**Lab 1: Warm-up exercises from Python bridge course**

**Problem 1**: Write a program to ask a user to input a positive number ‘x’ in the range (0 < x < 20) and print the following at the output

1. The number is even or odd (use the modulo operator)
2. The sum of all numbers from 0 to the given number (implement using ‘for loop’)
3. The sum of all the digits of the number (use a while loop)
4. Create a list of numbers from 0 to the given number and print it
5. In the list created in part ‘d’ replace all numbers divisible by 3 with a 0.

Modularize the above code by creating a separate function for each part (a – e)

Is it possible to solve any of the above parts using Recursion? Demonstrate using recursion implementation.

**Problem 2**: Write a function to check whether a year is a leap year or not. The program should ask the user to input a year and the output should be of the form- {user input year} is/ is not a leap year.

These are the conditions for a leap year:

* A year divisible by 400 is a leap year
* A year divisible by 100 but not by 400 is not a leap year
* A year divisible by 4 but does not meet the above condition is a leap year.

**Problem 3**: Create a program that will ask the user to input a string and checks whether the given string is either a palindrome or not.

**Note:** A palindrome is a sequence of units (numbers, letters etc) that reads the same from left to right and right to left. E.g.: madam

**Problem 4**: Write a program that asks a user to input 2 words and perform the following operations:

1. Convert each word into a ‘list’ of alphabets that constitute the word.
2. Create and print a list that is (i) the union of the above two and (ii) is the intersection of the above two lists
3. Take the union list and sort it so that that all the lowercase characters come first and then the upper case
4. Sort the list in part ‘c’ in alphabetical order