The Functions in Python

1. Definition
A function is a reusable block of code that performs a specific task.

2. Syntax

```
def function_name(parameters):
    # code block
    return value
```

- def: keyword to define a function
- function_name: the name of a function
- parameters: input
- return: sends back a result (optional)

3. Calling a Function

Syntax

```
function_name(arguments)
```

Example 1

Without Using Function

```
# First number
n1 = int(input("Enter a number: "))
square1 = n1 * n1
print("Square =", square1)

# Second number
n2 = int(input("\nEnter another number: "))
square2 = n2 * n2
print("Square =", square2)

# Third number
n3 = int(input("\nEnter another number: "))
square3 = n3 * n3
print("Square =", square3)
```

With Function

```
def square(number):
    return number * number

Number1 = float(input("enter your first number: "))
Number2 = float(input("enter your second number: "))

Square1 = square(Number1)
Square2 = square(Number2)

print(Square1, " ", Square2)
```

Example 2

```
def greet(name):
    print("Hello", name)

# Calling the function
greet("Ali")
greet("Sara")
```

Output:

```
Hello Ali
Hello Sara
```

4. Function Returns Multiple Values

Syntax

```
def function_name(parameters):
    # code block
    return value1, value2, ...
```

Example

```
def operations(a, b):
    sum = a + b
    diff = a - b
    product = a * b
    return sum, diff, product

# Calling the function and unpacking the return values
x, y, z = operations(5, 3)
print("Sum =", x, "Difference =", y, "Product =", z)
```

5. Global and Local Variable

Global Variable:
A variable defined outside of all functions, accessible anywhere in the program.

Local Variable:
A variable defined inside a function, accessible only inside that function.

Example
```
# Global variable
x = 10

def my_function():
    x = 5  # local variable
    print("Inside function, x =", x)

print("Before function call, x =", x)
my_function()
print("After function call, x =", x)
```

Output:

```
Before function call, x = 10
Inside function, x = 5
After function call, x = 10
```