EXPERIMENT - 3

APPLIED MATHEMATICS LAB

Aim

To find Eigen values and Eigen vectors of a square matrix.

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4C7

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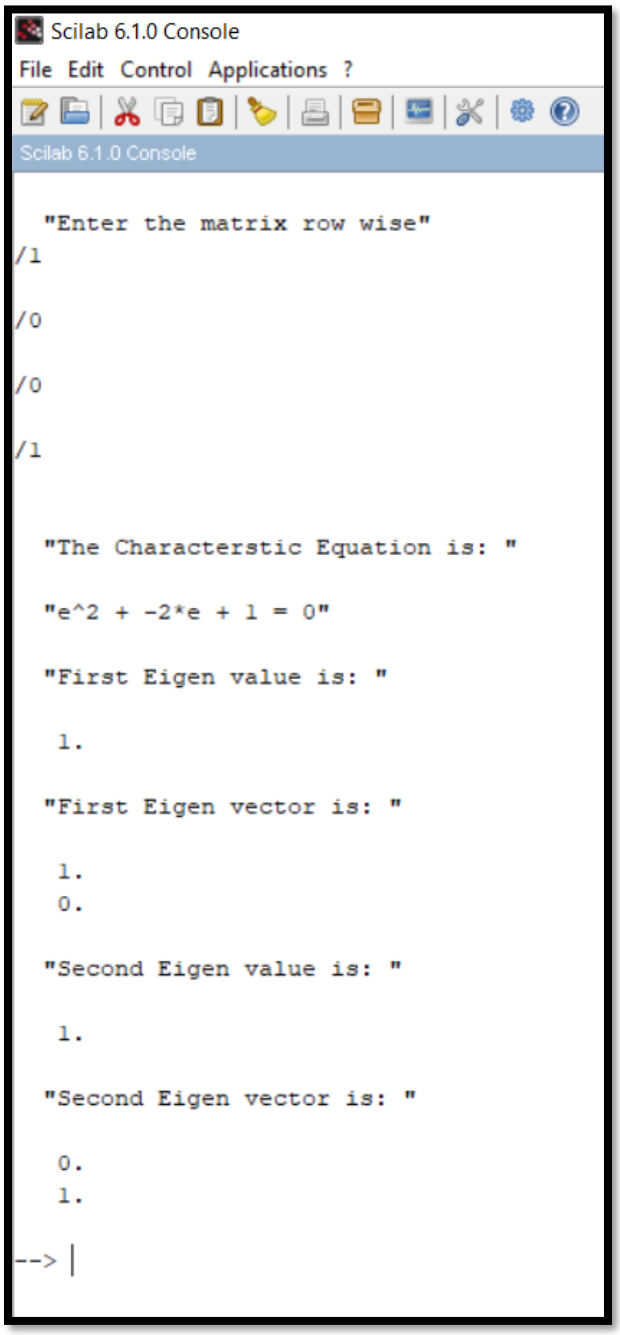
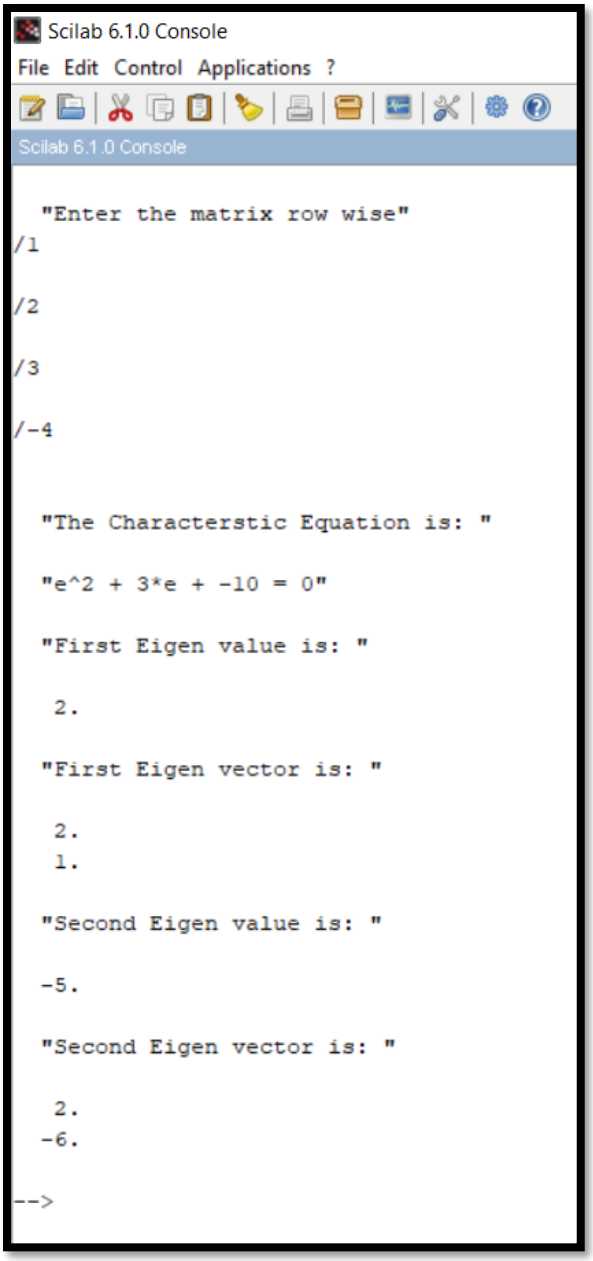
To find Eigen values and Eigen vectors of a square matrix.

Source Code:

```
clc;

printf('\n\n Name - Syeda Reeha Quasar \n Enrolment No. - 14114802719 \n Group - C7 \n\n');
disp("Enter the matrix row wise");

for i = 1:2
   for j = 1:2
      A(i,j) = input('/');
   end
end

trce = A(1, 1) + A(2, 2);
determinant = A(1, 1) * A(2, 2) - A(1, 2) * A(2, 1);

disp("The Characterstic Equation is: ");
disp(['e^2 + ' + string(-trce) + '*e + ' + string(determinant) + ' = 0']);

e1 = (trce + sqrt(trce^2 - 4 * determinant))/2;
e2 = (trce - sqrt(trce^2 - 4 * determinant))/2;

if A(1, 2) ~= 0 then
   v1 = [A(1, 2); e1 - A(1, 1)];
   v2 = [A(1, 2); e2 - A(1, 1)];
elseif A(2, 1) ~= 0 then
   v1 = [e1 - A(2, 2); A(2, 1)];
   v2 = [e2 - A(2, 2); A(2, 1)];
else
   v1 = [1; 0];
   v2 = [0; 1];
end

disp("First Eigen value is: ", e1);
disp("First Eigen vector is: ", v1);
disp("Second Eigen value is: ", e2);
disp("Second Eigen vector is: ", v2);
```

Output:


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
"Enter the matrix row wise"
/1
/0
/0
/1
"The Characterstic Equation is: "
"e^2 + -2*e + 1 = 0"
"First Eigen value is: "
1.
"First Eigen vector is: "
1.
0.
"Second Eigen value is: "
1.
"Second Eigen vector is: "
0.
1.
-->


Scilab 6.1.0 Console
File Edit Control Applications ?
Scilab 6.1.0 Console
"Enter the matrix row wise"
/1
/2
/3
/-4
"The Characterstic Equation is: "
"e^2 + 3*e + -10 = 0"
"First Eigen value is: "
2.
"First Eigen vector is: "
2.
1.
"Second Eigen value is: "
-5.
"Second Eigen vector is: "
2.
-6.
-->