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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Aim:

Algebra of Matrices

a) To find transpose of a matrix.

b) To find addition of two matrices.

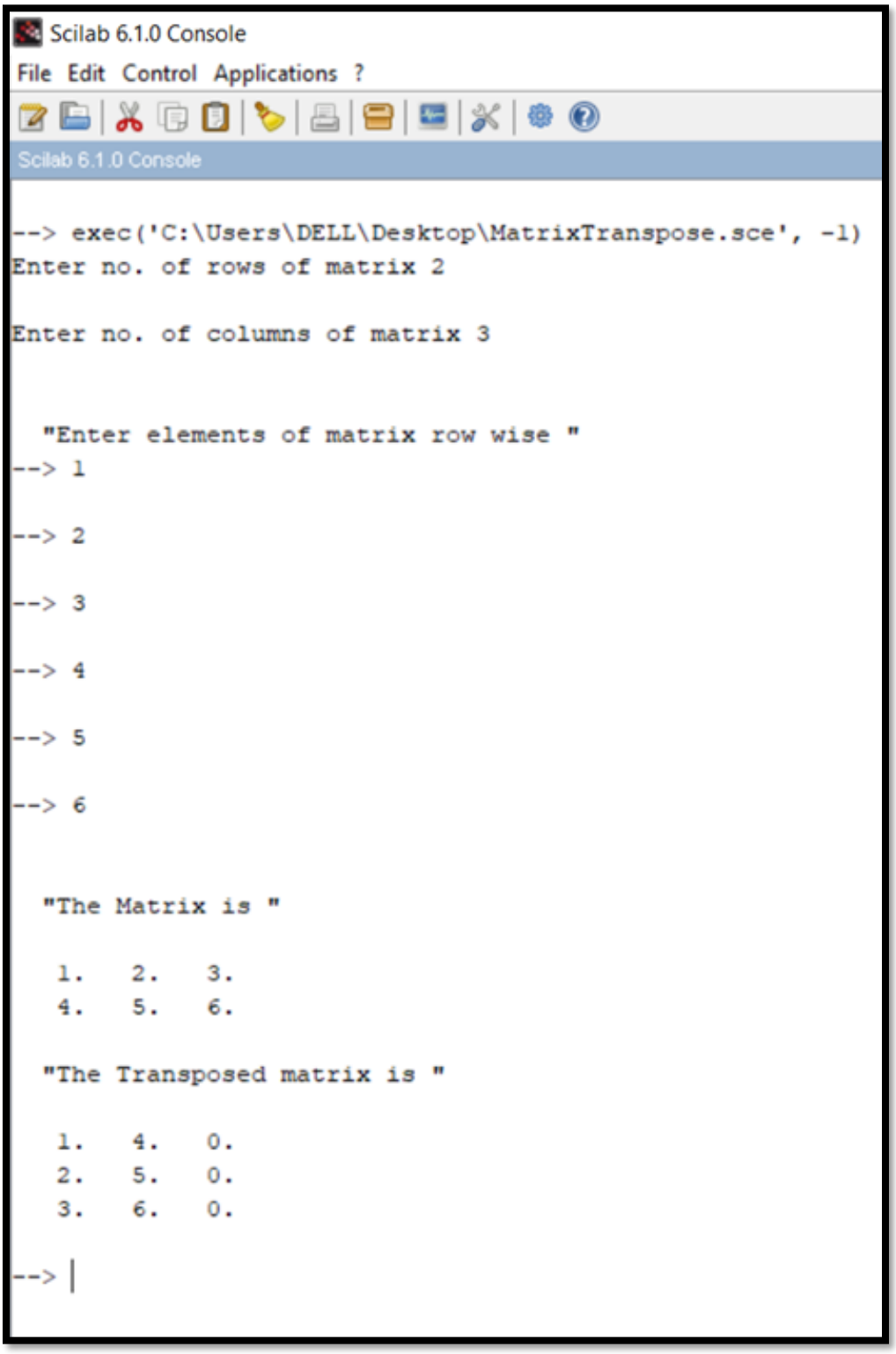
c) To find multiplication of two matrices

