



# 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.

Syeda Reeha Quasar

14114802719

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)')

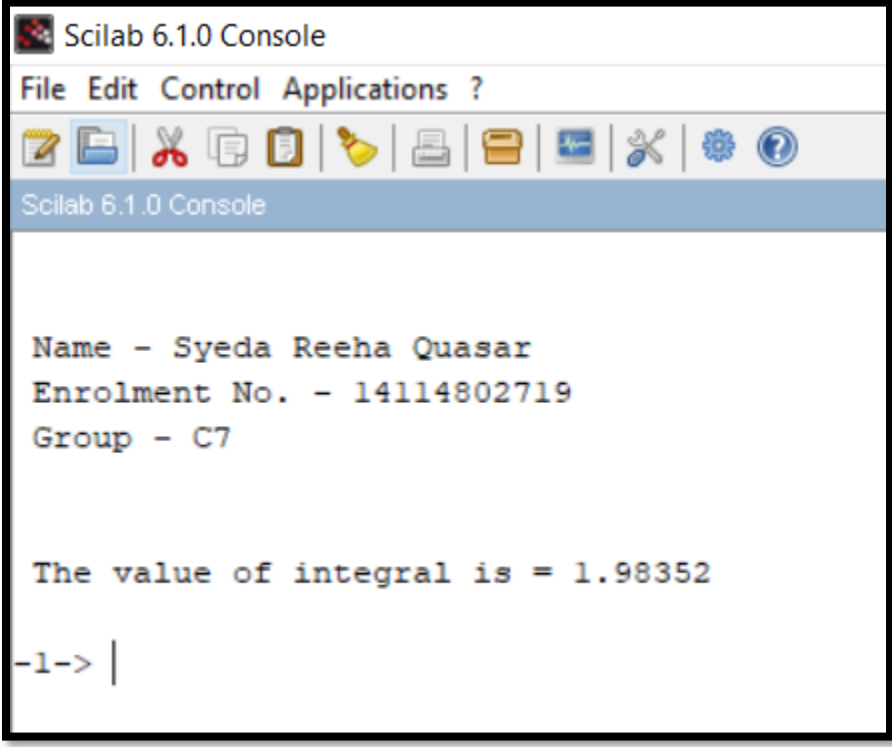
x0 = 0
xn = %pi
n = 10
h = (xn - x0)/n
s = 0

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 ?

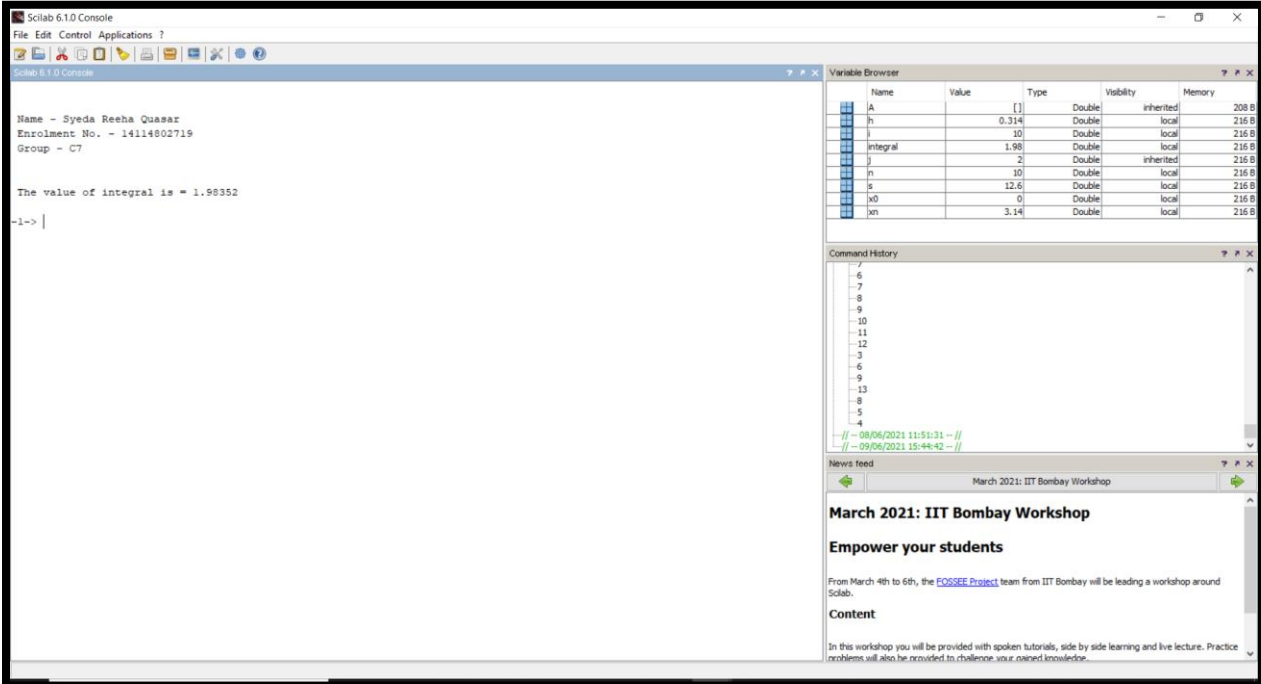
Scilab 6.1.0 Console

```

Name - Syeda Reeha Quasar
Enrolment No. - 14114802719
Group - C7

The value of integral is = 1.98352

-1-> |
  
