Assignment 4

Python Functions

1. What does the len() function do in Python? Write a code example using len() to find the length of a list.

    - The len() function in Python is used to determine the number of items in an object. This could be the number of elements in a list, the number of characters in a string or the number of keys in a dictionary.

```
l = [10, 20, 30, 40, 50]
length = len(l)
print("Length is: ",length)
```

```
Length is:  5
```

2. Write a Python function greet(name) that takes a person's name as input and prints "Hello, [name]!".

```
#2) Greet()
def greet():
    name=input("Enter your name: ")
    print("Hello", name)
greet()
```

```
Enter your name: Anju
Hello Anju
```

3. Write a Python function find_maximum(numbers) that takes a list of integers and returns the maximum value without using the built-in max() function. Use a loop to iterate through the list and compare values.

```
# 3) Max()
numbers = [3, 1, 7, 2, 5]
def find_maximum(numbers):
    maximum = numbers[0]
    for num in numbers:
        if num > maximum:
            maximum = num
    return maximum
result = find_maximum(numbers)
print("The maximum value is:", result)
```

```
The maximum value is: 7
```

4. Explain the difference between local and global variables in a Python function. Write a program where a global variable and a local variable have the same name and show how Python differentiates between them.

Difference Between Local and Global Variables:

1. **Local Variables:**
    - Defined inside a function.
    - Their scope is limited to the function where they are defined.
    - They are created when the function is called and destroyed when the function ends.
2. **Global Variables:**
    - Defined outside all functions and have a global scope.
    - Can be accessed and modified inside a function using the global keyword.
    - They exist throughout the program's execution.

```
# 4) Local and global variables
# Local Variables:
# ================
# *Defined inside a function.
# *Their scope is limited to the function where they are defined.
# *They are created when the function is called and destroyed when the
#  function ends.

# Global Variables:
# ==================
# *Defined outside all functions and have a global scope.
# *Can be accessed and modified inside a function using the global keyword.
# *They exist throughout the program's execution.

a = 1000 # global variable

def verify():
    a = 200 # local variable
    print("Local variable is:", a)

verify()

print("Global variable is:", a)
```

```
Local variable is: 200
Global variable is: 1000
```

5. Create a function calculate_area(length, width=5) that calculates the area of a rectangle. If only the length is provided, the function should assume the width is 5. Show how the function behaves when called with and without the width argument.

```python
# 5) Area()
def calculate_area(length, width=5):
    return length * width

area_with_width = calculate_area(50,3)
print("Area with both length and width given:", area_with_width)

area_without_width = calculate_area(50)
print("Area with only length given: ", area_without_width)
```

```
Area with both length and width given: 150
Area with only length given:  250
```