



# EXPERIMENT - 1

## APPLIED MATHEMATICS LAB

### Aim

Algebra of Matrices

- a) To find transpose of a matrix.
- b) To find addition of two matrices.
- c) To find multiplication of two matrices.

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## EXPERIMENT – 1

### Aim:

Algebra of Matrices

- a) To find transpose of a matrix.
- b) To find addition of two matrices.
- c) To find multiplication of two matrices

### To Find transpose of a Matrix

#### Source Code:

```
m = input('Enter no. of rows of matrix')
n = input('Enter no. of columns of matrix')
A = zeros(m, n);
B = zeros(m, n);

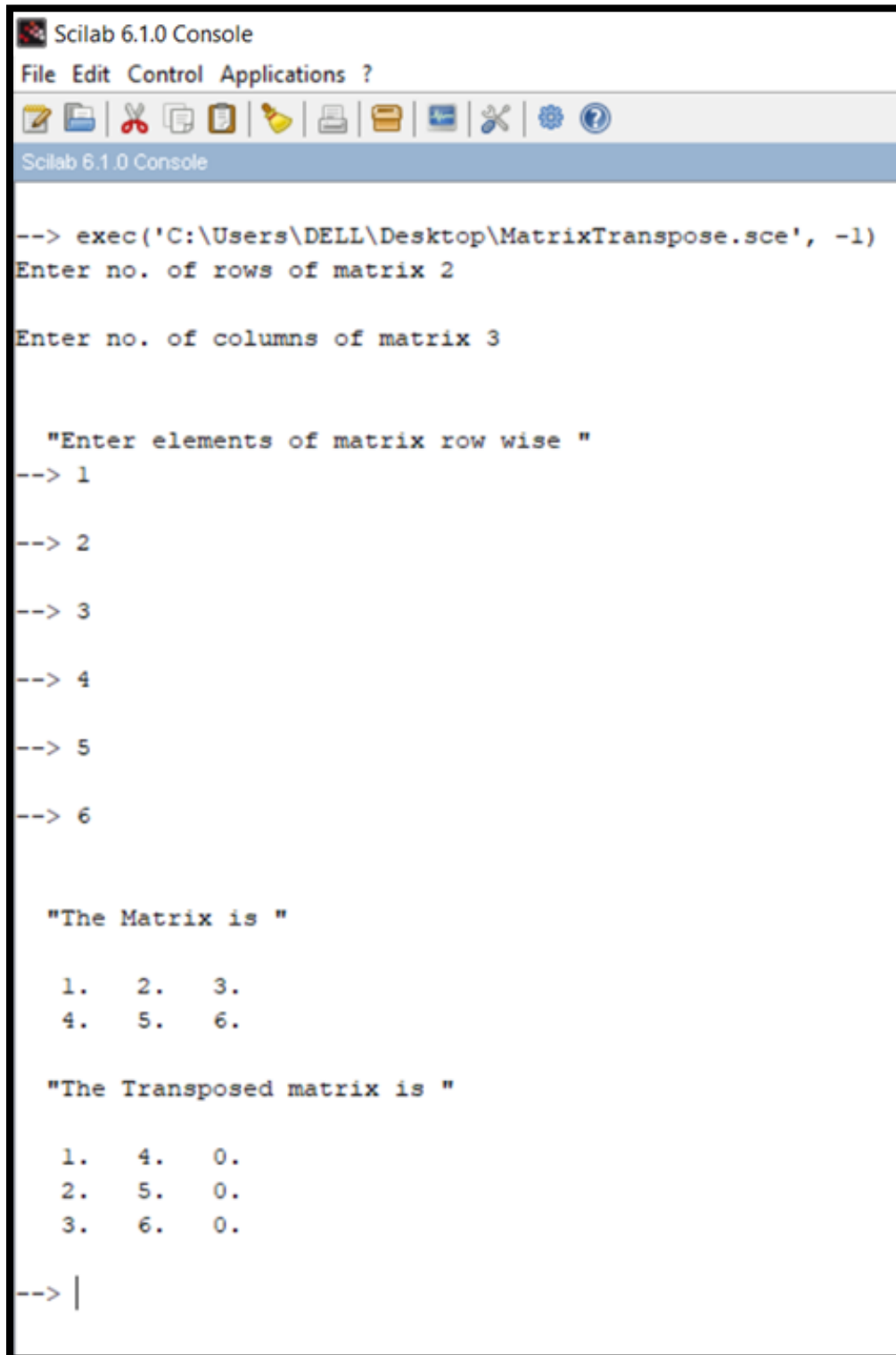
disp('Enter elements of matrix row wise ')

for i = 1:m
    for j = 1:n
        A(i, j) = input('');
    end
end

for i = 1:n
    for j = 1:m
        B(i, j) = A(j, i);
    end
end

disp('The Matrix is ', A)
disp('The Transposed matrix is ', B)
```

