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Functions & Recursions

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A function is a group of statement programming a specific task.

When a program gets bigger in size & its complexity grows, it gets difficult for a programmer to keep track on which piece of code its doing what?

A function can be reused by the programmer in a given program any number of

Example & Syntax of a function.

The syntax of a function looks as follows.

```
def func1():
    print("Hello")
```

This function can be called any number of times anywhere in the program.

Function Call

Whenever we want to call a function, we put the name of the function followed by parenthesis as follows:

func1() → This is called function call.

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function Definition:

The part containing the exact set of instructions which are execute during the function call.

Quick Quize: Write a program to greet a user with "Good morning" using function.

Types of function in python

There are types of function in python.

1] Build in function ——→ (Already present)
2] User Define function ——→ (Define by user)

Example of build in function includes len() print(), range() etc.

The func1() function we defined is an example of user define function.

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function with Arguments:

A function can accept some value it can work with. We can put these values in the parenthesis a function can also return values shows below.

```
def greet(name):
        gr = "Hello" + name
        return gr
                    → "Tejas" is passed to greet in
a = greet("Tejas")
                  → A will now contain
                        "Hello Tejas".
```

Depaut parameter Value

We can have a value as depaut arguments in a function.

If we specify name = "stranger" in the line containing dep. this value is used when no argument is passed.

Example:

```
def greet(name = "Stranger"):
        #function body
```

greet() → Name will be "stranger" in function body (default).

greet("Tejas") → Name will be "Tejas" in function body (passed)

Recursion

Recursion is a function which calls function, itself.

It is used to directly use a mathematical formula as a function. for Example.

factorial(n) = n × factorial(n-1)

This function Define as follows.

```
def factorial(n):
    if i == 0 or i == 1:
        return 0
    else:
        return n*factorial(n-1)
```

Base Condition which doesn't call the function any further

function calling itself

The works as follows.

factorial(4)

4 x function(3)
4 x [3 x factorial(2)]
4 x 3 x [2 x factorial(1)]
4 x 3 x 2 x [1] [function returned]

The programmer need to be extremely careful while working with recursion to ensure that the function doesn't infinite keep calling itself.
Recursion is sometimes the most direct way to code algorithms.

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Practice Set

1. Write a program using function to find greatest of three Numbers.

2. Write a python program using function to Convert Celcious to Fherinhite.

3. How do you prevent a python print() function to print a new line at the end.

4. Write a recursive function to calculate the sum of first n natural number.

5. Write a python function to print first n lines of the following pattern.

```
* * *
* *
*
```

→ for n = 3

6. Write a python program which Convert inches to cms.

7. Write a python function to remove a given from a list & strip it all same time.

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8. Write a python function to print multiplication table of given Number.