```



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-> |
  
```

**Variable Browser**

Name	Value	Type	Visibility	Memory
A	[1]	Double	inherited	208 B
n	0.314	Double	local	216 B
i	10	Double	local	216 B
integral	1.98	Double	local	216 B
j	2	Double	inherited	216 B
n	10	Double	local	216 B
s	12.6	Double	local	216 B
x0	0	Double	local	216 B
xn	3.14	Double	local	216 B

**Command History**

```

-6
-7
-8
-9
-10
-11
-12
-3
-6
-9
-13
-8
-5
-4
-// - 08/06/2021 11:51:31 - //
-// - 09/06/2021 15:44:42 - //
  
```

**News feed**

March 2021: IIT Bombay Workshop

**March 2021: IIT Bombay Workshop**

**Empower your students**

From March 4th to 6th, the [FOSSEE Project](#) team from IIT Bombay will be leading a workshop around Scilab.

**Content**

In this workshop you will be provided with spoken tutorials, side by side learning and live lecture. Practice problems will also be provided to challenge your own knowledge.

***// Program to find integration by using Trapezoidal rule***

clc  
clear  
close

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

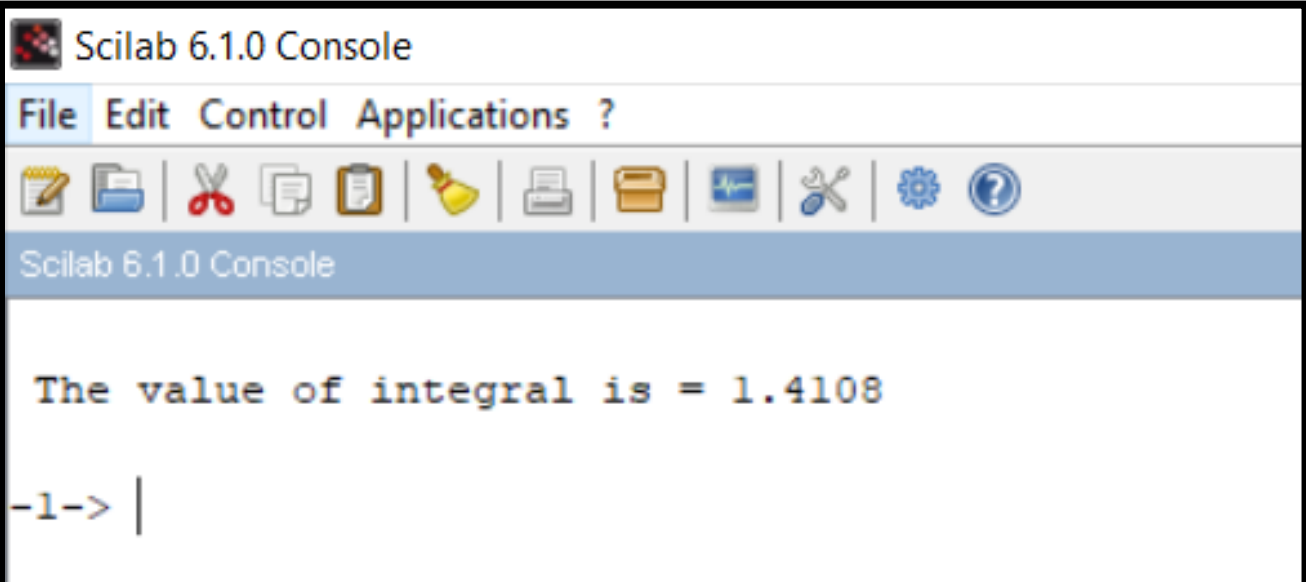
x0 = 0  
xn = 6  
n = 6  
h = (xn - x0)/n  
s = 0

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:



The image shows a screenshot of the Scilab 6.1.0 Console window. The window has a title bar that says "Scilab 6.1.0 Console". Below the title bar is a menu bar with the following items: "File", "Edit", "Control", "Applications", and "?". Below the menu bar is a toolbar with various icons: a notepad, a folder, a pair of scissors, a document, a clipboard, a bell, a printer, a trash can, a heart rate monitor, a pair of scissors, a gear, and a question mark. Below the toolbar is a blue header bar that says "Scilab 6.1.0 Console". The main area of the console is white and contains the text "The value of integral is = 1.4108" and a prompt "-1-> |".