## Output:



```
Scilab 6.1.0 Console
File Edit Control Applications ?
--> exec('C:\Users\DELL\Desktop\MatrixTranspose.sce', -1)
Enter no. of rows of matrix 2

Enter no. of columns of matrix 3

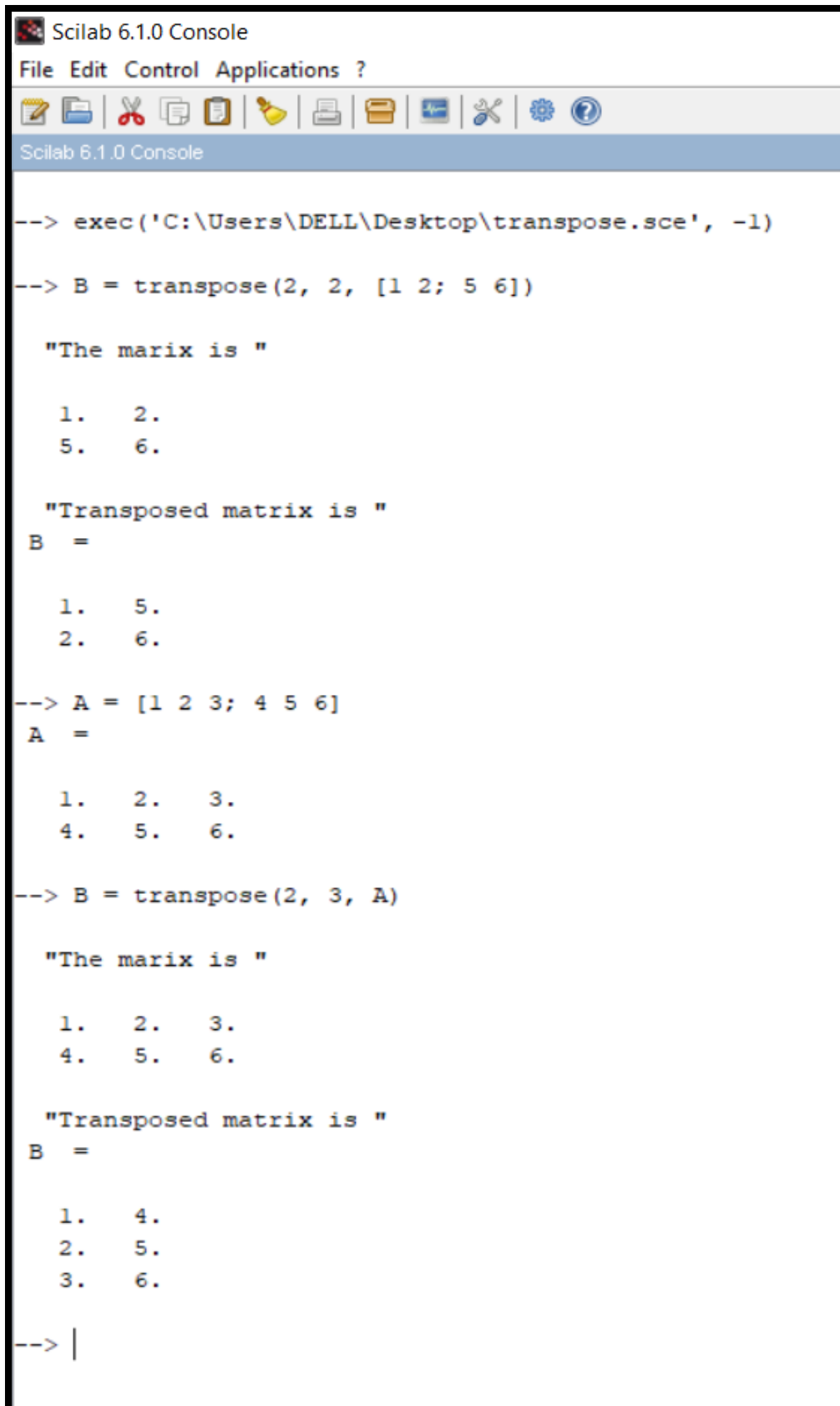
    "Enter elements of matrix row wise "
--> 1
--> 2
--> 3
--> 4
--> 5
--> 6

    "The Matrix is "

    1.   2.   3.
    4.   5.   6.

    "The Transposed matrix is "

    1.   4.   0.
    2.   5.   0.
    3.   6.   0.
--> |
```



