Assignment 6_2021 batch

1. Define a function which takes n as an argument and evaluates

$$g(n) = \sum_{i=1}^{n} \frac{i}{i+1}$$

Print the values of g(n) for n = 1 to 20.

2. Define a function which calculates the factorial of a given number. Show the usage of the function by calculating the factorials from n=1 to 8.

3. If you need to evaluate mathematical operations (log, sin, cos etc), you need to declare from math import * at the beginning of your program. For example, to find the value of cosine of 60°, your program should look like:

from math import *

print cos(60*pi/180)

pi gives you the value of π and θπ/180 converts θ from degree to radian.

Define a function which takes an argument t and returns sin 2t. Next write a loop which uses the function to print θ, sin 2θ for θ = 0, 10, 20, 30, . . . , 80, 90.

4. Write a program to take a line of text as input; decipher the text by interchanging the odd positions characters with the even position characters.

Input: Enter a text: Satyajit Ray
Output: The result is: aSytjatiR ya
Input: Enter a text: Covid19 Vaccine
Output: The result is: oCiv1d 9aVccnie

5. Write a program that takes a string as input and removes what is inside the brackets.
Input: Enter a string: Indian Statistical Institute (ISI) is a public research university.
Output: Indian Statistical Institute is a public research university.

6. Write a program that takes an integer N and then would take N positive integers as input into a list. Then count the number of even and odd numbers from a series of numbers.

Input:
Enter an integer: 9
Enter value 1: 2
Enter value 2: 4
Enter value 3: 7
Enter value 4: 1

Enter value 5: 3
Enter value 6: 8
Enter value 7: 7
Enter value 8: 9
Enter value 9: 5
Output:
Number of even numbers: 3
Number of odd numbers: 6

7. Write a program to find the sum of the following series, given an integer n: 3 + 33 + 333 + 3333 + ... upto n terms.

Input: Enter an integer: 6
Output: The result is: 370368
Input: Enter an integer: 9
Output: The result is: 370370367

8. A strong number where the sum of the factorials of the digits making up the number is the number itself. Example:145=1!+4!+5!. Write a program to generate all strong numbers between 1 and 100,000.

9. Challenge program: (This will not be marked and is for practice only)
1st January 1900 was a Monday. Considering that as a base, write a program to find out the day of a given date.

Input:
Enter year: 2021
Enter month: 2
Enter date: 15
Output: It was a Monday.