Programming 1: Lab 10 : Functions

1. An *anagram* of a word or phrase is another word or phrase that uses the same letters with the same frequency. Punctuation marks, case, and spaces are ignored. Some examples of anagram pairs are “angered”/“enraged” and “A gentleman”/“Elegant man”. Write a program that requests two words or phrases as input and determines if they are anagrams of each other. The program should use a Boolean-valued function with header
   def areAnagrams(string1, string2):
   that returns **True** when the two strings are anagrams, and otherwise returns **False**.
2. The following words have three consecutive letters that are also consecutive letters in the alphabet: THI**RST**Y, **NOP**E, A**FGH**ANISTAN, **STU**DENT.
   Write a program that accepts a word as input and determines whether or not it has three consecutive letters that are consecutive letters in the alphabet. The program should use a Boolean-valued function named *isTripleConsecutive* that accepts an entire word as input.
   Hint: Use the **ord** function.
3. Given a list of N numbers, write a function to shift the numbers circularly by some integer k (where k < N). The function should take a list and k as arguments and return the shifted list.
   1. Write a function that assumes shifting is to the left.
   2. Write a function that takes a third argument that specifies shifting left or right.
   Hint:
   original list: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
   shifted by 4, to the left: [4, 5, 6, 7, 8, 9, 0, 1, 2, 3]
   shifted by 4, to the right: [6, 7, 8, 9, 0, 1, 2, 3, 4, 5]
4. You’ve decided to program a simple calculator. Your calculator can perform the following operations:
   (a) It can add two numbers.
   (b) It can subtract one number from another.
   (c) It can multiply two numbers.
   (d) It can divide one number by another.
   Write a function that asks the user for two numbers, and the operation they wish to perform on these two integers, and return the result. ***Note:*** Choices should be entered as strings.
5. Write a function that takes in the lower and upper limits of a range, and prints all the prime numbers in that range. The function returns the sum of all primes in that range.
6. Write a function that takes as input a string that stores date and time (24-hour clock) in the following format:
   “MM/DD/YYYY HR:MIN:SEC” and prints the following:
   - DD/MM/YYYY
   - HR:MIN:SEC
   - MM/YYYY
   - Whether the time is “AM” or “PM”.

   Validation of the input in the function is necessary. For example, if the user gives an input of “122/04/1990 13:12:12”, the given string is invalid, as there can be only 12 months in a year. Think of all possible erroneous inputs and write code to handle them. The function doesn’t return anything.
7. Write recursive functions for the following:
   i. Find the factorial of an input positive integer.
   ii. Find the sum of first N positive integers.
   iii. Display the Fibonacci series till N terms.