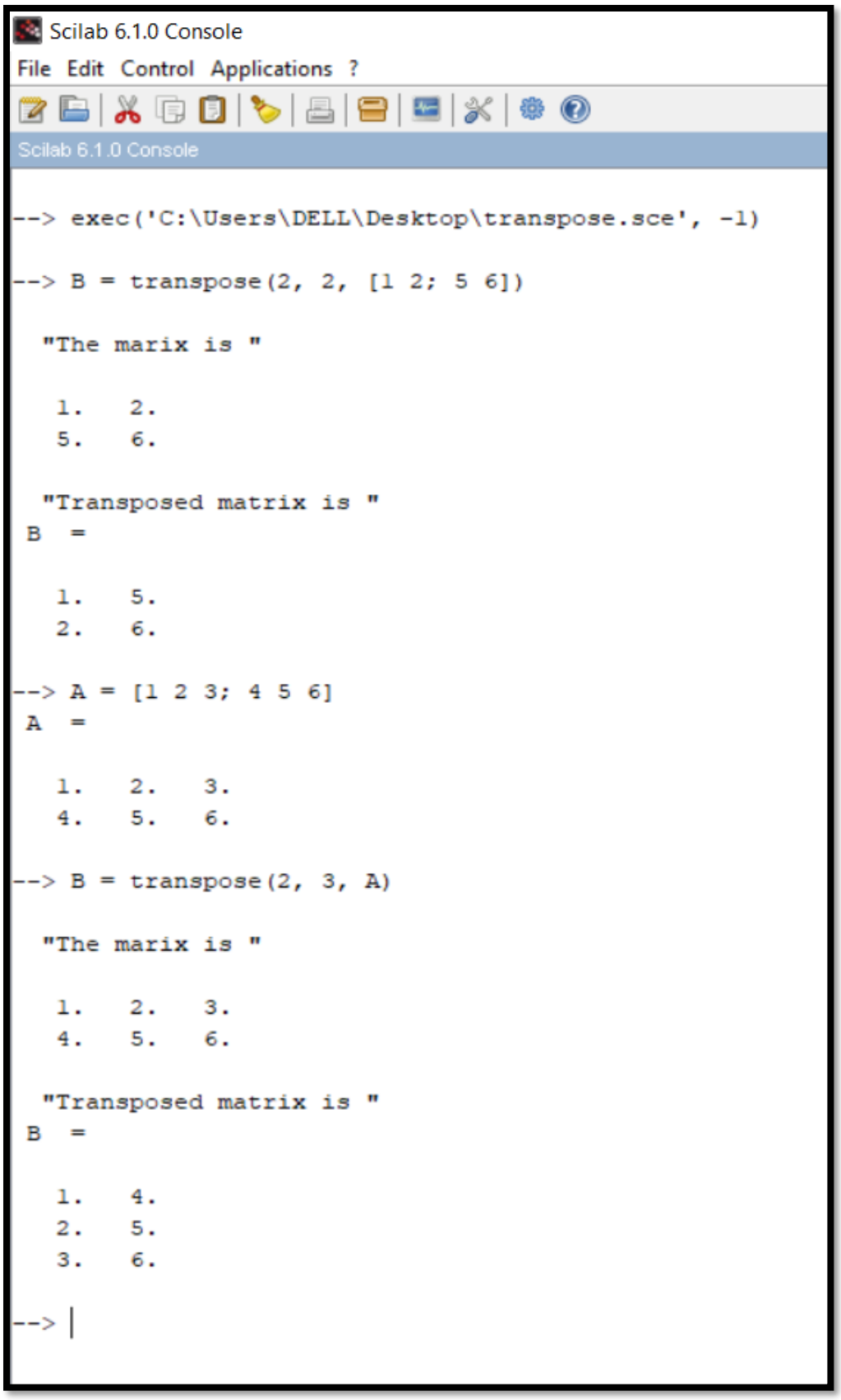
To Find transpose of a Matrix

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 ?
Scilab 6.1.0 Console
--> 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.
-->

