pt("Hello world")
```

```
pt("This is 'python' class")
```

```
pt("python's class")
```

### Execution

a.py

```
#!/usr/local/bin/python3
```

```
pt("Hello world")
```

```
pt("Hello learning python")
```

chmod +x a.py

./a.py ✓

# Basics of Variables / Data types

x = 4

print(x) # x

print("hello") # hello

y = 5.6

print(y) # 5.6

x = 23 (new value)

print(x) # 23

print(type(x), type(y)) # class <int>  
class <float>

del x  
# print(x)

⇒ java\_version = 1.8

x { } x not valid  
{ x }

print = 2  
print(print) x No keyword

⇒ my\_name = "harvard"  
(letters, numbers, -)

⇒ my\_name = "harvard" # don't give space  
4x526 = 22.6 → Do not start with number

⇒ x = 10 } Case Sensitive  
x = 11 }

⇒ -x = 10 # Can't start with - (not with number)

## Data type - 2

```

a = eval(input("no1"))
b = eval(input("no2"))

```

```
a = eval(input("1st no. : "))
b = eval(input("2nd no. : "))
type(a)
```

$a = \text{eval}(\text{input}(\text{" "}))$   
 $b = \text{eval}(\text{input}(\text{"no2"}))$   
 $p \vdash \{ \text{a type: } \{ \text{type}(a) \}, \text{ b type: } \{ \text{type}(b) \} \}$

$$\text{result} = a + b$$

result = a + b  
 pt (f' result is {result})

→ print no  
x=3, y=5.7; y lang="python"

$t = \text{no}$   
 $x = 3, y = 5.7; y \text{ lang} = \text{"python"}$   
 $\text{pt} [t' \in \{23, y: \{y\} \text{ in lang is } \{ \text{lang } \{ \}$

$\hookrightarrow x: 2-3, y: 5-7$ , lang is "python"

↳ Conversions

→ Conversion

$x = 3$   
 $y = 4j$   
 $z = 3 + 4j$

$\left. \begin{array}{l} x = 3 \\ y = 4j \\ z = 3 + 4j \end{array} \right\}$

$\langle \text{class 'int'} \rangle$   
 $\langle \text{class 'float'} \rangle$   
 $\langle \text{class 'complex'} \rangle$

b. `my_name = "naresh"` // `"naresh"`  
`is_bool`

my\_name = True  
False

