

EXPERIMENT NO: 9

TITLE: Develop a program to compute Sin(x) using Taylor series approximation. Compare your result with the built-in Library function. Print both the results with appropriate messages.

PROGRAM:

```
#include<stdio.h>
#include<math.h>
#define PI 3.141593

void main()
{
    int i, degree;
    float rad, sum=0,term,nume,deno;

    printf("Enter the degree\n");
    scanf("%d",&degree);

    rad=degree*(PI/180);
    nume=rad;
    deno=1;
    i=2;
    do
    {
        term=nume/deno;
        nume=-nume*rad*rad;
        deno=deno*i*(i+1);
        sum=sum+term; i=i+2;
    }while(fabs(term)>=0.00001);

    printf("The calculated sine value is = %f\n", sum);
    printf("The value using library function is= %f", sin(rad));
}
```

OUTPUTS:

- Enter the value in degree
30
The calculated sine value is = 0.500000
The value using library function is = 0.500000
- Enter a value in degree
90
The calculated sine value is =1.000000
The value using library function is = 1.000000
- Enter a value in degree
120
The calculated sine value is = 0.866025
The value using library function is = 0.866025

ALGORITHM:

STEP 1: Start

STEP 2: Assign **PI = 3.1415927**

STEP 3: Read degree

STEP 4: Convert degree to radian

rad = degree * (PI / 180)

STEP 5: Initialize

nume = rad

deno = 1

i = 2

sum = 0

STEP 6: Repeat

term = nume / deno

nume = -nume * rad * rad

deno = deno * i * (i + 1)

sum = sum + term

i = i + 2

STEP 7: until (**|term|**) **>= 0.00001**

STEP 8: display **sum, sin(rad)**

STEP 9: Stop

FLOWCHART:

