

# Python Programming

## Assignment -3

PAGE No.

DATE

1) What is user defined function?

Write a function to accept two numbers and return their multiplication.



A User defined function is a function created by programmer to perform a specific task using the def keyword.

function that accept two numbers and return their multiplication :

```
def multiply(a,b):  
    return a*b
```

2) What is difference between :

- Function with parameters
- Function without parameters

Give one example of each

→ i) function with parameters -

A function with parameters accept values from the caller and uses them to perform a task.

Ex.

```
def add(a,b):  
    return a+b
```

```
result = add(5,3)  
print(result)
```

# 8

### ii) Function without parameters -

A function without parameters does not accept any input. It performs a task using fixed values or internally defined data. Such functions are simple but less flexible.

```
def greet():
```

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

### 3) Predict the output -

```
def fun():
```

```
    x=10
```

```
    print(x)
```

```
fun()
```

```
print(x)
```

Explain the reason.



```
def fun():
```

```
x=10
```

```
print(x)
```

```
fun()
```

```
print(x)
```

O/P → 10

NameError: name 'x' is not found

### Reason (Explanation):

- $x = 10$  is defined inside the function func() so it is called local variable.
- local variable exist only within function block.
- when `print(x)` is executed outside the function, python cannot find  $x$ .
- therefore, python raises a `NameError` because  $x$  is not accessible outside the function.

4)

Write a function that does not return anything but print a message. Explain the default return value of such a function.



The function that does not return anything but print message.

```
def show_message():
```

```
    print("Hello, this function does not return  
any value.")
```

```
result = show_message()  
print(result)
```

Output → Hello, this function does not return any value.  
None

∴ In python, if a function does not use the return statement, it automatically return None.

5) What is difference between:

print()

return

Explain with example.



print() -

The print() function prints the given object(s) to the standard output stream.

- The print() function is the built-in function in Python.

- It is used only for displaying output
- It does not return the printed value
- Its return value is None.

return -

The return statement exists a function and return a value to the caller.

- It sends a value back to the calling code.
- The return value can be stored and reuse.
- If no value is specified, it return None.

print() - Example:-

```
def show():
```

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

```
x = show()
```

```
print(x)
```

# Hello

# None.

return - Example -

```
def show():
    return "Hello"
```

```
x = show()
print(x)           # Hello
```

(6)

Write a program to display:

- data type
- memory Address
- size of variable entered by a user.

→

```
No = int(input("Enter a number:"))
```

```
from sys import getsizeof
```

```
value = input("Enter the value: ")
```

```
print(value)
```

```
print("data type", type(value))
```

```
print("memory Address", id(value))
```

```
print("size of value", getsizeof(value)).
```

O/P → Enter the value: 123

123

<class 'str'>

1234567893

48

7) predict the output:

`a = 5`

`print(type(a))`

`a = 5.5`

`print(type(a))`

`a = "python"`

`print(type(a))`

What python feature does this demonstrate?

→ `a = 5`

`print(type(a))` # <class 'int'>

`a = 5.5`

`print(type(a))` # <class 'float'>

`a = "python"`

`print(type(a))` # <class 'str'>

python feature demonstrated -

Dynamic Typing -

- You do not need to declare variable data type
- The type is decided at runtime.
- The same variable can refer to different data types at different times.

8) Explain why the following code runs without declaration:

$x = 100$

Compare this with C and Java.

→ Python -

$x = 100$

In Python, variables do not need prior declaration because Python is a dynamically typed language.

- Python creates a variable at runtime?
- The data type is assigned automatically at the runtime
- Here, 100 is an integer (so Python)
  - creates an int object
  - makes  $x$  reference to that object

You are binding a name ( $x$ ) to an object (100), not declaring storage.

C language -

`int x = 100;`

Why declaration required in C:

- C is statically typed
- The type must be declared before use
- memory size fixed at compile time
- compiler must know:
  - data type
  - memory allocation
  - type checking

• Without declaration C throws compile time error.

## Comparison with Java

int x = 100;

- Java is also statically typed language.
- Variable type checked at compile time.
- Java enforces strong type safety.
- memory layout and type rules must be known in advance.

9) What is the difference between:

x = 100

x = "Ten"

Is this allowed & why?

→

x = 10

x = "Ten"

yes this allowed in python.

- Because python is dynamically typed language
- In python, variables are references to objects not fixed memory locations with a fixed data type.

10) Explain how python manages memory automatically.  
Why does programmer not need to explicitly allocate or free memory?

→

Python manages memory automatically, using a built-in memory manager, reference counting and garbage collection. All the objects are allocated on the heap and memory is automatically freed when objects are no longer referenced. Therefore, programmers do not need to explicitly allocate or deallocate memory in Python.

- Python uses automatic memory management, meaning memory allocation and deallocation are handled by the Python interpreter, not by the programmer.