Problem solving through Programming In C - Course

Due on 2020-04-16, 23:59 IST

Week-11 Program-02

Write a C program to find \( \int_a^b x^2 dx \) using Trapezoidal rule with 10 segments between \( a \) and \( b \). The values of \( a \) and \( b \) will be taken from test cases.

Sample Test Cases

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-2) (1)</td>
<td>The integral is: 3.045000</td>
</tr>
<tr>
<td>(0) (1)</td>
<td>The integral is: 0.335000</td>
</tr>
<tr>
<td>(1) (3)</td>
<td>The integral is: 8.680000</td>
</tr>
</tbody>
</table>

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Sample solutions (Provided by instructor)

```c
#include<stdio.h>
float func(float x);
int main()
{
  int n=10; //Taking n=10 sub intervals
  float a,b,integral; //integral is the integration result
  scanf("%f","a"); // initial limit taken from test case
  scanf("%f","b"); // Final limit taken from test case
  //Use the printf statement as printf("The integral is: \%0.6f\n",integral);
  int i;
  float h,x, sum=0;
```
if(b>a)
    h=(b-a)/n;
else
    h=-(b-a)/n;
for(i=1;i<n;i++){
    x=a+i*h;
    sum+=func(x);
}
integral=(h/2)*(func(a)+func(b)+2*sum);
printf("The integral is: %0.6f\n",integral);
return 0;
}
float func(float x)
{
    return x*x;
}