

ESO208a

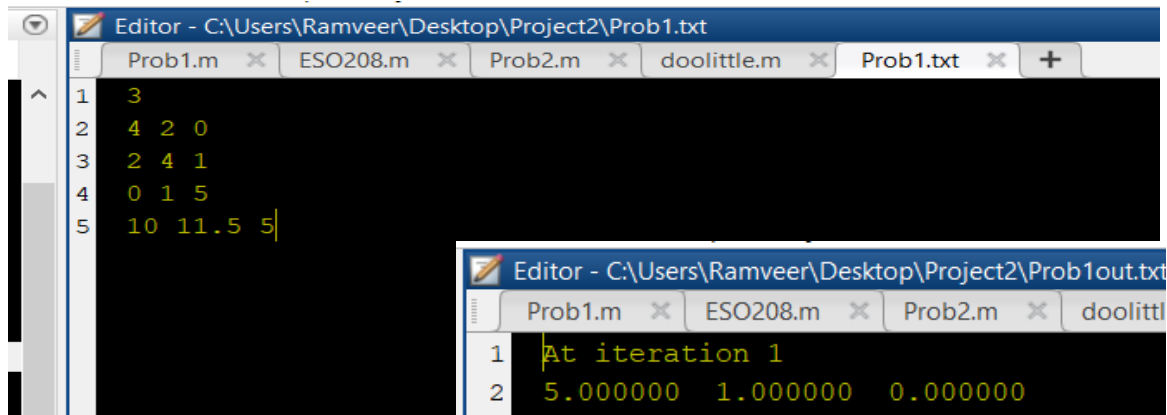
Programming Assignment

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Roll no:-180591

Section:- O5

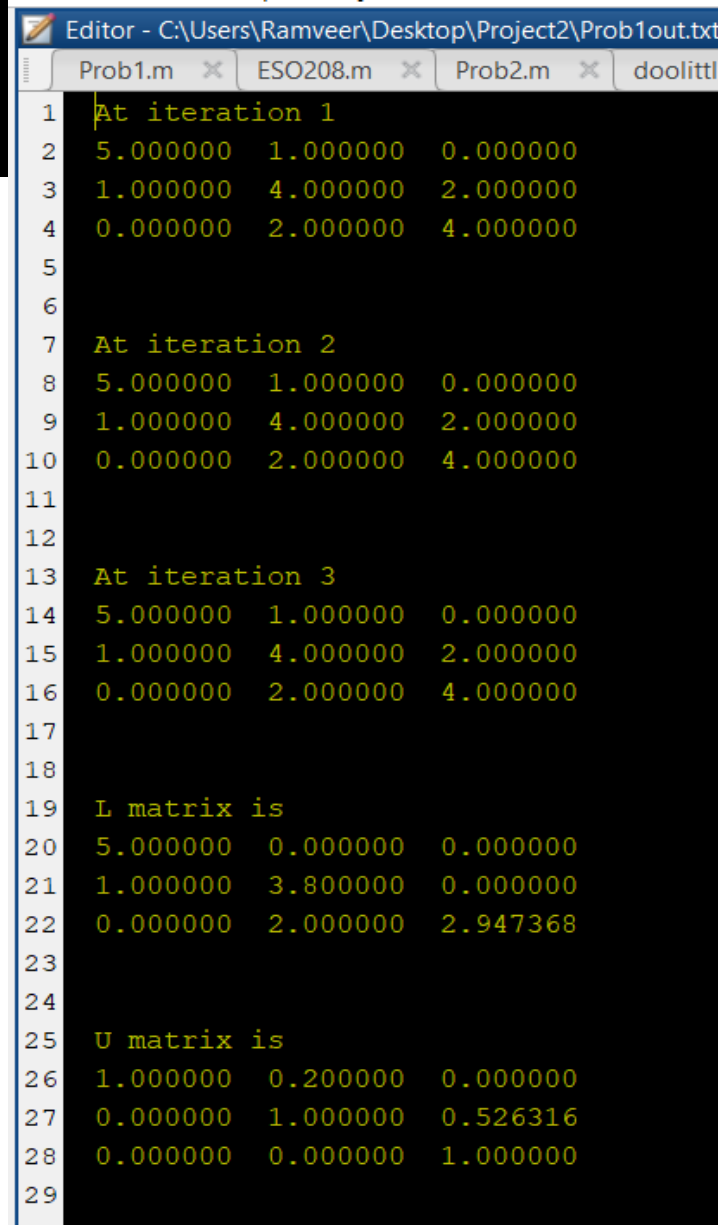
Ques no.1



```
Editor - C:\Users\Ramveer\Desktop\Project2\Prob1.txt
Prob1.m x ESO208.m x Prob2.m x doolittle.m x Prob1.txt x +
1 3
2 4 2 0
3 2 4 1
4 0 1 5
5 10 11.5 5
```

