Numerical Integration Using Simpson 3/8 Method C Program

C Program for approximating definite integral of a continuous function using **Simpson's 3/8 Rule (Method)**

Simpson 3/8 Rule C Program

```
#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;
```

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```
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%3 == 0)
 {
  integration = integration + 2 * f(k);
 }
 else
```

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```
    {
     integration = integration + 3 * f(k);
    }
  }
  integration = integration * stepSize*3/8;
  printf("\nRequired value of integration is: %.3f", integration);
  getch();
  return 0;
}
```

Simpson's 3/8 C Program Output

```
Enter lower limit of integration: 0
Enter upper limit of integration: 1
Enter number of sub intervals: 12

Required value of integration is: 0.785
```

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