The image shows 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', and 'Applications ?'. Underneath the menu bar is a toolbar with various icons for file operations (new, open, save, print, etc.) and editing (undo, redo, cut, paste, etc.). The main area of the window is a text editor with a light blue background. It contains the following text:

```
--> exec('C:\Users\DELL\Desktop\transpose.sce', -1)

--> B = transpose(2, 2, [1 2; 5 6])

    "The marix is "

    1.    2.
    5.    6.

    "Transposed matrix is "
    B =

    1.    5.
    2.    6.

--> A = [1 2 3; 4 5 6]
    A =

    1.    2.    3.
    4.    5.    6.

--> B = transpose(2, 3, A)

    "The marix is "

    1.    2.    3.
    4.    5.    6.

    "Transposed matrix is "
    B =

    1.    4.
    2.    5.
    3.    6.

--> |
```

## To Find Addition of two Matrices

### Source Code:

```
m = input('Enter no. of rows')
n = input('Enter no. of columns')
A = zeros(m, n)
B = zeros(m, n)
C = zeros(m, n)

disp('Enter elements of first matrix row wise ')

for i = 1:m
    for j = 1:n
        A(i, j) = input('')
    end
end

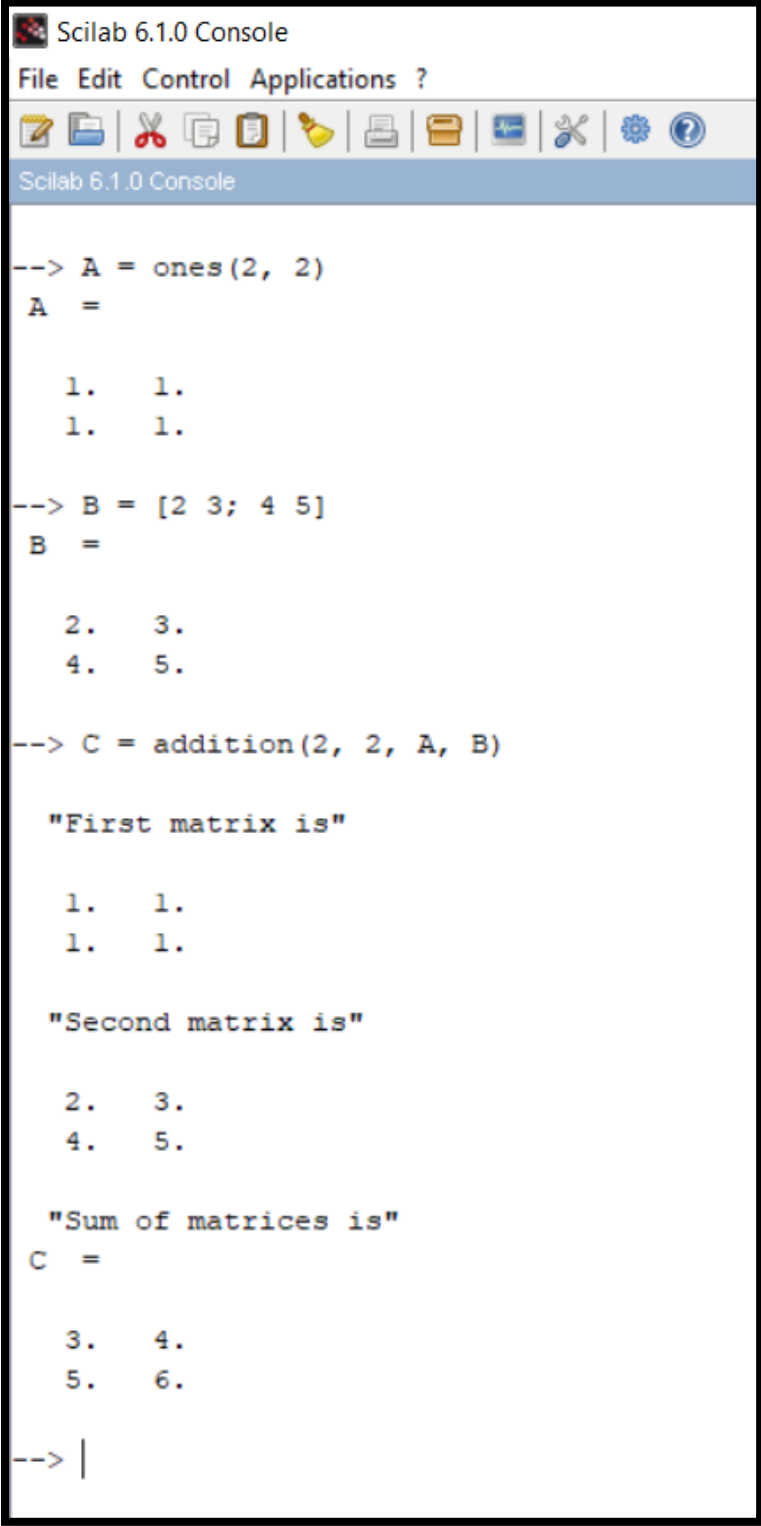
disp('Enter elements of second matrix row wise ')

for i = 1:m
    for j = 1:n
        B(i, j) = input('')
    end
end

for i = 1:m
    for j = 1:n
        C(i, j) = A(i, j) + B(i, j)
    end
end

disp('First Matrix is ', A);
disp('Second Matrix is ', B);
disp('Sum of the matrices is ', C);
```