Input File

Crout Method

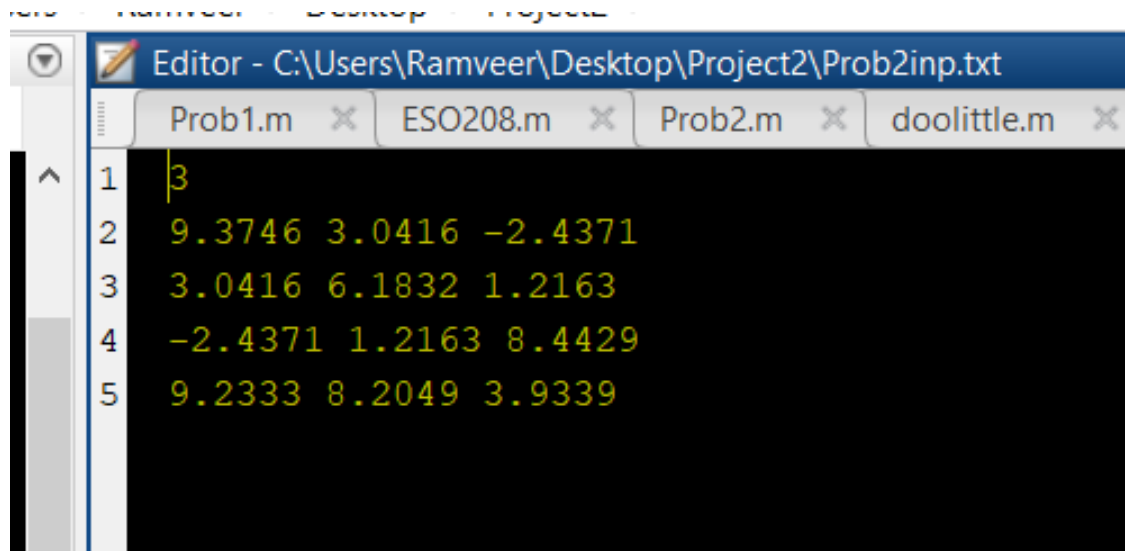


```
Editor - C:\Users\Ramveer\Desktop\Project2\Prob1out.txt
Prob1.m x ESO208.m x Prob2.m x doolittle.m x
1 At iteration 1
2 5.000000 1.000000 0.000000
3 1.000000 4.000000 2.000000
4 0.000000 2.000000 4.000000
5
6
7 At iteration 2
8 5.000000 1.000000 0.000000
9 1.000000 4.000000 2.000000
10 0.000000 2.000000 4.000000
11
12
13 At iteration 3
14 5.000000 1.000000 0.000000
15 1.000000 4.000000 2.000000
16 0.000000 2.000000 4.000000
17
18
19 L matrix is
20 5.000000 0.000000 0.000000
21 1.000000 3.800000 0.000000
22 0.000000 2.000000 2.947368
23
24
25 U matrix is
26 1.000000 0.200000 0.000000
27 0.000000 1.000000 0.526316
28 0.000000 0.000000 1.000000
29
```

