EXPERIMENT - 5

APPLIED MATHEMATICS LAB

Aim

To find the value of a definite integral using
(a) Trapezoidal rule
(b) Simpsons 1/3 rule
(c) Simpsons 3/8 rule.

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4C7

EXPERIMENT – 5

Aim:

To find the value of a definite integral using

(a) Trapezoidal rule

(b) Simpsons 1/3 rule

(c) Simpsons 3/8 rule.

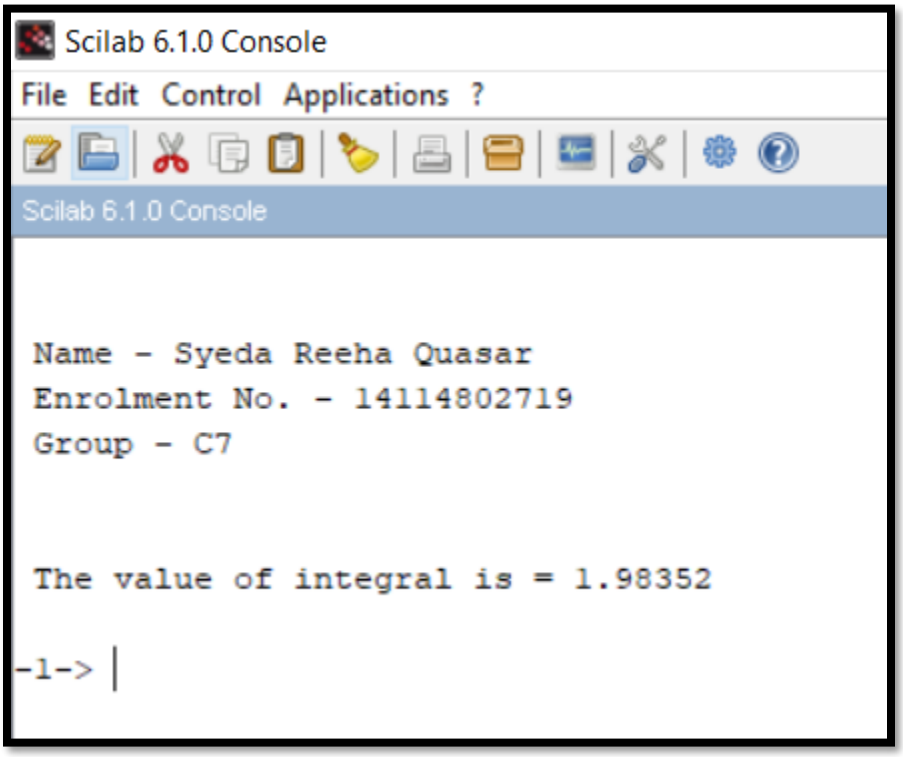
Source Code:

Trapezoidal rule

// Program to find integration by using Trapezoidal rule

```
clc
clear
close

printf('\n\n Name - Syeda Reeha Quasar \n Enrolment No. - 14114802719 \n Group - C7 \n\n')

deff ('y = f(x)', 'y = sin(x)')

x0 = 0
xn = %pi
n = 10
h = (xn - x0)/n
s = 0

for i = 1:n
   s = s + f(x0 + (i - 1)*h) + f(x0 + i * h)
end

integral = (h * s)/2

printf('\n The value of integral is = %g \n', integral)
```

Output:


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
Name - Syeda Reeha Quasar
Enrolment No. - 14114802719
Group - C7
The value of integral is = 1.98352
-1->
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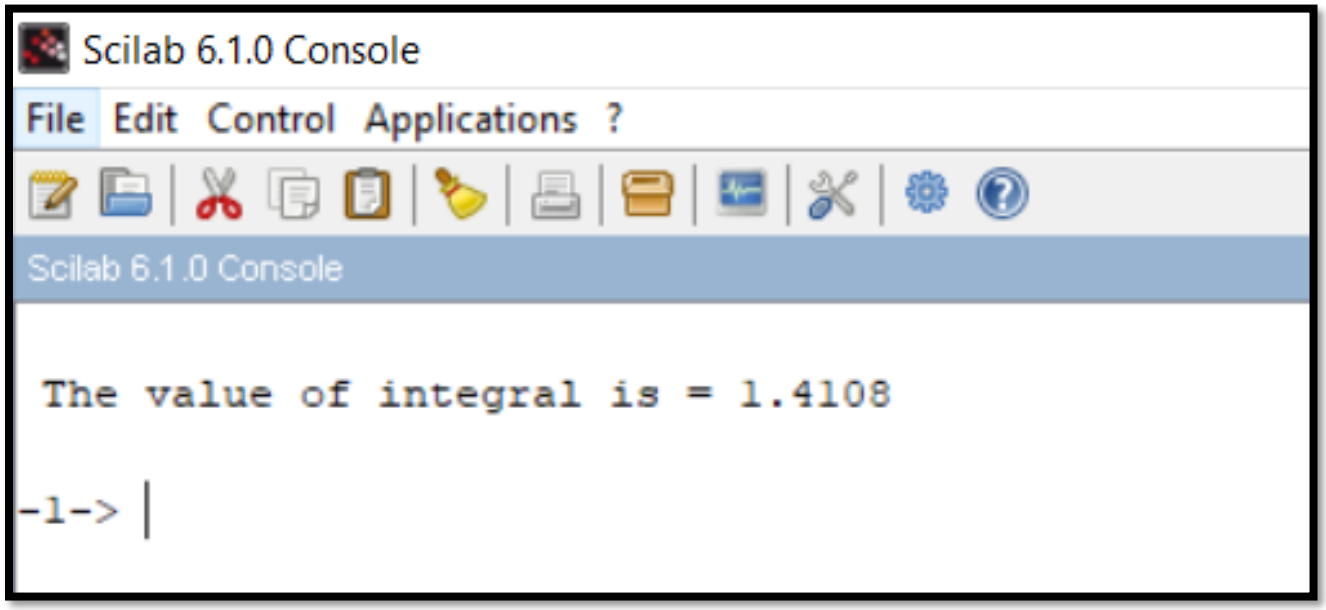
// Program to find integration by using Trapezoidal rule

```
clc
clear
close

deff ('y = f(x)', 'y = 1/(1 + x^2)')

x0 = 0
xn = 6
n = 6
h = (xn - x0)/n
s = 0

for i = 1:n
   s = s + f(x0 + (i - 1)*h) + f(x0 + i * h)
end

integral = (h * s)/2

printf('\n The value of integral is = %g \n', integral)
```

Output:

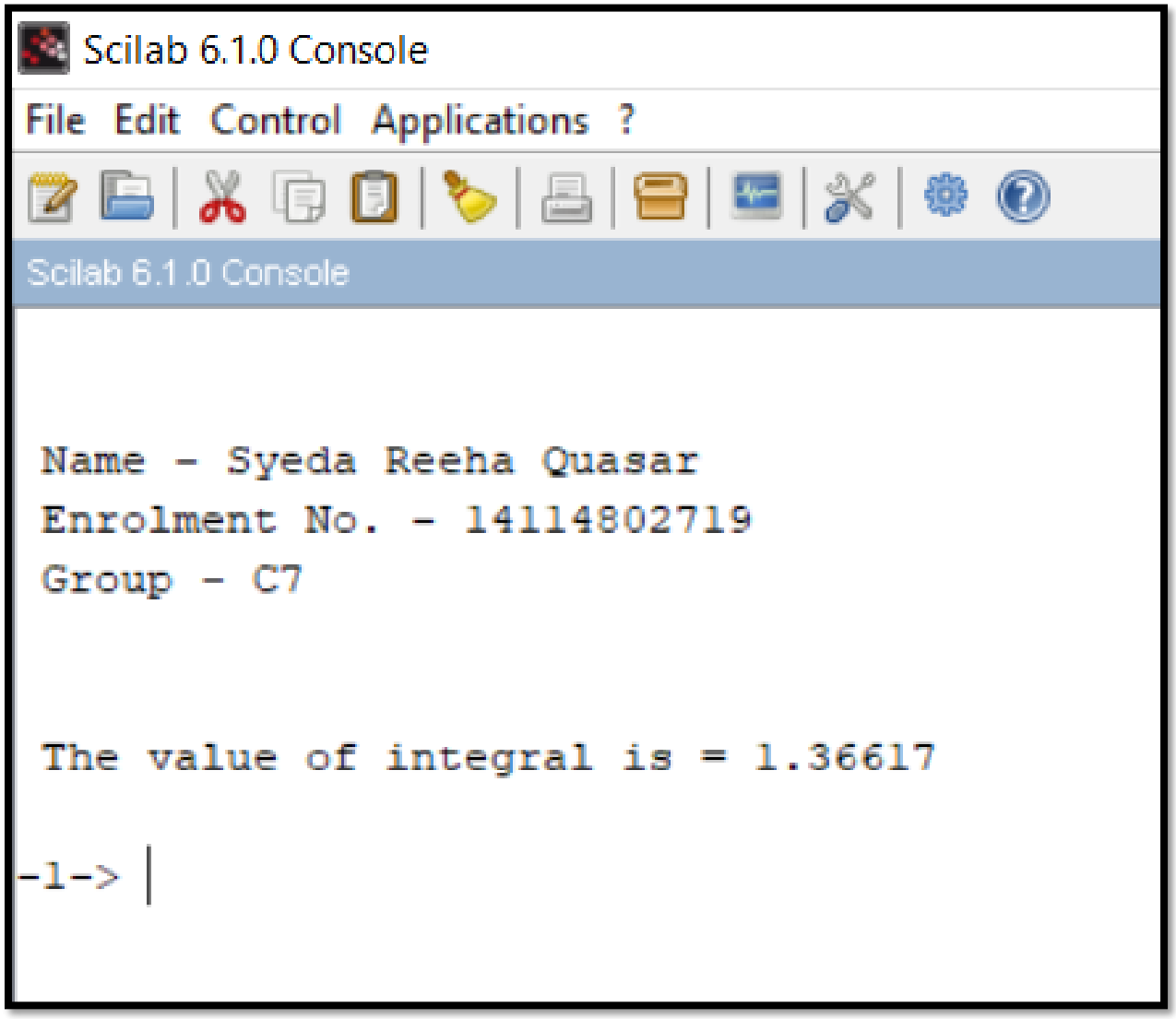

Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
The value of integral is = 1.4108
-1->

Simpsons 1/3 rule

// Program to find integration by using Simpson's 1/3 rule

```
clc
clear
close

printf('\n\n Name - Syeda Reeha Quasar \n Enrolment No. - 14114802719 \n Group - C7 \n\n')

deff ('y = f(x)', 'y = 1/(1 + x^2)')

x0 = 0
xn = 6
n = 6
h = (xn - x0)/n
s = 0

for i = 1:2:n
   s = s + f(x0 + (i - 1)*h) + 4*f(x0 + i * h) + f(x0 + (i+1) * h)
end

integral = (h * s)/3

printf('\n The value of integral is = %g \n', integral)
```

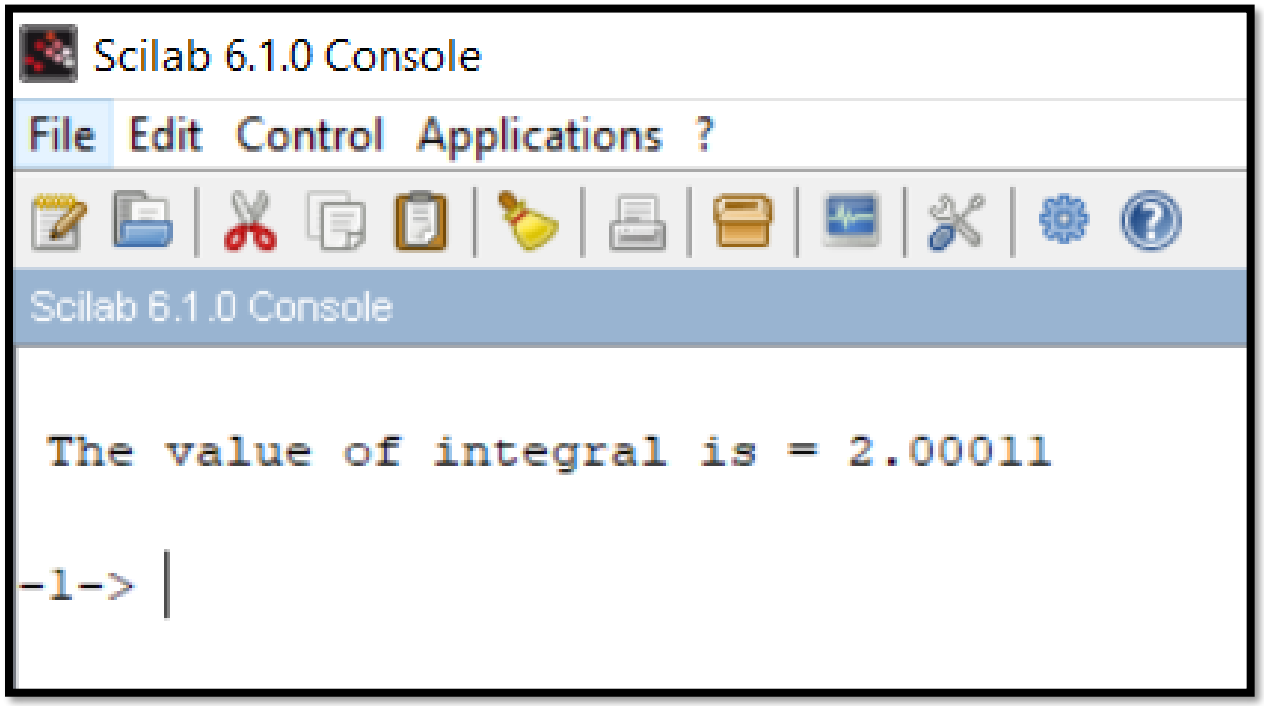
Output:


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
Name - Syeda Reeha Quasar
Enrolment No. - 14114802719
Group - C7
The value of integral is = 1.36617
-1->

// Program to find integration by using Simpson's 1/3 rule

```
clc
clear
close

deff ('y = f(x)', 'y = sin(x)')

x0 = 0
xn = %pi
n = 10
h = (xn - x0)/n
s = 0

for i = 1:2:n
   s = s + f(x0 + (i - 1)*h) + 4*f(x0 + i * h) + f(x0 + (i+1) * h)
end

integral = (h * s)/3

printf('\n The value of integral is = %g \n', integral)
```

Output:

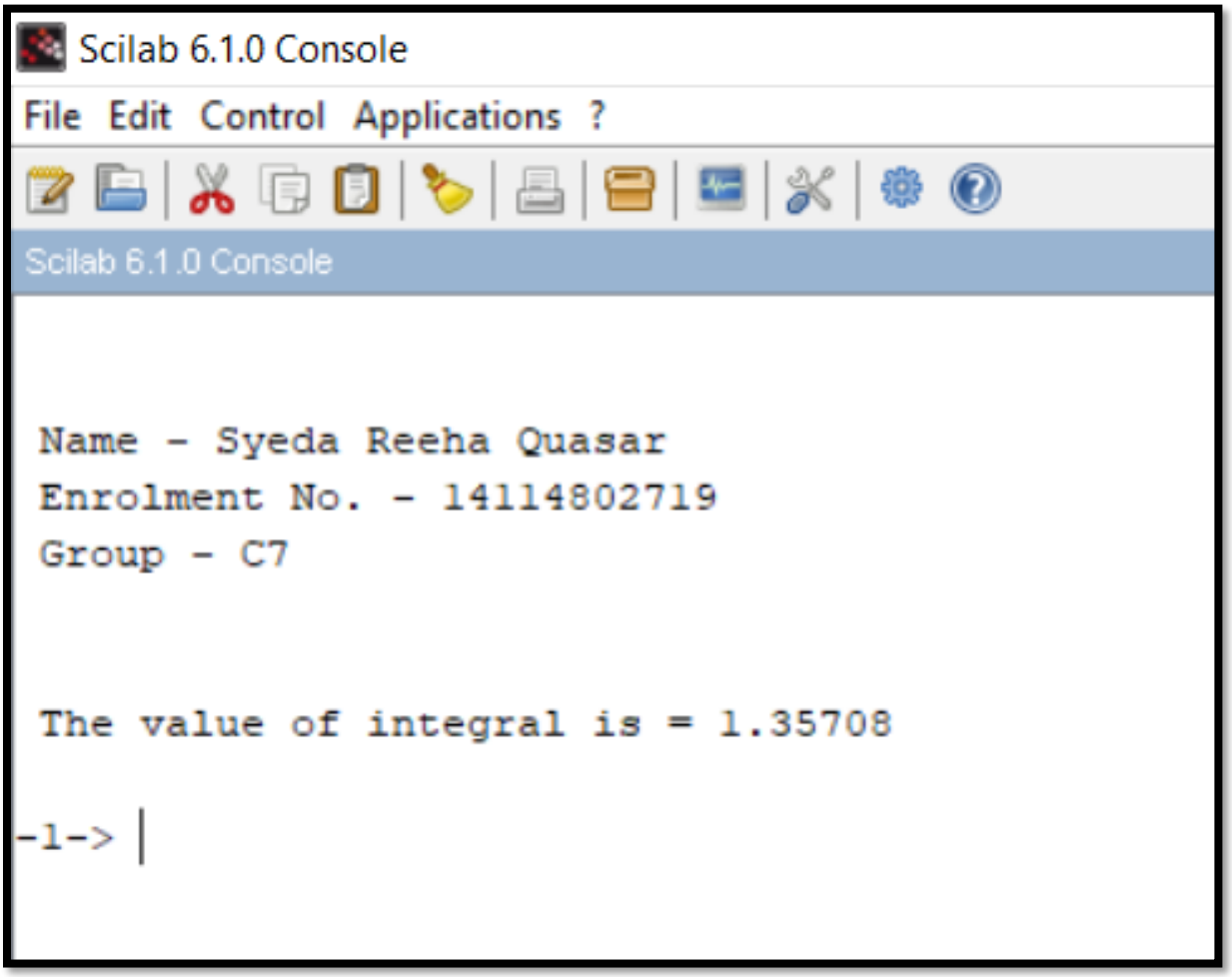

Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
The value of integral is = 2.00011
-1->
Scilab 6.1.0 Console

