**MANAV RACHNA UNIVERSITY**

**AIML SUPERVISED LEARNING 3rd SEM**

**ASSIGNMENT 1**

**1. Fibonacci Sequence**

Write a function to generate the first n Fibonacci numbers using a loop. For example, if n = 6, the output should be [0, 1, 1, 2, 3, 5].

**2. Factorial Calculation**

Write a function to compute the factorial of a given number using a loop. For example, factorial(5) should return 120.

**3. Sum of Digits**

Write a function that takes an integer and returns the sum of its digits. For example, for the number 1234, the output should be 10 (1 + 2 + 3 + 4).

**4. Prime Number Check**

Write a function to check if a given number is prime using a loop. For example, is\_prime(29) should return True, and is\_prime(10) should return False.

**5. Reverse a String**

Write a function to reverse a given string using a loop. For example, for the input "hello", the output should be "olleh".

**6. Palindrome Check**

Write a function to check if a given string is a palindrome using a loop. For example, "madam" is a palindrome.

**7. Print Multiplication Table**

Write a function that prints the multiplication table for a given number n up to 10.

**8. Find the Largest Number in a List**

Write a function that finds the largest number in a list using a loop. For example, given [4, 7, 1, 8, 3], the output should be 8.

**10. Print a Pattern**

Write a function that prints a pattern of stars based on the number of rows provided. For example, if rows = 5, the output should be:

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**11. Even and Odd Numbers**

Write a function that takes a list of integers and returns two lists: one containing all the even numbers and the other containing all the odd numbers.

**12. Count Vowels and Consonants**

Write a function that takes a string and returns the count of vowels and consonants. For example, for the input "hello world", the output should be {'vowels': 3, 'consonants': 7}.

**13. Number Pattern**

Write a function that prints a number pattern based on a given integer n. For example, for n = 4, the output should be:

1

22

333

4444

**14. Multiples of a Number**

Write a function that prints all multiples of a given number up to a specified limit. For example, for num = 3 and limit = 20, the output should be 3, 6, 9, 12, 15, 18.

**15. Sum of Even and Odd Numbers in a List**

Write a function that takes a list of integers and returns a tuple with the sum of even numbers and the sum of odd numbers. For example, for the list [1, 2, 3, 4, 5, 6], the output should be (12, 9).