

```

//Simpson's 1/3rd Rule for Evaluation of Definite Integrals
#include<iostream>
#include<cmath>
using namespace std;
double f(double x)
{
    double a=1/(1+x*x);    //write the function whose definite integral is to be
    calculated here
    return a;
}
int main()
{
    cout.precision(4);        //set the precision
    cout.setf(ios::fixed);
    int n,i;                //n is for subintervals and i is for loop
    double a,b,c,h,sum=0,integral;
    cout<<"\nEnter the limits of integration,\n\nInitial limit,a= ";
    cin>>a;
    cout<<"\nFinal limit, b=";                //get the limits of integration
    cin>>b;
    cout<<"\nEnter the no. of subintervals(IT SHOULD BE EVEN), \nn=";                //get the
no. of subintervals
    cin>>n;
    double x[n+1],y[n+1];
    h=(b-a)/n;                //get the width of the subintervals
    for (i=0;i<n+1;i++)
    {
        //loop to evaluate x0,...xn and y0,...yn
        //and store them in arrays
        x[i]=a+i*h;
        y[i]=f(x[i]);
    }
    for (i=1;i<n;i+=2)
    {
        sum=sum+4.0*y[i];                //loop to evaluate 4*(y1+y3+y5+...+yn-1)
    }
    for (i=2;i<n-1;i+=2)
    {
        sum=sum+2.0*y[i];                /*loop to evaluate 4*(y1+y3+y5+...+yn-1)+
2*(y2+y4+y6+...+yn-2)*/
    }
    integral=h/3.0*(y[0]+y[n]+sum);
    //h/3*[y0+yn+4*(y1+y3+y5+...+yn-1)+2*(y2+y4+y6+...+yn-2)]
    cout<<"\nThe definite integral is "<<integral<<"\n"<<endl;
    return 0;
}

```

```
Enter the limits of integration,  
Initial limit,a= 0  
Final limit, b=6  
Enter the no. of subintervals(IT SHOULD BE EVEN),  
n=6  
The definite integral is 1.3662  
manas@manas-VirtualBox:~/NA$
```

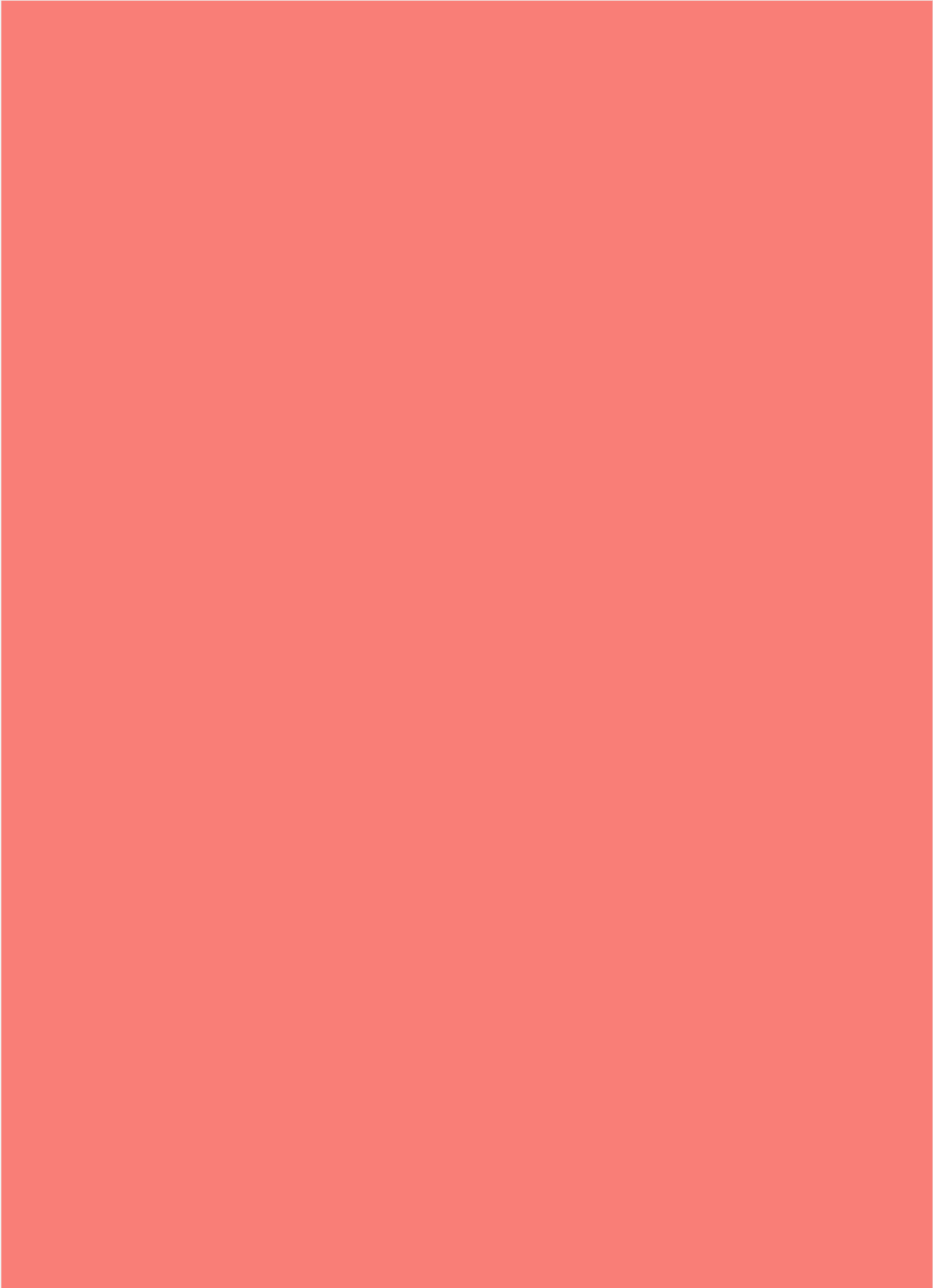
Explanation of the Code:



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I'm a physicist specializing in computational material science with a PhD in Physics from Friedrich-Schiller University Jena, Germany. I write efficient codes for simulating light-matter interactions at atomic scales. I like to develop Physics, DFT, and Machine Learning related apps and software from time to time. Can code in most of the popular languages. I like to share my knowledge in Physics and applications using this Blog and a YouTube channel.

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