

# Python Programming

## Assignment - 2

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- 1) Write a program to display:
- Value
  - Type
  - Memory Address
- for a variable using appropriate built in function.

→

No = 11

print(No) # 11

print(type(No)) # <class 'int'>

print(id(No)) # ~~some~~ 1401702857

- 2) What is difference between:

a = 10

b = 10

and

a = [10]

b = [10]

Explain using id().

→ print(fd(a))  
if a = 10 &  
b = 10

so,

print(fd(a)) # same memory Address  
print(fd(b)) # same memory Address.

because of python uses immutable objects  
both variables point to the same object.

and

$a = [10]$

$b = [10]$

`print(id(a))` # different memory address  
`print(id(b))` # different memory address.

Lists are mutable that is why each variable points to different memory object and separate memory is allocated.

- 3) What does the `id()` function return?  
Is the value returned by `id()` same for two variables holding the same value?

→ The `id()` function returns the unique identity (memory address) of an object. This helps understand how Python manages memory and object references.

- If the two variable holding same value but value is immutable then value returned by `id()` function is same for both objects.

Ex.  $a = 10$

$b = 10$

`print(id(a))` # same memory address  
`print(id(b))` # same memory address.

- If the two variable contain or holding the mutable data types like list then value returned by the `id()` function is different for both variables.

Ex.  $x = [1, 2, 3]$   
 $y = [1, 2, 3]$

`print(id(x))` # different memory Address  
`print(id(y))` # different memory Address.

4) What is purpose of `getsizeof()`?  
Why is memory size different for different data types?

→ The `getsizeof()` function returns the memory size (in bytes) occupied by an obj.

Helps to understand:

- memory usage
- difference between data types
- performance consideration

Why memory size different for different data types -

different data types use different amount of memory because each data type has a different internal structure and purpose.

- Int stores whole numbers
- float stores decimal values
- string stores multiple characters
- list, tuple and dict store a collection and references.

That is why memory size different for different data types because each data type

designed to store data efficiently, so memory size varies based on how the data is represented internally.

5) Predict the output:

$a = 10$

$b = 10$

`print(id(a) == id(b))`

Explain why this happen.



When we,

$a = 10$

$b = 10$

`print(id(a) == id(b))` # True

The output of the program is True.

Because when we assign same value to different variables but the value is immutable then these different variables point to same memory address.

That is why `id(a) == id(b)` is true in this variable a and b point to the same memory location.

6) Write a program that accepts two numbers from user and prints their:

- Addition
- subtraction
- multiplication
- division.



→ program that accept user input and performs following operations:

- Addition
- subtraction
- multiplication
- division

a = float(input("Enter first number :"))  
b = float(input("Enter second number :"))

print ("Addition : ", a+b)

print ("subtraction : ", a-b)

print ("multiplication : ", a\*b)

print ("Division : ", a/b)

O/P → Enter first number : 20

Enter second number : 10

Addition : 30

subtraction : 10

multiplication : 200

Division : 2

7) Why does input function always return a string?  
How can you convert it into another data type?

→ ~~Explain what the user command do?~~

The input() function in python accept user input and read as text (a line of characters).

- Therefore, python always returns the value as a string, even if numbers are entered.

How to convert it to another data type:-

python provides type conversion functions:

Ex. `x = int(input())` # convert to integer  
`y = float(input())` # convert to float

8) Predict the output:

```
x = input("Enter number :")
```

`print(type(x))`

Explain the reason.

→ `x = input("Enter number :")`

`print(type(x))`

# <class 'str'>

→ The type of the x is str.

Because python accept the input and the input() function read the input as text.  
That is why the type of x is string (str).

9) Write a program to take user's name and age and display:

Hello <name>, you will turn <age+1> next year.

```
→ name = input("Enter your name: ")
age = int(input("Enter your age: "))
```

```
Print(f"Hello {name}, you will turn {age+1}
next year.")
```

O/P → sudarshan

Enter your name: sudarshan

Enter your age: 21

Hello sudarshan, you will turn 22  
next year.

10) what will be the output:

```
print("10" + "20")
```

```
print(10 + 20)
```

Explain the difference

```
→ print("10" + "20") # 1020
```

```
print(10 + 20) # 30
```

In this print statement `print("10" + "20")`  
both the values are in double quotes  
that is why they are considering as a  
string and we performing "+" operation

It indicates that the concatenation operation on string.

∴ The output of this print statement is 1020.

In the second print statement print (10+20) both the values are integers and that why the operation performing on them is Addition that the output of second print statement is 30.