PDS Lab 3
Section 3
Date: 22.04.2021

Tutorial 1

Write a C program to take as input a floating point number x and a positive integer n, and compute the following series sum:

$$e^x = 1 + x/1! + x^2/2! + x^3/3! + ...$$

In the end, print the value of n, and of e^x upto n terms in the series sum.

Let the nth term be t_n, and the sum up to the nth term be S_n. are defined inductively as follows:

$t_n = 1$ if n = 0;

$= x . t_{n-1}/n$ if n > 0

$S_n = t_0$ if n = 0;

$= S_{n-1} + t_n$ if n > 0.

Tutorial 2

Write a C program which takes as input a positive integer n, checks whether n is a prime number or not, and prints the result.

Question 1

Write a C program to compute the sine of an angle, sin(x) using the following
    sine infinite series:
$$sin(x) = x - x^3/3! + x^5/5! - x^7/7! + ...;$$
where x is taken as input in radian.
Write a main program which reads three different values of x and an integer n
    (number of terms) from the keyboard.
The program then computes sin(x) upto n terms for all 3 input values of x, and
    prints the value of n, the three results and the corresponding x values.

You CANNOT use a for loop for this program.

Question 2

Write a C program which reads a natural number n and prints whether the given number is perfect or not.

Definition: A number is said to be **perfect** if it is equal to the sum of all its factors including 1 (but excluding itself).

For Example,

6 = 1 + 2 + 3,

28 = 1 + 2 + 4 + 7 + 14 are perfect and

12 (factors = 1, 2, 3, 4, 6) is not perfect.

Question 3

Write a C program that
(a) reads a natural number n from keyboard
(b) checks if n is prime or not and prints accordingly.
(c) finds and prints all the twin prime pairs both of which are
    less than or equal to n.

Definition: A prime number is part of a twin prime pair if it is
    either 2 less or 2 more than another prime number.
Eg: (41, 43) is one twin prime pair.