Output File

Ques no. 2

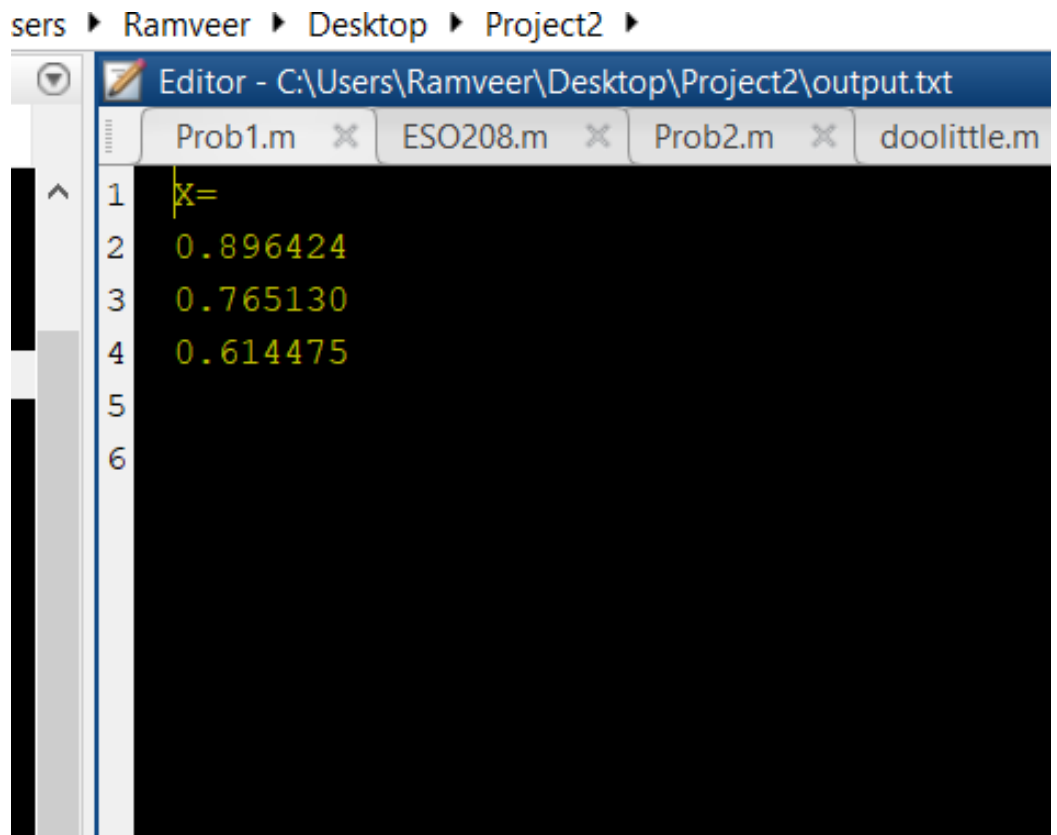
Input



The image shows a MATLAB Editor window with the title bar 'Editor - C:\Users\Ramveer\Desktop\Project2\Prob2inp.txt'. The window contains a 5x4 matrix of numbers. The first column has values 3, 9.3746, 3.0416, -2.4371, and 9.2333. The second column has values 3.0416, 6.1832, 1.2163, 1.2163, and 8.2049. The third column has values -2.4371, 8.4429, and 3.9339. The fourth column is empty. The line numbers 1 through 5 are visible on the left side of the editor.

```
1 3
2 9.3746 3.0416 -2.4371
3 3.0416 6.1832 1.2163
4 -2.4371 1.2163 8.4429
5 9.2333 8.2049 3.9339
```