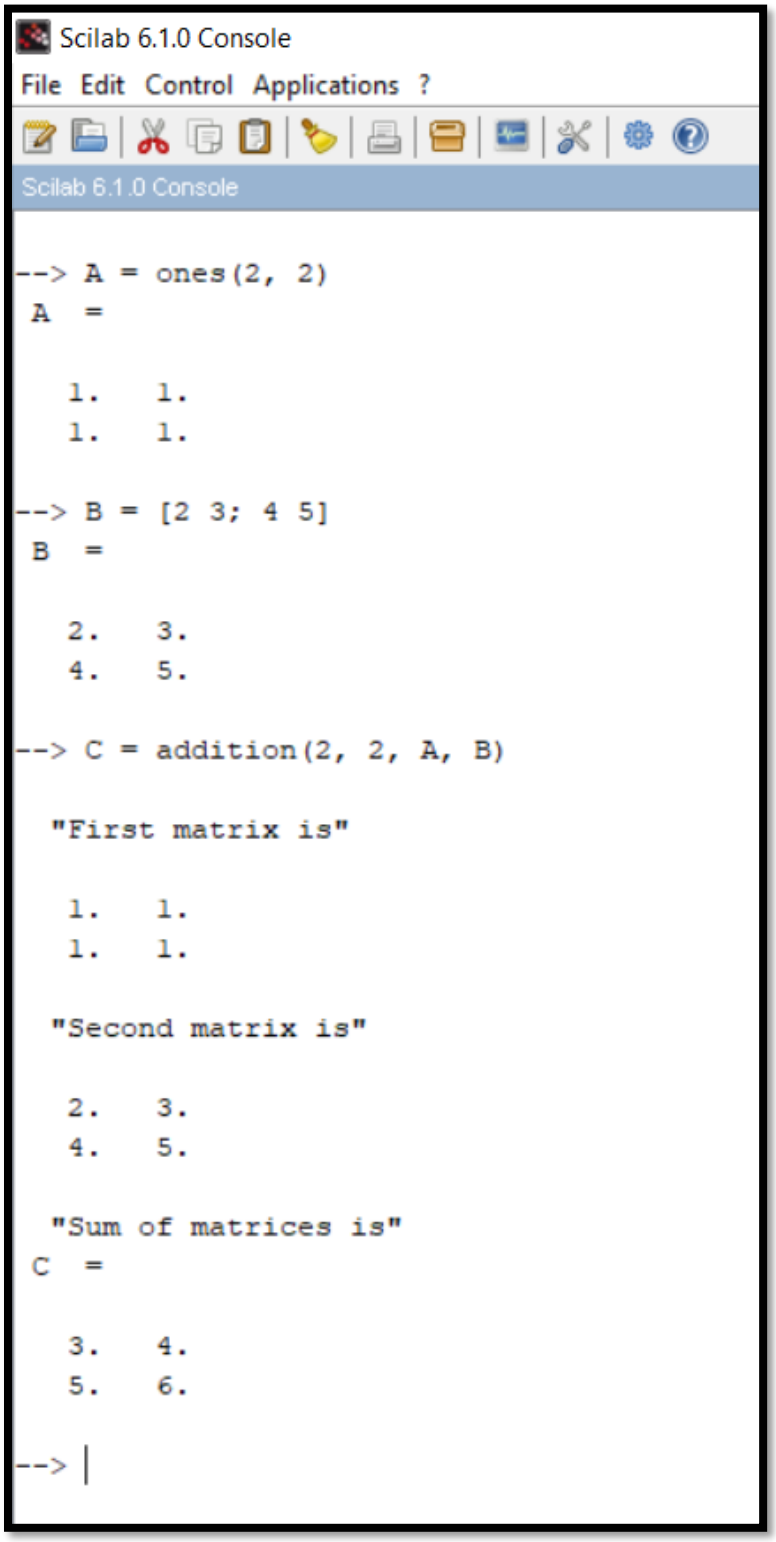

Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
--> exec('C:\Users\DELL\Desktop\transpose.sce', -1)
--> B = transpose(2, 2, [1 2; 5 6])
"The marix is "
1. 2.
5. 6.
"Transposed matrix is "
B =
1. 5.
2. 6.
--> A = [1 2 3; 4 5 6]
A =
1. 2. 3.
4. 5. 6.
--> B = transpose(2, 3, A)
"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.
-->

Scilab 6.1.0 Console

File Edit Control Applications ?

