Assignment 10

1. Find a list of 20 numbers and create a new list that contains only the numbers that are divisible by 3. Then, sort this new list in ascending order.

2. Write a program to calculate the factorial of a given number. Test your program with the number 5.

3. In the following code, correct the error and make the program produce the output: 100.
   ```python
   x = 5
   y = 20
   print(x + y)
   ```

4. Write a function that takes a list of numbers and returns a new list containing only the even numbers. Test your function with a list of your choice.

5. Implement a method to rotate a list by a given number of positions. Test your method with a list of 10 elements and the rotation value as 3.

6. Create a program that generates a list of prime numbers within a given range, say 1 to 100.

7. Write a program to find all the subsets of a given list.

8. Given a list of words, write a program to find the longest word in the list. If there are multiple words with the same length, return any one of them.

9. Create a program that checks if a given string is a palindrome. Test your program with a string of your choice.

10. Implement a class to represent a stack data structure. Test the class with push and pop operations.