## Output:



```
Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console

--> A = ones(2, 2)
A =

    1.    1.
    1.    1.

--> B = [2 3; 4 5]
B =

    2.    3.
    4.    5.

--> C = addition(2, 2, A, B)

"First matrix is"

    1.    1.
    1.    1.

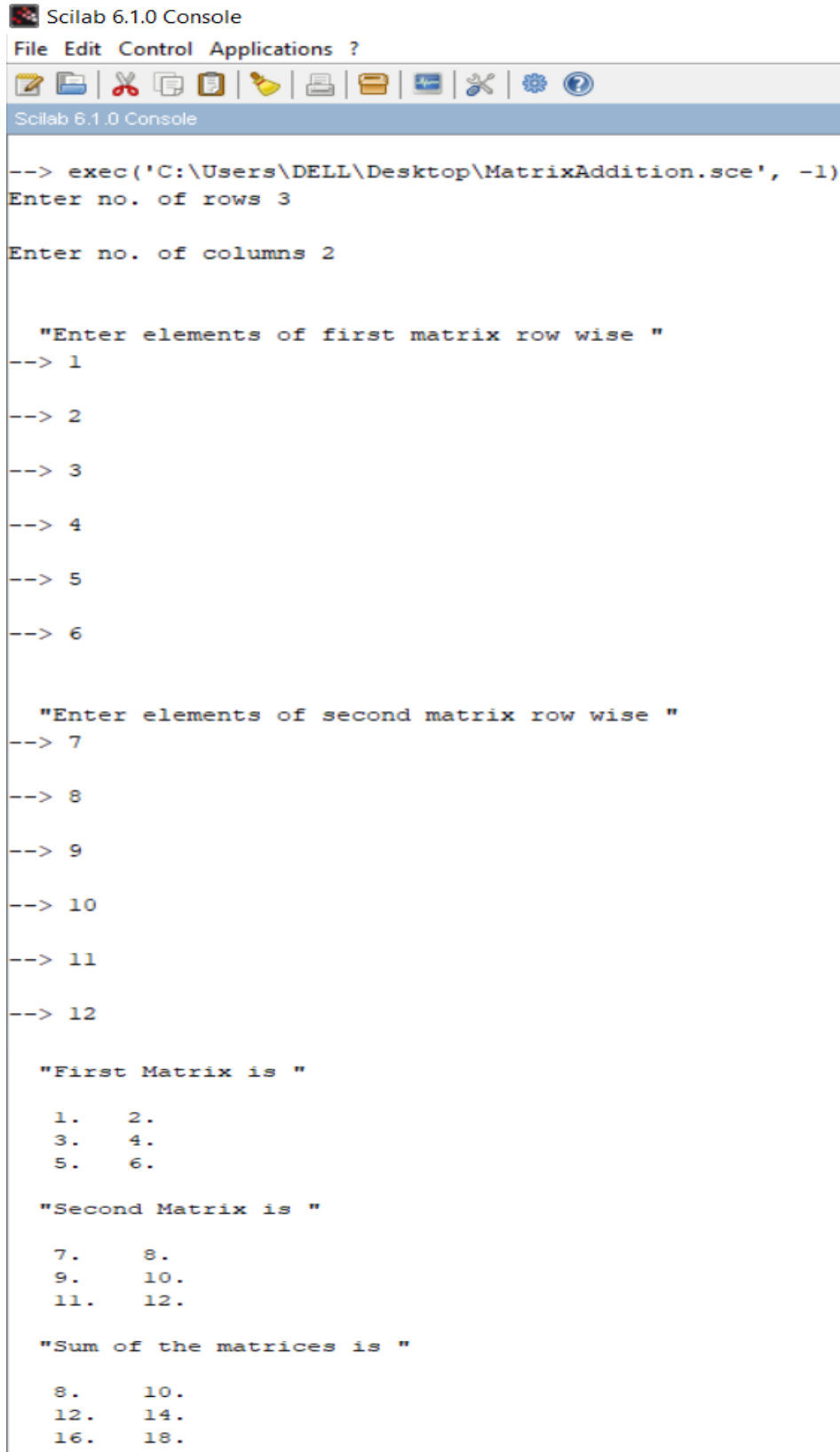
"Second matrix is"

    2.    3.
    4.    5.

"Sum of matrices is"
C =

    3.    4.
    5.    6.

--> |
```



