Purwadhika Digital Technology School

Python Basic Exercise #7

Total Question: **11 Question**
Topic: **Function, Variable Scope, Recursive, lambda**

Task 1 - Basic Function

```
# Write a function that takes two parameters (a and b) and returns their sum.
# Test the function with different values and print the results.
```

Task 2 - Function and Default Parameter

```
# Create a function that takes two parameters (name and greeting) and prints a personalized greeting.
# Provide a default value for the greeting parameter.
# Test the function with different names and greetings.
```

Task 3 - Global and Local Variables

```
# Create a global variable outside a function.
# Create a function that uses the global variable and another variable local to the function.
# Print both variables inside the function.
# Test the function and print the values of both variables.
```

Task 4 - Recursive Function

```
# Create a recursive function to calculate the factorial of a number.
# Test the function with different numbers and print the results.
```

Task 5 - Callback Function

```
# Write a function that takes a list of numbers and a callback function.
# Apply the callback function to each element in the list and return the results.
# Define a callback function that squares a number and test it with the main function.
```

Task 6 - Lambda Expressions

```
# Rewrite the callback function from the previous exercise using a lambda expression.
# Test the main function with the lambda expression.
```

Task 7 - Data Science Task with Functions

```
# Create a function that calculates the average of a list of numbers.
# Create another function that filters out numbers below a certain threshold from a list.
# Test both functions on a list of numeric data.
# Combine the two functions to calculate the average of numbers above a certain threshold.
```

Task 8 - Recursive Function with Memoization

```
# Enhance the factorial function from the previous exercise using memoization.
# Use a global dictionary to store previously calculated factorial values.
# Print the result and the memoization dictionary for different inputs.
```

Task 9 - Data Science Task with Functions #2

```
# Create a function that calculates the average of a list of numbers.
# Create another function that filters out numbers below a certain threshold from a list.
# Test both functions on a list of numeric data.
# Combine the two functions to calculate the average of numbers above a certain threshold.
```

Task 10 - Callback Function and Filtering

```
# Write a function that takes a list of numbers and a callback function.
# Apply the callback function to each element and return a new list containing only the elements that meet a
# Define a callback function that checks if a number is greater than 5 and test it with the main function.
```

Task 11 - Lambda Expressions with Sorting

```
# Create a list of tuples where each tuple represents a person with their name and age.
# Use the sorted() function with a lambda expression to sort the list based on age.
# Print the sorted list.
```