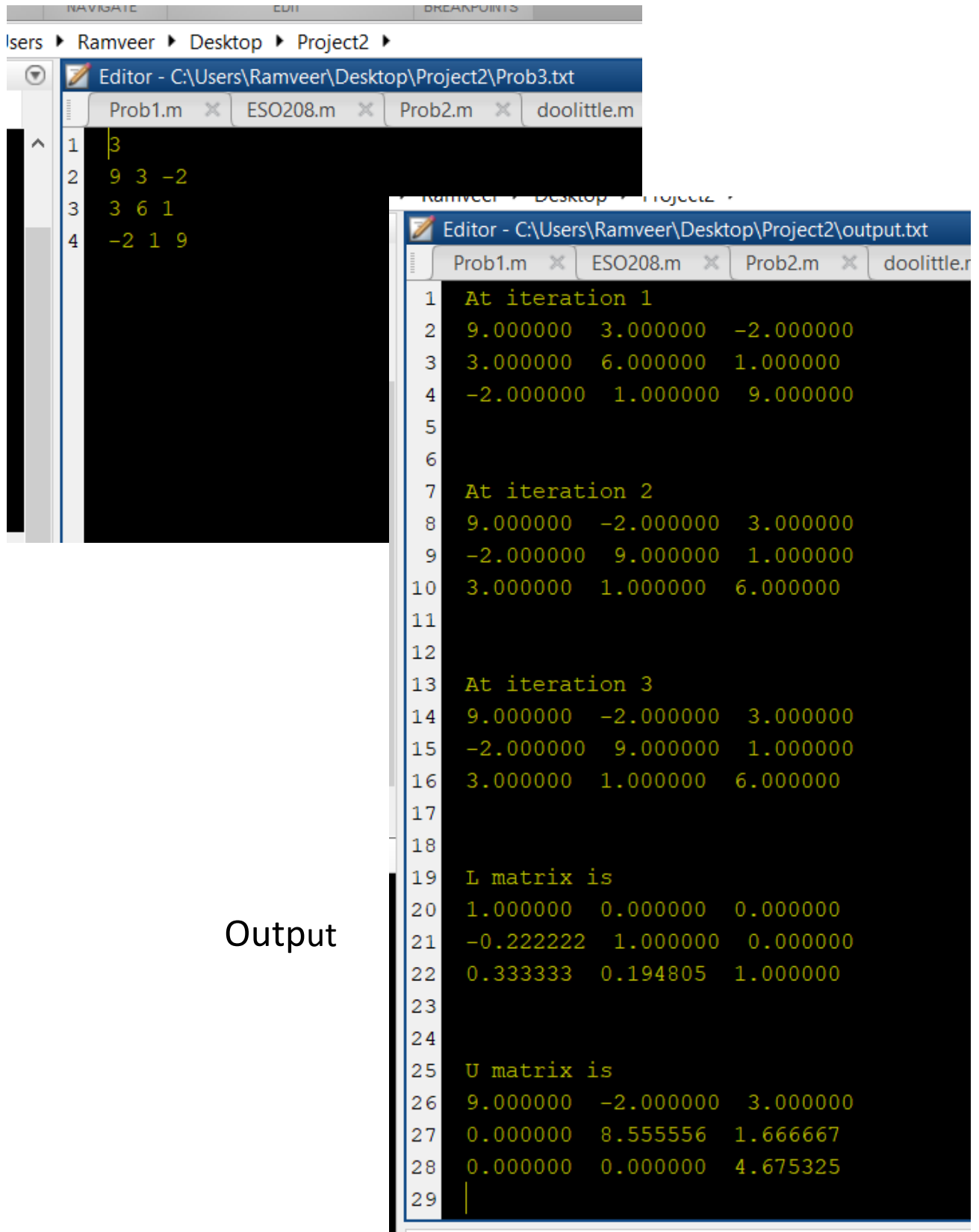
Output



The image shows a MATLAB Editor window with the title bar 'Editor - C:\Users\Ramveer\Desktop\Project2\output.txt'. The window contains a 6x1 column vector of numbers. The first row has the value 'x=' and the subsequent rows have values 0.896424, 0.765130, 0.614475, and three empty rows. The line numbers 1 through 6 are visible on the left side of the editor.

```
1 x=
2 0.896424
3 0.765130
4 0.614475
5
6
```

Ques no. 3



The image shows a code editor window with two tabs: 'Prob3.txt' and 'output.txt'. The 'Prob3.txt' tab is active, showing a 4x4 matrix. The 'output.txt' tab is also visible, showing the output of a program, including iteration results and the L and U matrices.

