

# Task 3

## Python Tasks and Expected Outputs

**Upload .py or Ipy nb extension file on github public repo “100DaysofBytewise” and share the link in the submission form by 13 June 2024**

### 1. Recursive Factorial

- Write a recursive function to calculate the factorial of a given number.
- Expected output: If the input is 5, the output should be "The factorial of 5 is 120."

### 2. Palindrome Linked List

- Write a program to determine if a given linked list is a palindrome.
- Expected output: If the linked list is `1 -> 2 -> 3 -> 2 -> 1`, the output should be "The linked list is a palindrome." If the linked list is `1 -> 2 -> 3 -> 4 -> 5`, the output should be "The linked list is not a palindrome."

### 3. Merge Sorted Arrays

- Write a function that takes two sorted arrays and merges them into a single sorted array.
- Expected output: If the two input arrays are `[1, 3, 5]` and `[2, 4, 6]`, the output should be `[1, 2, 3, 4, 5, 6]`.

### 4. Binary Search Tree

- Implement a Binary Search Tree (BST) data structure, including methods for insertion, deletion, and search.
- Expected output: The program should be able to perform various BST operations and print the results.

### 5. Longest Palindromic Substring

- Write a program to find the longest palindromic substring within a given string.
- Expected output: If the input string is "babad", the output should be "bab" or "aba". If the input string is "cbdd", the output should be "bb".

### 6. Merge Intervals

- Write a program to merge overlapping intervals in a list of intervals.
- Expected output: If the input is `[(1, 3), (2, 6), (8, 10), (15, 18)]`, the output should be `[(1, 6), (8, 10), (15, 18)]`.

### 7. Maximum Subarray

- Write a program to find the maximum sum of a contiguous subarray within a given array.
- Expected output: If the input array is `[-2, 1, -3, 4, -1, 2, 1, -5, 4]`, the output should be `6`, as the maximum subarray is `[4, -1, 2, 1]`.

### 8. Reverse Linked List

- Write a program to reverse a singly-linked list.
- Expected output: If the input linked list is `1 -> 2 -> 3 -> 4 -> 5`, the output should be `5 -> 4 -> 3 -> 2 -> 1`.

#### 9. Minimum Edit Distance

- Write a program to calculate the minimum number of operations (insertions, deletions, or substitutions) required to transform one string into another.
- Expected output: If the two input strings are "kitten" and "sitting", the output should be `3`.

#### 10. Boggle Game

- Implement a program that solves the Boggle game, given a board and a list of words.
- Expected output: The program should print all the words found in the Boggle board.