Computing Sin(x)

ZPRAC-16-17-Lab7

[20 Points]
Computing Sine using Maclaurin series

ANNOUNCEMENT: Up to 20% marks will be allotted for good programming practice. These include
- Comments for non trivial code
- Indentation: align your code properly
- Use of Functions: Complete the provided code to perform the given task. Fill the function computeSine().

Write a C program to find the value of |Sin(x)| using up to n terms of the following series where n is given in input. |Sin(x)| here means absolute value of Sin(x).

Sin(x) = x - $x^3/3!$ + $x^5/5!$ - .....

Here, (a!) refers to factorial of a, term1 is x, term2 is $x^3/3!$, and so on..

To prevent the overflows during the computations, the series should be computed as the following:

Sin(x) = x - (x/1)*(x/2)*(x/3) + (x/1)*(x/2)*(x/3)*(x/4)*(x/5) - .....

Input:
Input contains a decimal number which denotes the value of x in degrees and an integer n which denotes the number of terms to be used in series.

Output:
The value of |Sin(x)| computed from the series rounded off till 3rd decimal place.

Example:

Input:
225 10
Output:
0.707

Constraints :
0 <= x < 360
1 <= n < 20

Comments:
1. Note that for the above mentioned series to work, the value of x should be in radians but the input x is in degrees. Use the following equation for the conversion from degrees to radians
x_in_radians = x_in_degrees * (3.142 / 180)
2. You are not allowed to use functions in math.h or any other algorithm to compute the value of Sin(x). You will only be graded if you stick to the above mentioned algorithm for computation.
3. Use floats during the computations to store the decimal numbers
4. Strictly stick to the above mentioned series otherwise the answers would not match