```
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')

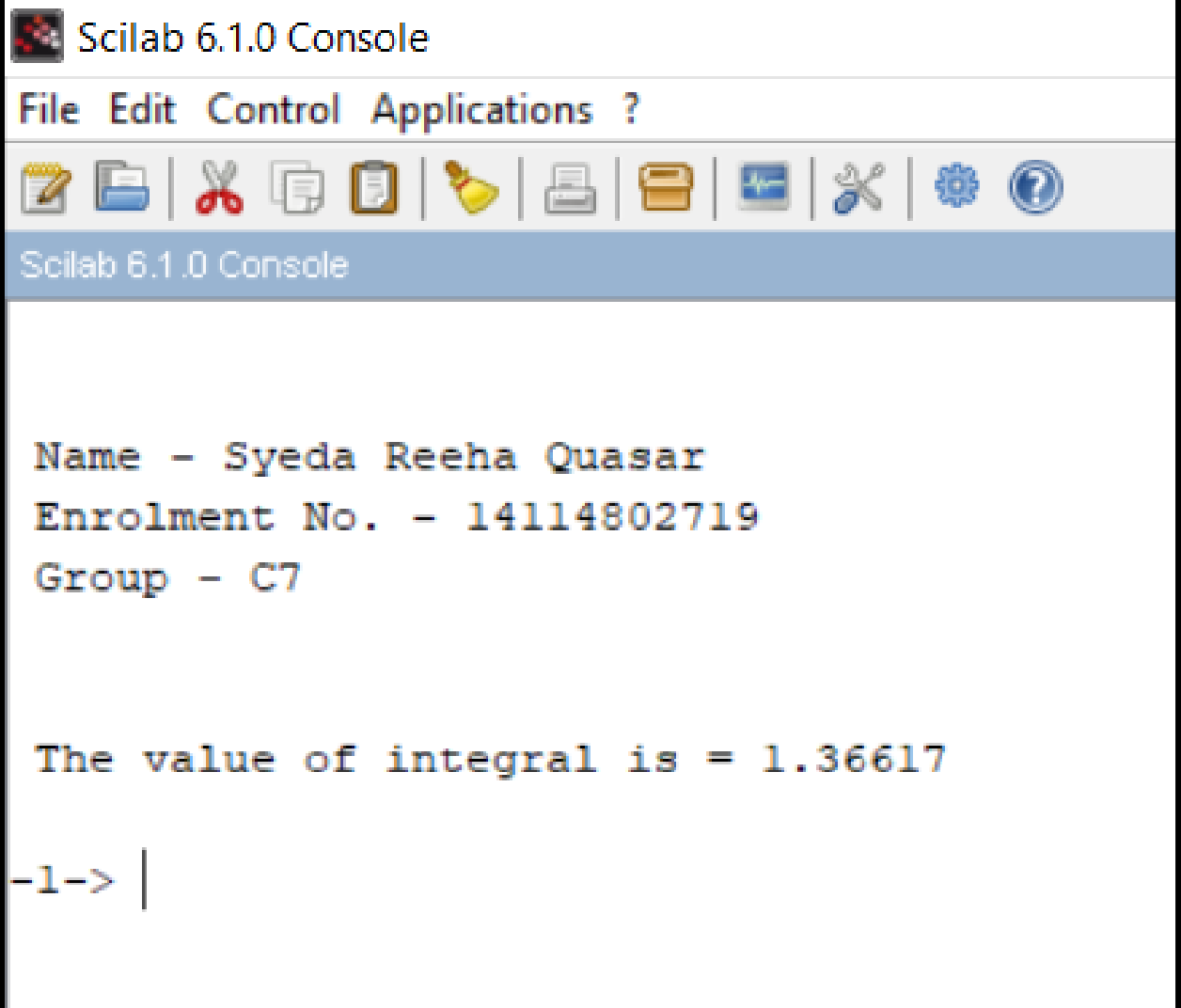
deff ('y = f(x)', 'y = 1/(1 + x^2)')

