What is the purpose of return statement in python Functions? What happens if a function does not have a returned statement?

The return statement in Python functions is used to send a value back to the caller of the function. It terminates the function's execution and specifies the result of the function.

- **With a return statement**: The function returns the specified value or object.
- **Without a return statement**: The function returns None by default.

What is the difference between global and local variables?

Global Variables: Declared outside of any function and accessible throughout the program, including inside functions (if not shadowed by a local variable).

Local Variables: Declared inside a function and accessible only within that function. They exist only during the function's execution.

What is recursive function?

A **recursive function** is a function that calls itself directly or indirectly to solve a problem. It breaks the problem into smaller sub-problems, with each recursive call moving closer to a base case, which stops the recursion.

Key Components:

1. **Base Case**: The condition where recursion stops.
2. **Recursive Case**: The part of the function where it calls itself.

Example:

```
def factorial(n):
  if n == 1:  # Base case
    return 1
  else:
    return n * factorial(n - 1)  # Recursive case
```

Here, factorial(5) computes 5 * factorial(4), and so on, until it reaches the base case factorial(1).

What is a lambda function in python?

A **lambda function** in Python is a small, anonymous function defined using the lambda keyword. It can have any number of arguments but only one expression, which is evaluated and returned.

Syntax:

lambda arguments: expression

Example:

```
add = lambda x, y: x + y

print(add(5, 3))  # Output: 8
```

Key Features:

- Concise and often used for short, throwaway functions.
- Commonly used in functions like map(), filter(), and sorted() for quick operations.