

```

1 // Numerical Integration using Trapezoidal Rule
2 // Given Function  $f(x) = 1/(1+x^2)$ 
3
4 #include <stdio.h>
5 #include <stdlib.h>
6 #include <math.h>
7 #include <conio.h>
8
9 //Defining the Integral
10 float f(float x)
11 {
12     float fx= 1/(1+x*x); //  $f(x)=1/(1+x^2)$ 
13     return fx;
14 }
15
16 void trapezoidal(float xMin, float xMax, float n)
17 {
18     int i; //General purpose initializer
19     float h = (xMax-xMin)/n; // h = step size
20     float area, marginal_sections_area, middle_sections_area=0;
21
22     for(i=1; i<n-1; i++)
23     {
24         middle_sections_area = middle_sections_area + f(xMin + i*h);
25     }
26     marginal_sections_area = f(xMin) + f(xMax);
27     area = (h/2)*(marginal_sections_area + 2*middle_sections_area);
28
29     printf("Area between (%f,%f) is : %f",xMin,xMax,area);
30 }
31
32 void main()
33 {
34     printf ("## Numerical Integration using Trapezoidal Rule ##\n\n");
35
36     float xMin, xMax;
37     int n;
38
39     printf ("Please enter the lower limit of x : ");
40     scanf ("%f", &xMin);
41     printf("\nPlease enter the uppper limit of x : ");
42     scanf ("%f", &xMax);
43     printf ("\nPlease enter the total number of sections :");
44     scanf ("%d", &n);
45     printf("\n\n");
46
47     trapezoidal(xMin,xMax,n);
48
49     getch();
50 }

```