The image shows 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', and 'Applications ?'. Underneath the menu bar is a toolbar with various icons for file operations (new, open, save, print, etc.) and editing (undo, redo, cut, copy, paste, etc.). The main area of the window is a text editor displaying the execution of a script. The script starts with a command to execute a file named 'MatrixAddition.sce' located at 'C:\Users\DELL\Desktop'. The script then prompts the user to enter the number of rows (3) and columns (2). It then prompts the user to enter the elements of the first matrix row wise (1, 2, 3, 4, 5, 6). Next, it prompts the user to enter the elements of the second matrix row wise (7, 8, 9, 10, 11, 12). Finally, it displays the sum of the two matrices, which is a 3x2 matrix with elements 8, 10, 12, 14, 16, 18.

```
--> exec('C:\Users\DELL\Desktop\MatrixAddition.sce', -1)
Enter no. of rows 3
Enter no. of columns 2

    "Enter elements of first matrix row wise "
--> 1
--> 2
--> 3
--> 4
--> 5
--> 6

    "Enter elements of second matrix row wise "
--> 7
--> 8
--> 9
--> 10
--> 11
--> 12

    "First Matrix is "

    1.    2.
    3.    4.
    5.    6.

    "Second Matrix is "

    7.    8.
    9.    10.
    11.    12.

    "Sum of the matrices is "

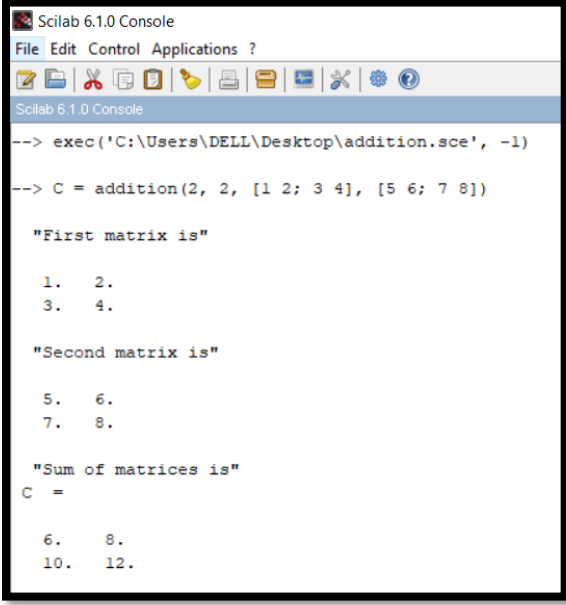
    8.    10.
    12.    14.
    16.    18.
```

**Source Code:**

```
function [C]=addition(m, n, A, B)
    C = zeros(m, n);
    C = A + B;
    disp('First matrix is', A)
    disp('Second matrix is', B)
    disp('Sum of matrices is')
endfunction
```



## Output:



```
Scilab 6.1.0 Console
File Edit Control Applications ?
--> exec('C:\Users\DELL\Desktop\addition.sce', -1)
--> C = addition(2, 2, [1 2; 3 4], [5 6; 7 8])

"First matrix is"

1.  2.
3.  4.

"Second matrix is"

5.  6.
7.  8.

"Sum of matrices is"
C =

6.  8.
10. 12.
```