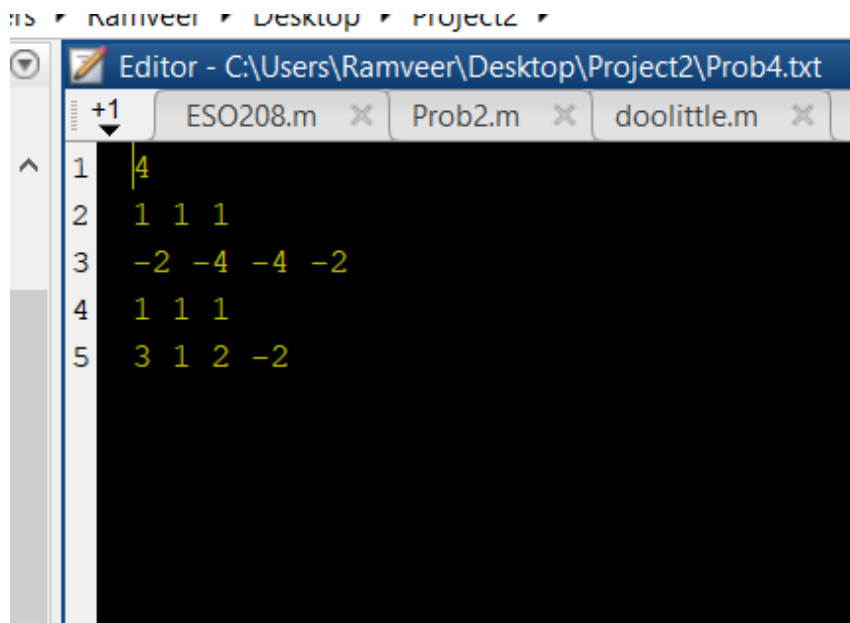
```
Editor - C:\Users\Ramveer\Desktop\Project2\Prob3.txt
1 3
2 9 3 -2
3 3 6 1
4 -2 1 9

Editor - C:\Users\Ramveer\Desktop\Project2\output.txt
1 At iteration 1
2 9.000000 3.000000 -2.000000
3 3.000000 6.000000 1.000000
4 -2.000000 1.000000 9.000000
5
6
7 At iteration 2
8 9.000000 -2.000000 3.000000
9 -2.000000 9.000000 1.000000
10 3.000000 1.000000 6.000000
11
12
13 At iteration 3
14 9.000000 -2.000000 3.000000
15 -2.000000 9.000000 1.000000
16 3.000000 1.000000 6.000000
17
18
19 L matrix is
20 1.000000 0.000000 0.000000
21 -0.222222 1.000000 0.000000
22 0.333333 0.194805 1.000000
23
24
25 U matrix is
26 9.000000 -2.000000 3.000000
27 0.000000 8.555556 1.666667
28 0.000000 0.000000 4.675325
29
```