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:**A screenshot of the Scilab 6.1.0 Console window. The window has a title bar with the Scilab logo and the text "Scilab 6.1.0 Console". Below the title bar is a menu bar with "File", "Edit", "Control", "Applications", and "?". Under the menu bar is a toolbar with various icons: a notepad, a folder, scissors, a document, a clipboard, a bell, a printer, a folder, a waveform, a wrench and screwdriver, a gear, and a question mark. Below the toolbar is a blue header bar with the text "Scilab 6.1.0 Console". The main area of the window is white and contains the following text:

```
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
```

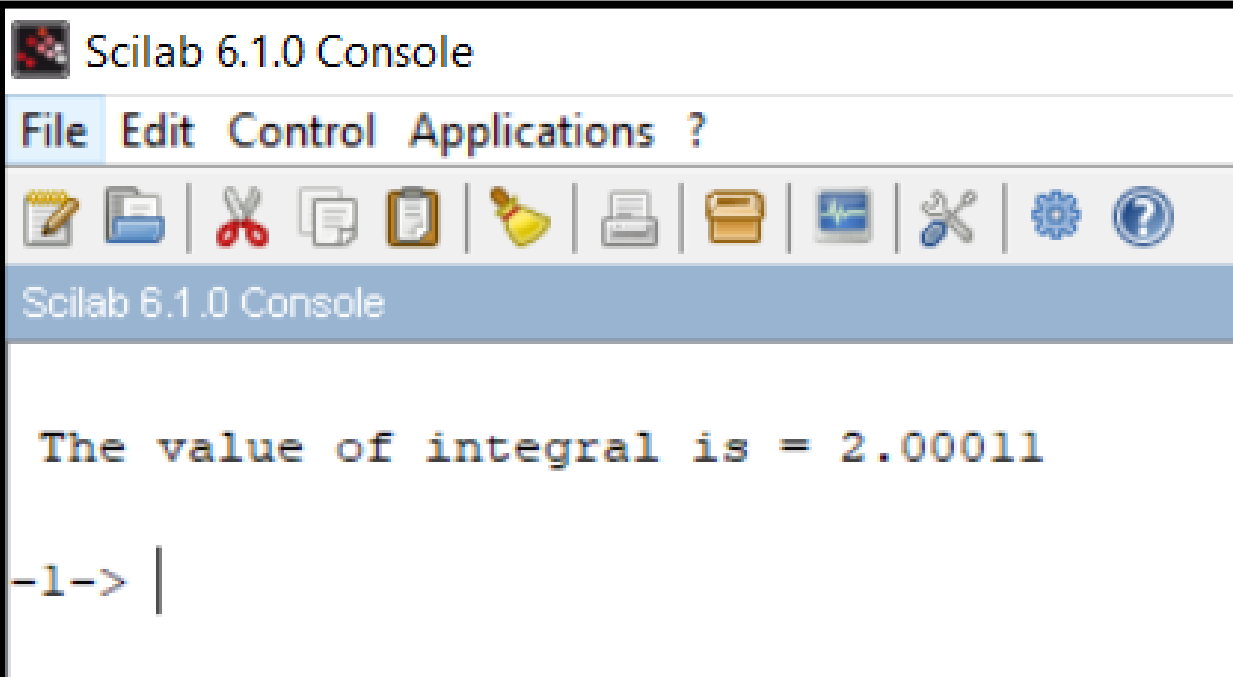
```
for i = 1:2:n  
    s = s + f(x0 + (i - 1)*h) + 4*f(x0 + i * h) + f(x0 + (i+1) * h)  
end
```

```
integral = (h * s)/3
```

