## Simpson 1/3 Rule C Program

1. Start

2. Define function f(x)

3. Read lower limit of integration, upper limit of

integration and number of sub interval

4. Calcultae: step size = (upper limit - lower limit)/number of sub interval

5. Set: integration value = f(lower limit) + f(upper limit)

6. Set: i = 1

7. If i > number of sub interval then goto

8. Calculate: k = lower limit + i \* h

9. If i mod 2 =0 then

Integration value = Integration Value + 2\* f(k)

Otherwise

Integration Value = Integration Value + 4 \* f(k)

End If

10. Increment i by 1 i.e. i = i+1 and go to step 7

11. Calculate: Integration value = Integration value \* step size/3

12. Display Integration value as required answer

13. Stop

#**include**<stdio.h>

#**include**<conio.h>

#**include**<math.h>

/\* Define function here \*/

#**define** f(x) 1/(1+x\*x)

**int** main()

{

**float** lower, upper, integration=0.0, stepSize, k;

**int** i, subInterval;

clrscr();

/\* Input \*/

printf("Enter lower limit of integration: ");

scanf("%f", &lower);

printf("Enter upper limit of integration: ");

scanf("%f", &upper);

printf("Enter number of sub intervals: ");

scanf("%d", &subInterval);

/\* Calculation \*/

/\* Finding step size \*/

stepSize = (upper - lower)/subInterval;

/\* Finding Integration Value \*/

integration = f(lower) + f(upper);

**for**(i=1; i<= subInterval-1; i++)

{

k = lower + i\*stepSize;

**if**(i%2==0)

{

integration = integration + 2 \* f(k);

}

**else**

{

integration = integration + 4 \* f(k);

}

}

integration = integration \* stepSize/3;

printf("\nRequired value of integration is: %.3f", integration);

getch();

**return** 0;

}

**Simpson's 3/8 Rule Algorithm**

1. Start

2. Define function f(x)

3. Read lower limit of integration, upper limit of

integration and number of sub interval

4. Calcultae: step size = (upper limit - lower limit)/number of sub interval

5. Set: integration value = f(lower limit) + f(upper limit)

6. Set: i = 1

7. If i > number of sub interval then goto

8. Calculate: k = lower limit + i \* h

9. If i mod 3 =0 then

Integration value = Integration Value + 2\* f(k)

Otherwise

Integration Value = Integration Value + 3 \* f(k)

End If

10. Increment i by 1 i.e. i = i+1 and go to step 7

11. Calculate: Integration value = Integration value \* step size\*3/8

12. Display Integration value as required answer

13. Stop

#**include**<stdio.h>

#**include**<conio.h>

#**include**<math.h>

#**define** f(x) 1/(1+x\*x)

**int** main()

{

**float** lower, upper, integration=0.0, stepSize, k;

**int** i, subInterval;

clrscr();

/\* Input \*/

printf("Enter lower limit of integration: ");

scanf("%f", &lower);

printf("Enter upper limit of integration: ");

scanf("%f", &upper);

printf("Enter number of sub intervals: ");

scanf("%d", &subInterval);

stepSize = (upper - lower)/subInterval;

integration = f(lower) + f(upper);

**for**(i=1; i<= subInterval-1; i++)

{

k = lower + i\*stepSize;

**if**(i%3 == 0)

{

integration = integration + 2 \* f(k);

}

**else**

{

integration = integration + 3 \* f(k);

}

}

integration = integration \* stepSize\*3/8;

printf("\nRequired value of integration is: %.3f", integration);

getch();

**return** 0;

}