Output

Ques no. 4

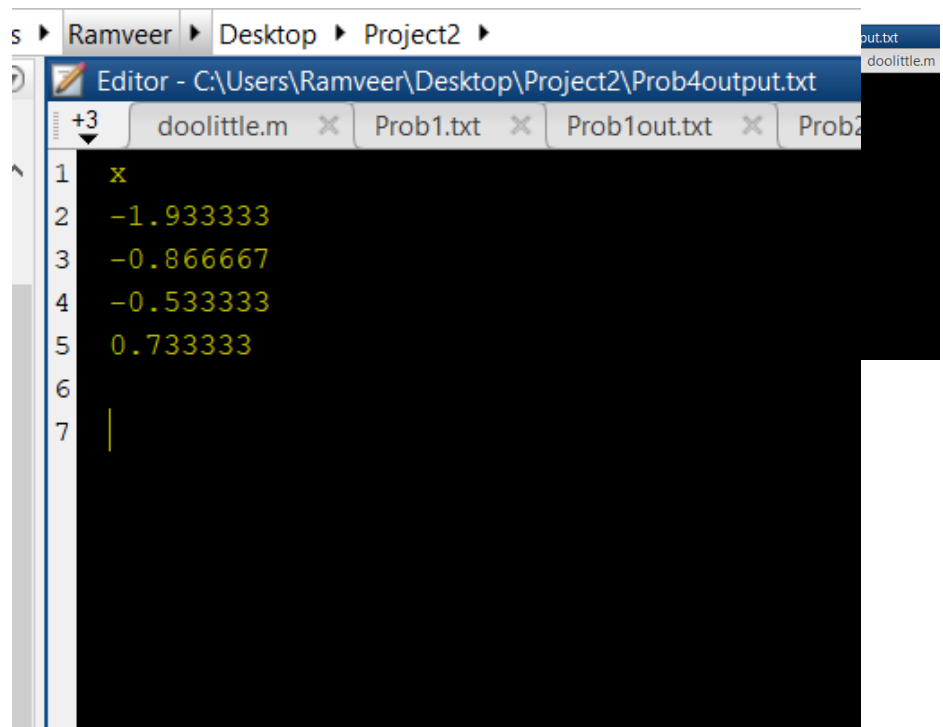
Input



The screenshot shows a text editor window titled "Editor - C:\Users\Ramveer\Desktop\Project2\Prob4.txt". The editor contains five lines of input data for a 5x4 matrix. The first line is the number 4, followed by four rows of four integers each. The tabs at the top show "ESO208.m", "Prob2.m", and "doolittle.m".

```
4
1 1 1
-2 -4 -4 -2
1 1 1
3 1 2 -2
```

Output

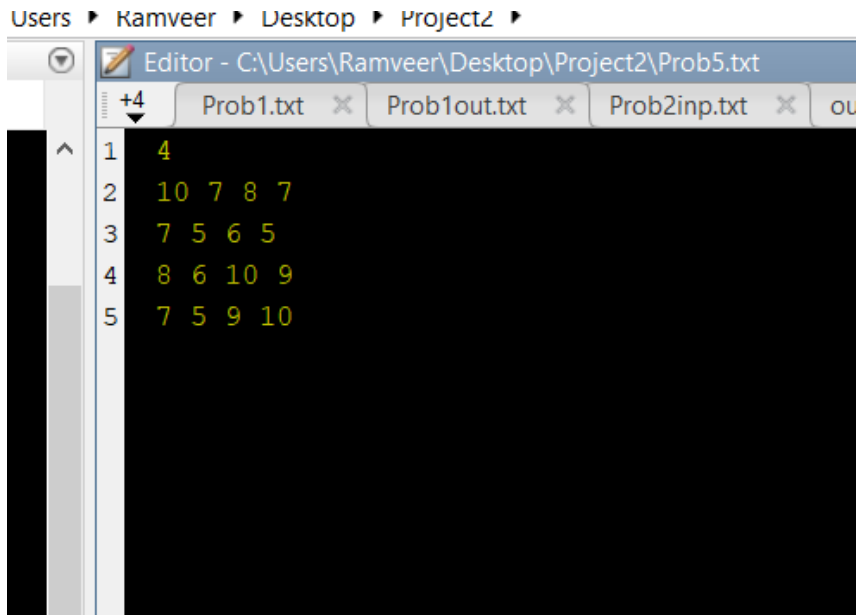


The screenshot shows a text editor window titled "Editor - C:\Users\Ramveer\Desktop\Project2\Prob4output.txt". The editor displays the output of a Gaussian elimination process, showing the pivot element 'x' and the multipliers for each row. The tabs at the top show "doolittle.m", "Prob1.txt", "Prob1out.txt", and "Prob2".

```
x
-1.933333
-0.866667
-0.533333
0.733333
|
```