```
my_val = False // error
my_val = True // error
my_val = "True" // string
```

my-value = true // string ✓  
my-value = "True" // string ✓



## Conversion x Data types

a.  $x = 56$   
 $y = \text{str}(x)$  } class 'int'  
                              class 'str'

b.  $p = 0$   
 $\text{type}(p) \rightarrow$  class 'int'  
 $p = \text{bool}(p) \rightarrow$  class 'bool'

c.  $x = "45"$   
 $\text{int}(x) \rightarrow 45$  ✓

d.  $x = 45$   
 $\text{bool}(x) \rightarrow \text{True}$   
 $y = 45.6$   
 $\text{bool}(y) \rightarrow \text{True}$   
 $z = "Narendras"$   
 $\text{bool}(z) \rightarrow \text{True}$

e.  $\text{bool}(0)$   
 $\text{bool}("") \rightarrow \text{False (string)}$   
 $\text{bool}([])$   
 $\text{bool}(\{\}) \rightarrow \text{False (list)}$   
 $\text{bool}(\{\}) \rightarrow \text{False (dict)}$   
 $\text{bool}(\{\}) \rightarrow \text{False (tuple)}$   
 $\text{bool}(\{\})$   
 $\text{bool}(\text{None})$   
 $\text{bool}(0.0)$   
 $\text{bool}(0)$   
 $\text{bool}(0.0 + 1j)$  } False

ABdul

DATE (3)

- a. Numeric types
- b. Variables
- c. Literals
- d. Conversion

Program :- set of instructions which understood by computer.

- Program } Operations performed on data  
i. Data } Instructions  
ii. instructions }

Variable :-

- a. Names given to data

Variable  
lenstrs = 15

b. Memory :- Referring to data

a. Integer: 15

b. price: 12.75

c. name: "John" (String)

Name, price, qty = "sachin", 12.75, 3 ✓

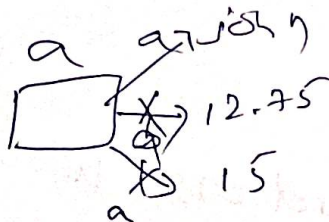
c. a, b, c = 1      a = b = c = 1  
id(a), id(b), id(c) ⇒ are same.

Python dynamically typed

$a = 15$   
 $b = 12.75$   
 $c = "john"$

$a = 12.75$  (float)  
 $b = 15$  (int)  
 $c = "cholo"$  (str)

$a = 15$   
 $a = 12.75$   
 $a = "john"$



## Rules

$a1 = 10$   
 $1a = 10$  X  
 $abc\_def = 10$  ✓  
 $-abc\_def = 20$  ✓  
 $abc\_def = 20$  X  
 $False = "yes"$  X  
 $false = "yes"$  X  
 $pt(false) \neq yes$

$A1 = 10$  ✓  
 $Cust\_name = "john"$  ✓  
 $(cust\_name = "john")$  X  
 $Cust\_name = "john"$  X  
 $-cust\_name = "james"$  ✓  
 $1a = 10$  X  
 $None = "Deli"$  X  
 $it = "10"$  X  
 $False = "yes"$  X  
 $false = "yes"$  ✓

## b. Case Sensitive

$Price = 19.99$   
 $price = 29.99$   
 $Price = "yes"$

## Python Data types

a. Numeric: single values  
 int:  $x = 5$   
 Float:  $y = 28.5$   
 Complex:  $x = 3 + 4j$   
 Bool: term = False/True



## Sequence

(Datatype 4)

List:

lst1 = [2, 4, 6, 8, 10]

→ mutable → [2, 7, 6, 8, 10]

ordered, Indexed, mutable

## Tuple

tpl1 = (1, 3, 5, 7) → Immutable (1, 3, 5, 7)

Ordered, Indexed, Immutable

## String

"python" → Immutable

Ordered, Indexed, Immutable

## Set

Set1 = {2, 4, 6, 8, 10} → collection of values

unordered, unindexed, immutable, no dups

## Dict

Key: value pair  
collection of key, value pair

keys are unique  
D = {name: "john", roll: 12.6, dept: "cse"}

Ordered, Mutable (changeable) key/value pair

## Numeric

int  
float  
Complex  
Bool

## Data types

import sys

x = 101

y = 1234 ..... 89

sys.getsizeof(x) # 28

sys.getsizeof(y) # 40

↳ a = 29.75

b = 3.75

c = 2.5E2

d = -3.1E-2

23.45

2345

100

2345E-2 ✓

getsizeof(a) # 24

↳ Bool | Complex

x = True - 1  
y = False - 0

a = 10

b = 5

a > b → True

a > b → True

int(x), int(y) # 1, 0

x = True  
y = False

## Complex

c = 10 + 5j

type(c) → Complex

c = complex(-5, -3.1)

pt(c) ⇒ (-5 - 3.1j)

## Literals

integer

Literals :-

A = 201

B = 135-246-198

C = 13-52-46-198

D = 358 - X

E = -124

## Float literals

C = 12E2

D = 12.5E-2

E = 12-5.67 / 12-5.6-7

F = 5 - . - 9



## Bool Literals

$a = \text{True/False}$

## Complex Literals

$a = 4 + 5j$

$b = 1.2 + 1.4j$

$c = 1.4 + 2.5j$

## String Literals

$\text{Name} = 'alex'$

$\text{Name2} = "alex"$

$\text{Name3} = '''Hi How'''$

## Integer Literals

$a = 10$

$b = 0b1010$

$c = 0012$

$A = 0xA$

$C1 = 0b1010 + 15j$

$\text{bin}(10)$

$\text{oct}(10)$

$\text{hex}(10)$

$\text{bin}(15)$

$\text{oct}(15)$

$\text{hex}(15)$

$\text{bin}(\text{True})$

$\text{bin}(1.0)$

$10$   
 $10$   
 $10$   
 $10$   
 $10 + 15j$

$0b1010$

$0012$

$0xA$

$0b1111$

$0017$

$0xF$

$\# 0b1$

$\Rightarrow \text{TypeError}$

Datatype - 5

$\rightarrow \text{class str}$

$\rightarrow \text{class str}$

$\rightarrow \text{class str}$

## Type Conversions

int

float

bool

string

big

hex

a. `int(16.59)`  $\rightarrow 16$   
b. `type(int(16.59))`  $\Rightarrow$  class 'int'

c. `int(True)`  $\rightarrow 1$

d. `int('125')`  $\rightarrow 125$

e. `int('0b1010', 2)`  $\rightarrow 10$

f. `int('0xA', 16)`  $\rightarrow 10$

`int('Alexa')` X

`int(3+4j)` X

float

int

bool

float

`float(125)`  $\Rightarrow 125.0$   
`float(True)`  $\neq 10$   
`float(12.75)`  $\neq 12.75$

Strings

bool:

`bool(10)`

`bool(-12)`

`bool(-12E-3)`

`bool(3+4j)`

`bool('false')`  $\neq \text{True}$

`bool()`

`bool(0)`

`bool(False)`

} False

## Complex

int :  $\text{complex}(10)$   $10+0j$   
float :  $\text{complex}(12.5)$   $= -12.5+0j$   
bool :  $\text{complex}(\text{True}) \rightarrow 1+0j$   
complex :  $\text{complex}(3+4j) = 3+4j$

datatype 6

## String

int :  $\text{str}(10)$   $10$   
 $\text{str}(12) = -12$   
 $\text{str}(-1.2e-3) \neq -0.002$   
 $\text{str}(\text{False}) \neq \text{false}$   
 $\text{str}(3+4j) \neq 3+4j$