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



## Output:



The image shows a screenshot of the Scilab 6.1.0 Console window. The window has a title bar that says "Scilab 6.1.0 Console". Below the title bar is a menu bar with the following items: "File", "Edit", "Control", "Applications", and "?". Below the menu bar is a toolbar with various icons: a notepad, a folder, a pair of scissors, a document, a clipboard, a lightbulb, a printer, a trash can, a graph, a wrench and screwdriver, a gear, and a question mark. Below the toolbar is a status bar that says "Scilab 6.1.0 Console". The main area of the window is a text editor with a white background. It contains the text "The value of integral is = 2.00011" in a monospaced font. Below this text is a prompt line that says "-1-> |".

```
Scilab 6.1.0 Console
```

```
The value of integral is = 2.00011
```

```
-1-> |
```

## 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)')
```

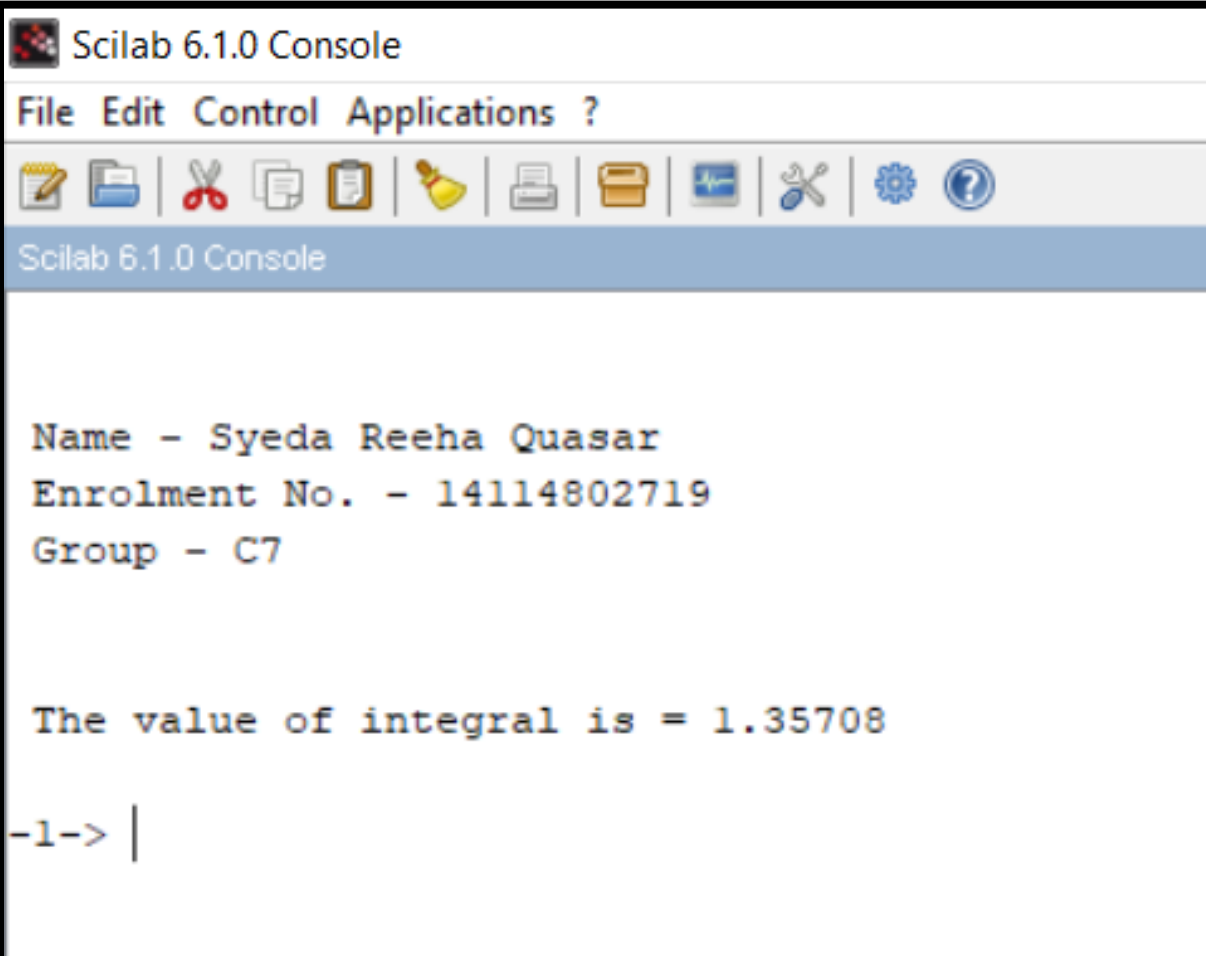
```
x0 = 0
xn = 6
n = 6
h = (xn - x0)/n
s = 0
```