## To Find multiplication of two Matrices

### Source Code:

```

m = input('Enter no. of rows columns of first matrix')
n = input('Enter no. of columns of first matrix')
p = input('Enter no. of rows of second matrix')
q = input('Enter no. of columns of second matrix')

if n == p then
    disp('Matrices are comfortable for multiplication')
else
    disp('Matrices are not comfortable for multiplication')
    abort
end

A = zeros(m, n)
B = zeros(p, q)
C = zeros(m, q)

disp('Enter elements of first matrix row wise ')

for i = 1:m
    for j = 1:n
        A(i, j) = input('')
    end
end

disp('Enter elements of second matrix row wise ')

for i = 1:p
    for j = 1:q
        B(i, j) = input('')
    end
end

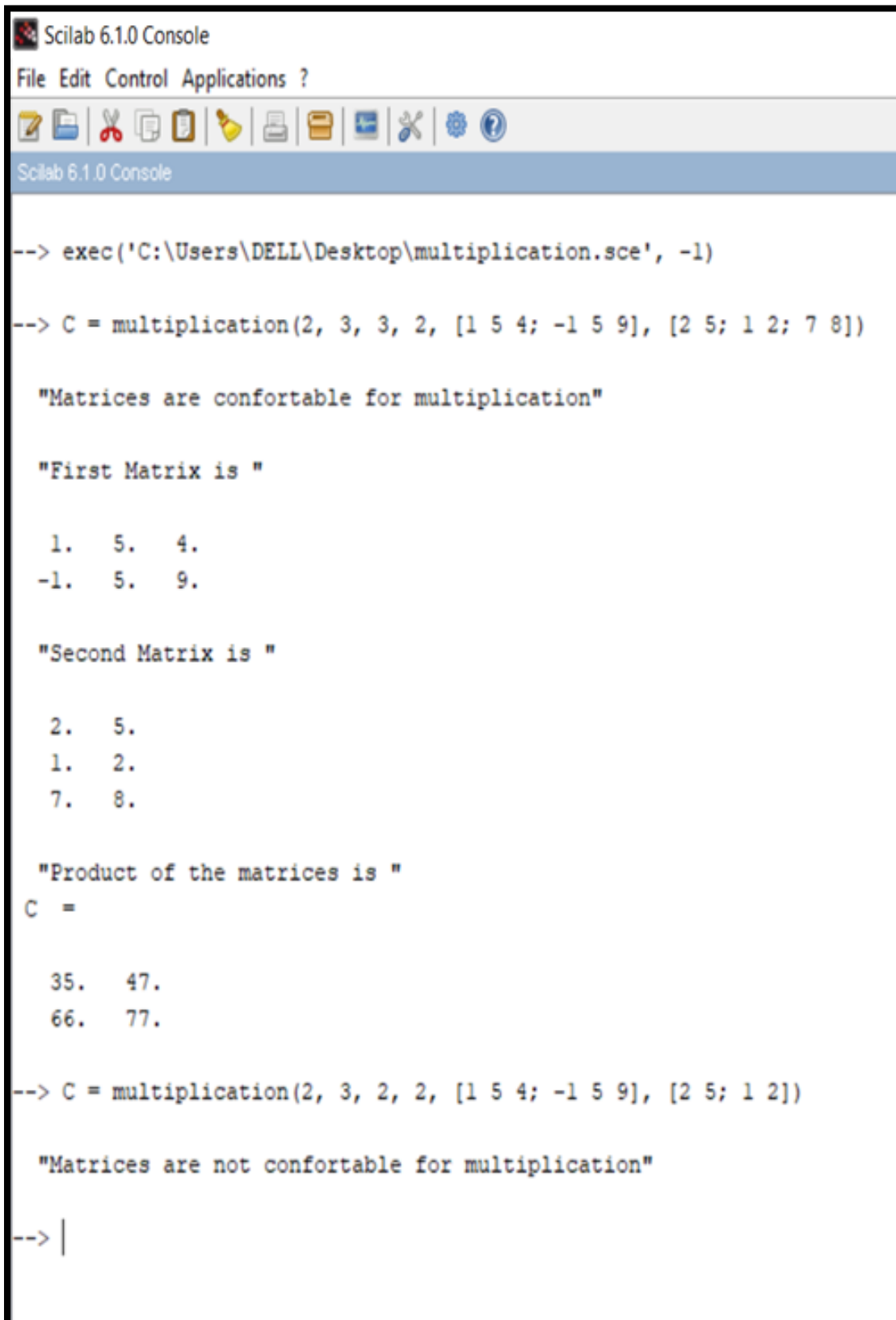
for i = 1:m
    for j = 1:q
        for k = 1:n

```

```
        C(i, j) = C(i, j) + (A(i, j) * B(k, j))
    end
end
end
```

```
disp('First Matrix is ', A);
disp('Second Matrix is ', B);
disp('Product of the matrices is ', C);
```