Simpsons 3/8 rule

// Program to find integration by using Simpson's 3/8 rule

```
clc
clear
close

printf('\n\n Name - Syeda Reeha Quasar \n Enrolment No. - 14114802719 \n Group - C7 \n\n')

deff ('y = f(x)', 'y = 1/(1 + x^2)')

x0 = 0
xn = 6
n = 6
h = (xn - x0)/n
s = 0

for i = 1:3:n
   s = s + f(x0 + (i - 1)*h) + 3*f(x0 + i * h) + 3 * f(x0 + (i+1) * h) + f(x0 + (i+2) * h)
end

integral = (3 * h * s)/8

printf('\n The value of integral is = %g \n', integral)
```

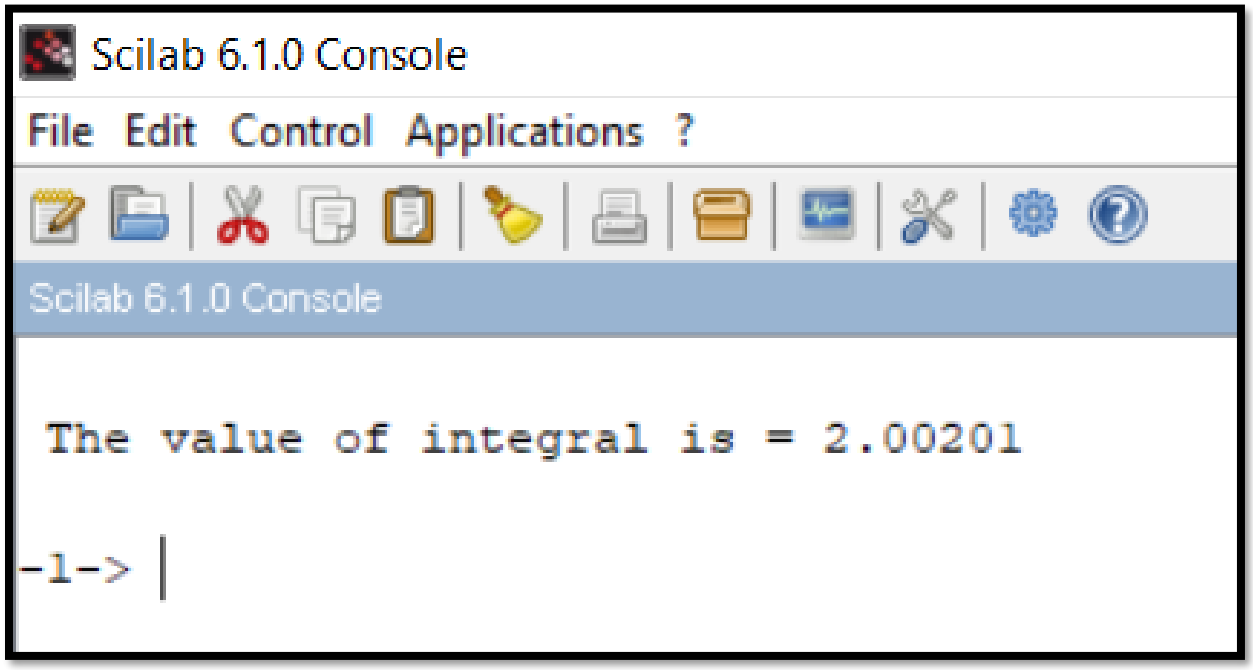
Output:


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
Name - Syeda Reeha Quasar
Enrolment No. - 14114802719
Group - C7
The value of integral is = 1.35708
-1->

// Program to find integration by using Simpson's 3/8 rule

```
clc
clear
close

deff ('y = f(x)', 'y = sin(x)')

x0 = 0
xn = %pi
n = 6
h = (xn - x0)/n
s = 0

for i = 1:3:n
   s = s + f(x0 + (i - 1)*h) + 3*f(x0 + i * h) + 3 * f(x0 + (i+1) * h) + f(x0 + (i+2) * h)
end

integral = (3 * h * s)/8

printf('\n The value of integral is = %g \n', integral)
```

Output:


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
The value of integral is = 2.00201
-1->