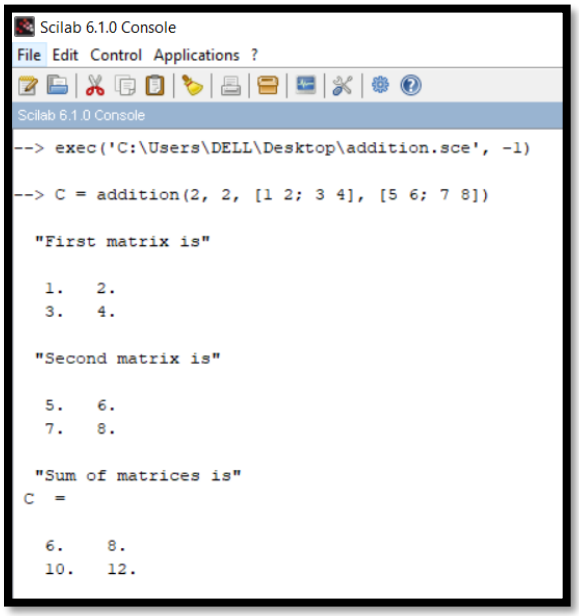
Scilab 6.1.0 Console

```
--> 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 ?
Scilab 6.1.0 Console
--> 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.

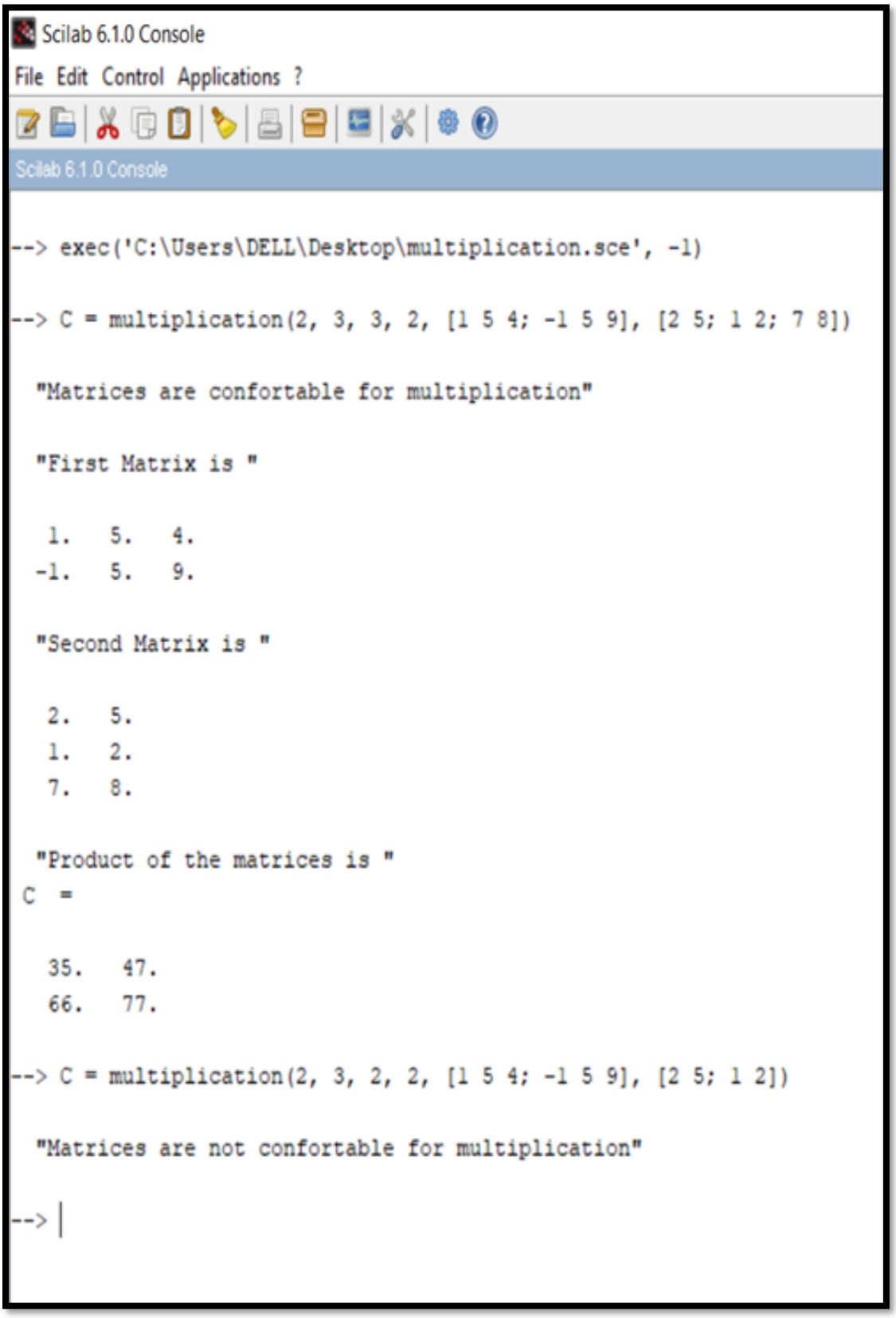
To Find multiplication of two Matrices

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 confortable for multiplication')
else
   disp('Matrices are not confortable 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 ?
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"
-->

Scilab 6.1.0 Console

File Edit Control Applications ?