Ques no. 5

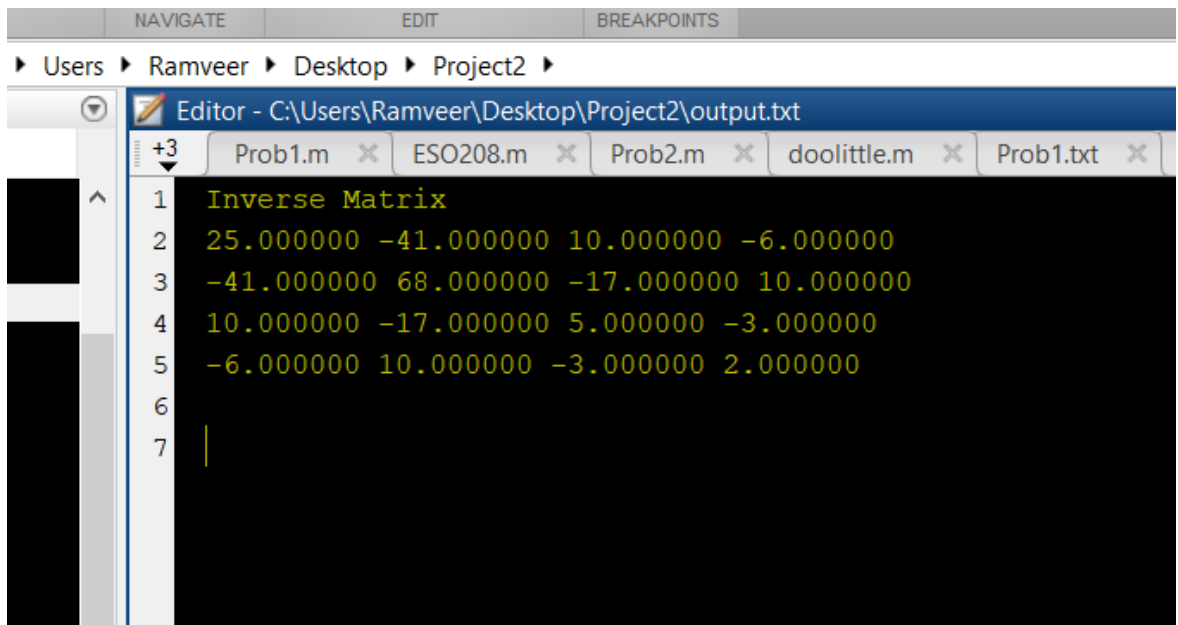
Input



The screenshot shows a text editor window titled "Editor - C:\Users\Ramveer\Desktop\Project2\Prob5.txt". The editor contains five lines of input data:

```
1 4
2 10 7 8 7
3 7 5 6 5
4 8 6 10 9
5 7 5 9 10
```

Output



The screenshot shows a text editor window titled "Editor - C:\Users\Ramveer\Desktop\Project2\output.txt". The editor contains the following output:

```
1 Inverse Matrix
2 25.000000 -41.000000 10.000000 -6.000000
3 -41.000000 68.000000 -17.000000 10.000000
4 10.000000 -17.000000 5.000000 -3.000000
5 -6.000000 10.000000 -3.000000 2.000000
6
7
```

Eigen Values:Ques no. 1

Input

```
Users > Ramveer > Desktop > Project2 >  
Editor - C:\Users\Ramveer\Desktop\Project2\  
+6 EigenProb1.txt Eigenprob1output  
1 4  
2 2 -1 0 0  
3 -1 4 -1 0  
4 0 -1 4 -1  
5 0 0 -1 2  
6 0.001
```

Output(a)

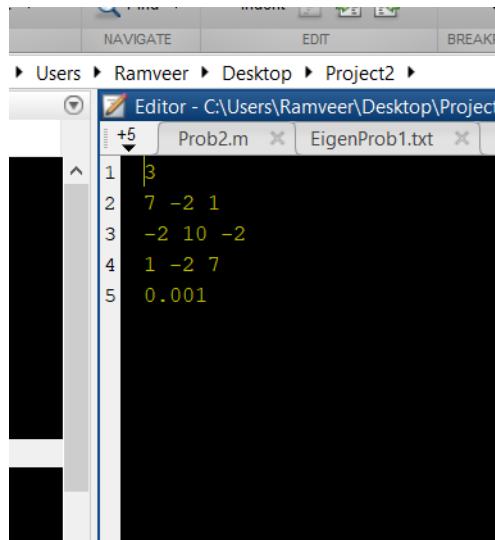
```
NAVIGATE EDIT BREAKPOINTS  
Users > Ramveer > Desktop > Project2 >  
Editor - C:\Users\Ramveer\Desktop\Project2\Eigenprob1out  
+5 Prob2.m EigenProb1.txt Eigenprob1output  
1 Eigenvalues=  
2 5.302753  
3  
4  
5 Eigenvector=  
6 0.205922  
7 -0.678406  
8 0.675122  
9 -0.203893  
10  
11  
12 Iterations  
13 17  
14
```

Output(b)

```
Find Indent Breakpo  
NAVIGATE EDIT BREAKPO  
Users > Ramveer > Desktop > Project2 >  
Editor - C:\Users\Ramveer\Desktop\Project2\  
+5 Prob2.m EigenProb1.txt Ei  
1 Eigenvalues  
2 5.302776  
3 3.618034  
4 1.697204  
5 1.381987  
6  
7  
8 Iterations  
9 =25  
10
```

