Q:20:: Write a c++ program that evaluate the following series :

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots$$

Answer: code link

```
#include<iostream>
#include<math.h>
#include<iomanip>
using namespace std;
float dg_rd(float x){
    x=x*(M_PI/180);
    return x;}
int factorial(int f){
    int temp=1,j=2;
    while(j<=f){
        temp=temp*j;
        j++;}
    return temp;}
int main(){
    int i,sign,k=1,f,n;
    float x,x1,x2,sum=0.0,term;
    cout<<"Enter an angle in degree : ";
    cin>>x1;
    x2=x1;
    x=dg_rd(x2);
    cout<<"Enter the nth term : ";
    cin>>n;
    for(i=1;;i=i+2){
       if(k%2==0)
           sign=-1;
       else
           sign=1;
       f=factorial(i);
       term=(pow(x,i))/f;
       sum=sum+(sign*term);
       if(k==n)
        break;
       f=0;
       term=0.0;
       k++;}
    std::cout<<std::setprecision(6)<<"sin( "<<x1<<" ) : "<<sum<<endl;
    return 0;}
```

```
Enter an angle in degree : 120
Enter the nth term : 6
sin( 120 ) : 0.866023
```

Q:20:: Write a c++ program that evaluate the following series :

$$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + ...$$

Answer: [code link]

```
#include<iostream>
#include<math.h>
#include<iomanip>
using namespace std;
float dg_rd(float x){
    x=x*(M_PI/180);
    return x;}
int factorial(int f){
    int temp=1,j=2;
    while(j<=f){
        temp=temp*j;
        j++;}
    return temp;}
int main(){
    int i,sign,k=1,f,n;
    float x,x1,x2,sum=0.0,term;
    cout<<"Enter an angle in degree : ";
    cin>>x1;
    x2=x1;
    x=dg_rd(x2);
    cout<<"Enter the nth term : ";
    cin>>n;
    for(i=0;;i=i+2){
       if(k%2==0)
           sign=-1;
       else
           sign=1;
       f=factorial(i);
       term=(pow(x,i))/f;
       sum=sum+(sign*term);
       if(k==n)
        break;
       f=0;
       term=0.0;
       k++;}
    std::cout<<std::setprecision(6)<<"cos( "<<x1<<" ) : "<<sum<<endl;
    return 0;}
```

```
Enter an angle in degree : 120
Enter the nth term : 7
cos( 120 ) : -0.5
```