## Output:



```

Scilab 6.1.0 Console
File Edit Control Applications ?
[Icons: Save, Open, Print, Copy, Paste, Undo, Redo, Find, Help, etc.]
Scilab 6.1.0 Console

--> exec('C:\Users\DELL\Desktop\multiplication.sce', -1)

--> C = multiplication(2, 3, 3, 2, [1 5 4; -1 5 9], [2 5; 1 2; 7 8])

    "Matrices are confortable for multiplication"

    "First Matrix is "

    1.   5.   4.
    -1.  5.   9.

    "Second Matrix is "

    2.   5.
    1.   2.
    7.   8.

    "Product of the matrices is "
C =

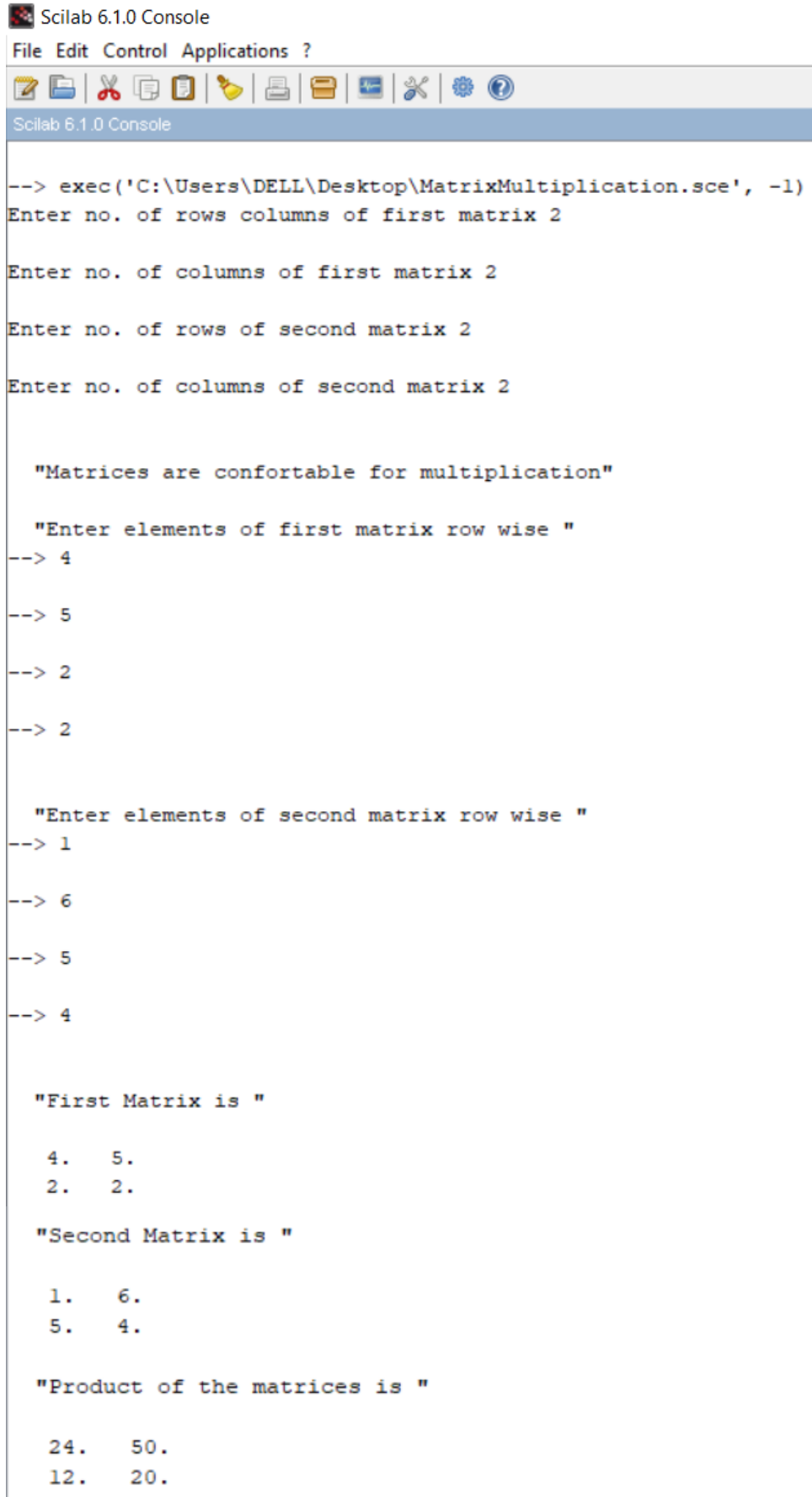
    35.   47.
    66.   77.

--> C = multiplication(2, 3, 2, 2, [1 5 4; -1 5 9], [2 5; 1 2])

    "Matrices are not confortable for multiplication"

--> |