Scilab 6.1.0 Console

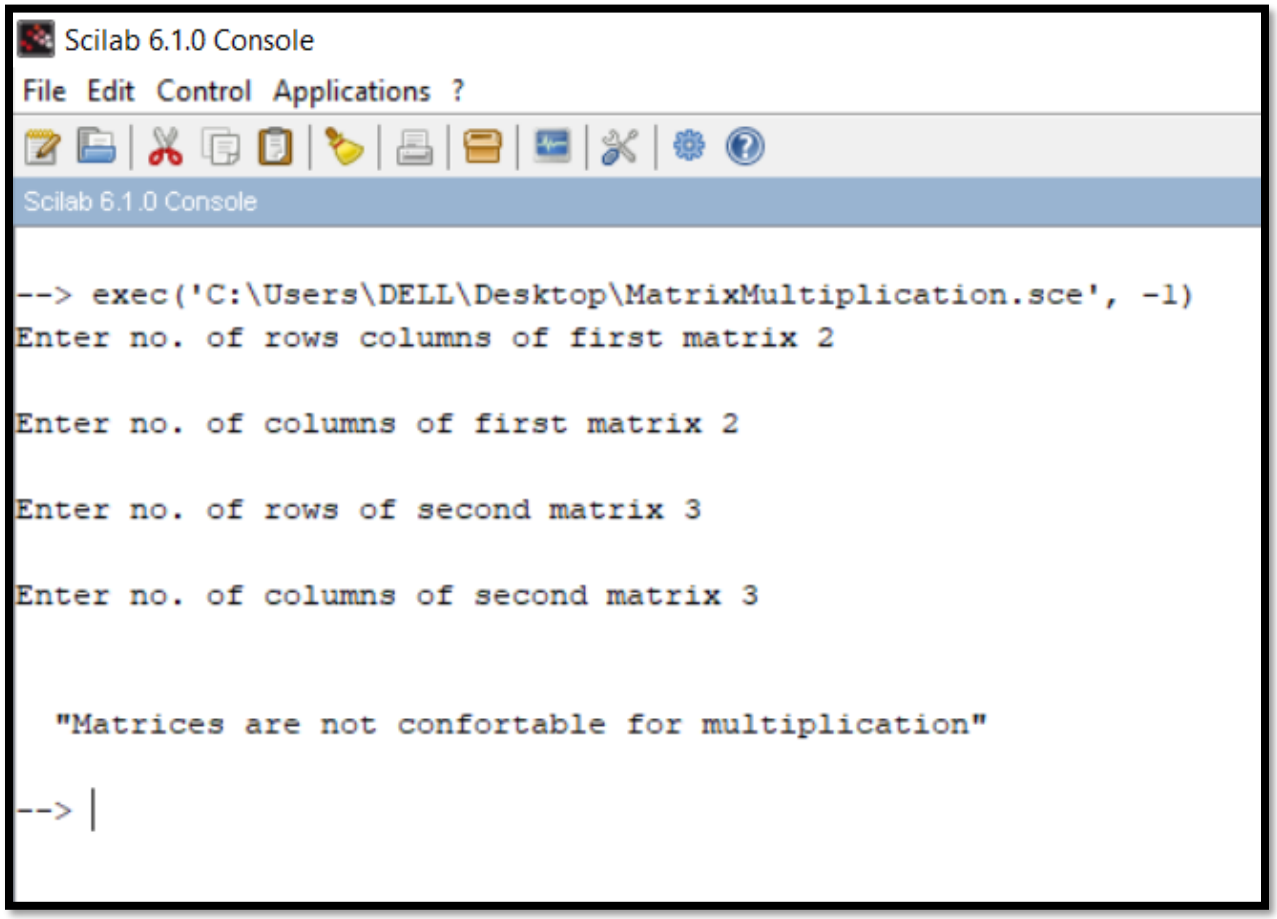
```
--> exec('C:\Users\DELL\Desktop\MatrixMultiplication.sce', -1)
Enter no. of rows columns of first matrix 2

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 confortable 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 confortable for multiplication')
   else
      disp('Matrices are not confortable 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:


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
--> 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 confortable for multiplication"
-->