```
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:



The image shows a screenshot of the Scilab 6.1.0 Console window. The window has a title bar that says "Scilab 6.1.0 Console". Below the title bar is a menu bar with the options "File", "Edit", "Control", "Applications", and "?". Under the menu bar is a toolbar with various icons for file operations (like open, save, print), editing (like cut, copy, paste), and other functions (like help, settings). The main area of the console is a text editor with a light blue background. It contains the following text: "Name - Syeda Reeha Quasar", "Enrolment No. - 14114802719", "Group - C7", and "The value of integral is = 1.35708". At the bottom of the console, there is a prompt "-1->" followed by a vertical bar, indicating that the user can enter a command.

```
Scilab 6.1.0 Console

File Edit Control Applications ?

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
```

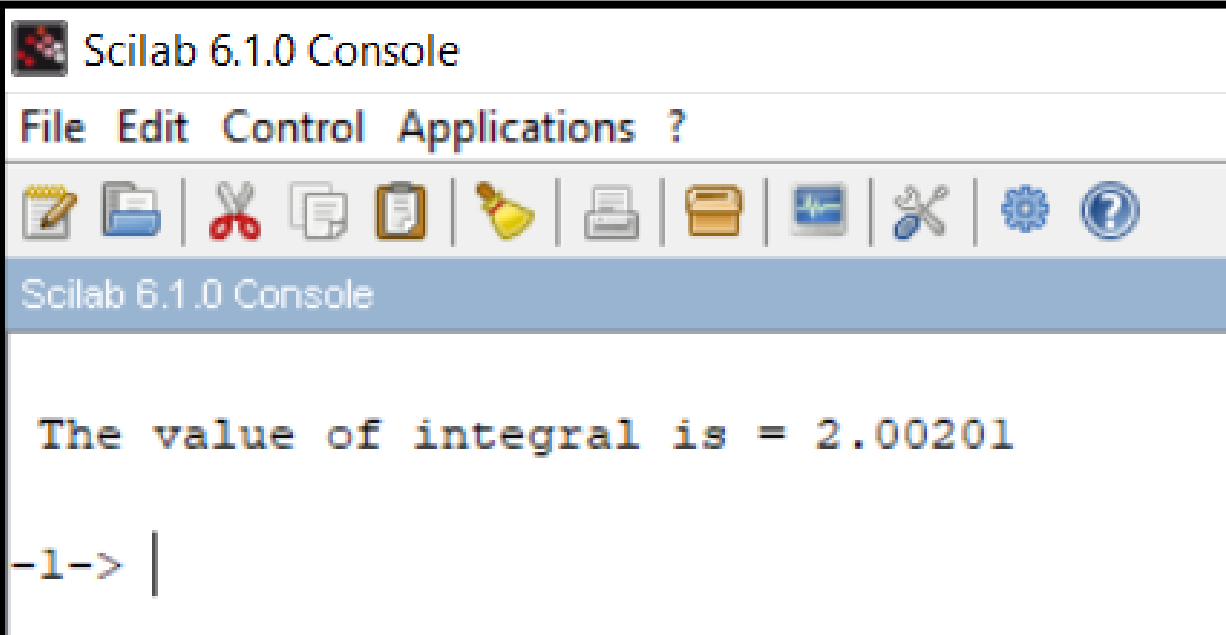
```
deff ('y = f(x)', 'y = sin(x)')
```

```
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:**

The image shows a screenshot of the Scilab 6.1.0 Console window. The window has a title bar that says "Scilab 6.1.0 Console". Below the title bar is a menu bar with the following items: "File", "Edit", "Control", "Applications", and "?". Below the menu bar is a toolbar with various icons: a notepad, a folder, a pair of scissors, a document, a clipboard, a bell, a printer, a folder, a waveform, a pair of scissors, a gear, and a question mark. Below the toolbar is a blue header bar that says "Scilab 6.1.0 Console". The main area of the window is white and contains the text "The value of integral is = 2.00201" in a monospaced font. Below this text is a prompt "-1->" followed by a vertical line, indicating that the user can enter a command.

```
Scilab 6.1.0 Console
```

```
The value of integral is = 2.00201
```

```
-1-> |
```