```



The image shows a screenshot of the Scilab 6.1.0 Console window. The window has a title bar 'Scilab 6.1.0 Console' and a menu bar with 'File', 'Edit', 'Control', 'Applications', and '?'. Below the menu bar is a toolbar with icons for file operations (new, open, save, print, etc.) and a status bar. The main area displays the execution of a script 'MatrixMultiplication.sce'. The script prompts for the dimensions of two matrices, enters their elements row-wise, and then displays the resulting product matrix.

```
--> exec('C:\Users\DELL\Desktop\MatrixMultiplication.sce', -1)
Enter no. of rows columns of first matrix 2

Enter no. of columns of first matrix 2

Enter no. of rows of second matrix 2

Enter no. of columns of second matrix 2

    "Matrices are comfortable for multiplication"

    "Enter elements of first matrix row wise "
--> 4
--> 5
--> 2
--> 2

    "Enter elements of second matrix row wise "
--> 1
--> 6
--> 5
--> 4

    "First Matrix is "

    4.    5.
    2.    2.

    "Second Matrix is "

    1.    6.
    5.    4.

    "Product of the matrices is "

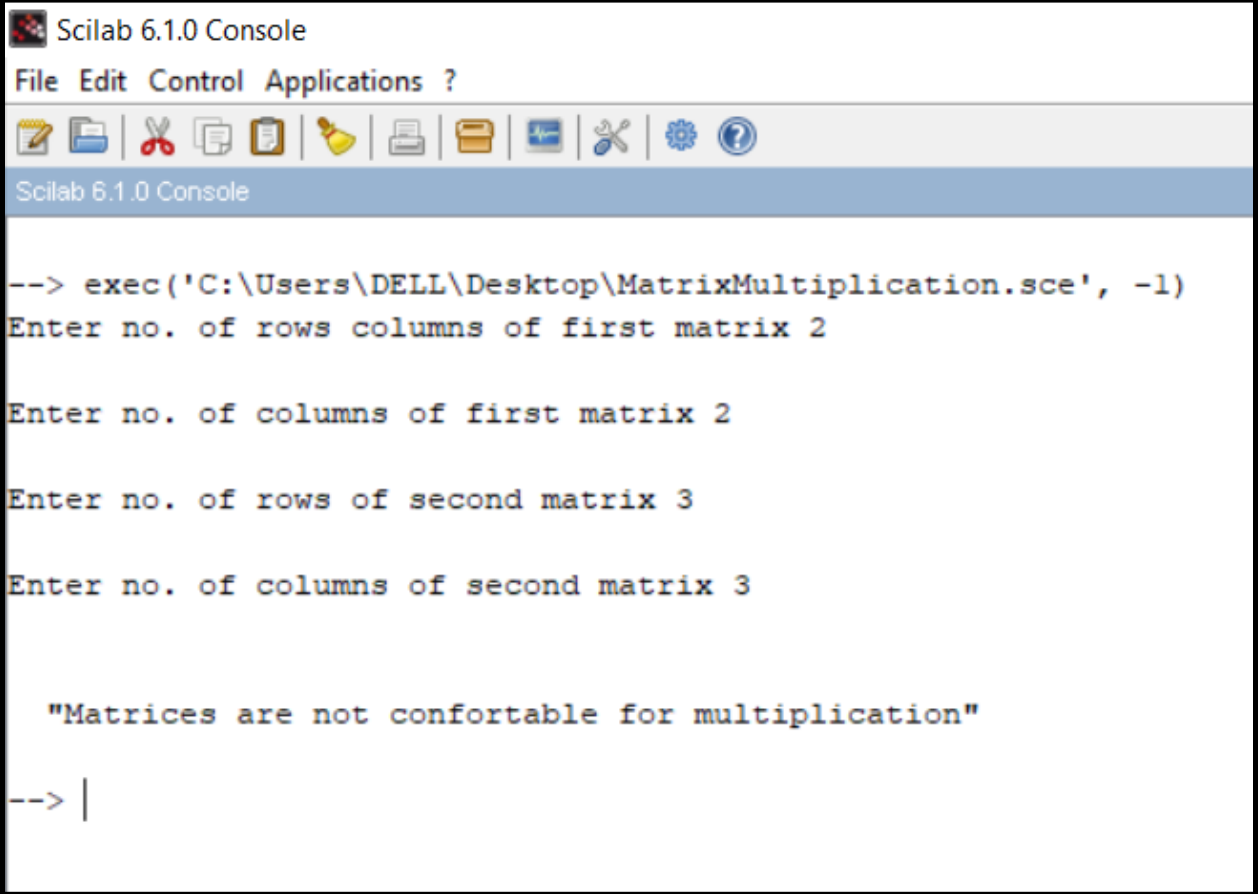
    24.    50.
    12.    20.
```

## To Find multiplication of two Matrices

### Source Code:

```
function [C]=multiplication(m, n, p, q, A, B)
    C = zeros(m, n)
    if n == p then
        disp('Matrices are comfortable for multiplication')
    else
        disp('Matrices are not comfortable for multiplication')
        abort
    end
    C = A * B
    disp('First Matrix is ', A);
    disp('Second Matrix is ', B);
    disp('Product of the matrices is ')
endfunction
```

## 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 "File", "Edit", "Control", "Applications", and "?". Under the menu bar is a toolbar with various icons for file operations, editing, and help. The main area of the window is a text editor showing the following text:

```
--> exec('C:\Users\DELL\Desktop\MatrixMultiplication.sce', -1)
Enter no. of rows columns of first matrix 2

Enter no. of columns of first matrix 2

Enter no. of rows of second matrix 3

Enter no. of columns of second matrix 3

    "Matrices are not comfortable for multiplication"

--> |
```