Eigen Values:Ques no. 2

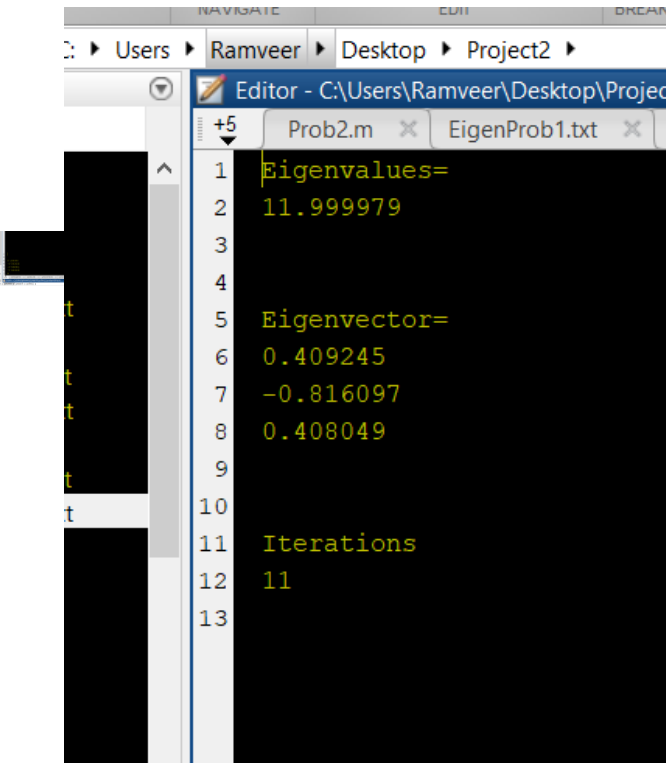
Input



A screenshot of the MATLAB Editor window. The file path is 'C:\Users\Ramveer\Desktop\Project2'. The file 'EigenProb1.txt' is open, showing a 5x5 matrix and a scalar value. The matrix is defined by rows 2 to 5, and the scalar value is 0.001 in row 5.

```
1 3
2 7 -2 1
3 -2 10 -2
4 1 -2 7
5 0.001
```

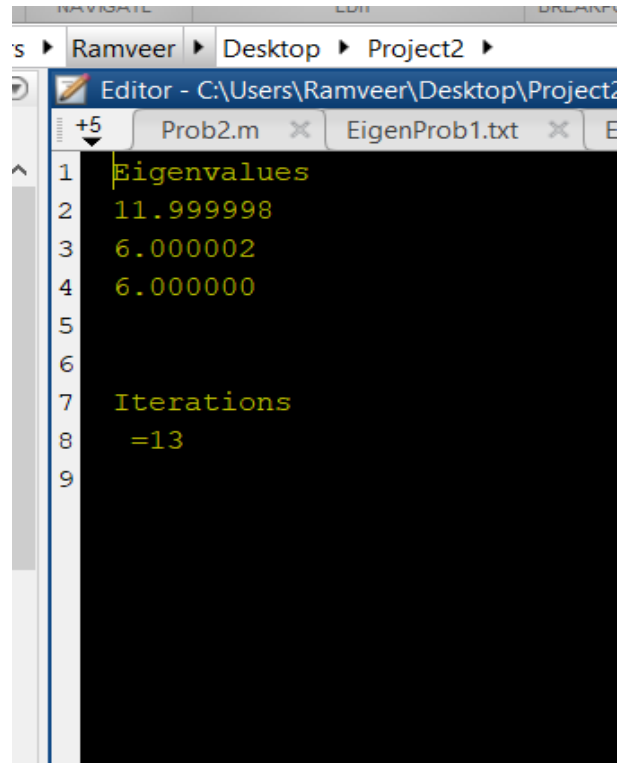
Output(a)



A screenshot of the MATLAB Editor window showing the output of the eigenvalue calculation. The file 'EigenProb1.txt' is open, displaying the eigenvalue, eigenvector, and the number of iterations.

```
1 Eigenvalues=
2 11.999979
3
4
5 Eigenvector=
6 0.409245
7 -0.816097
8 0.408049
9
10
11 Iterations
12 11
13
```

Output(b)

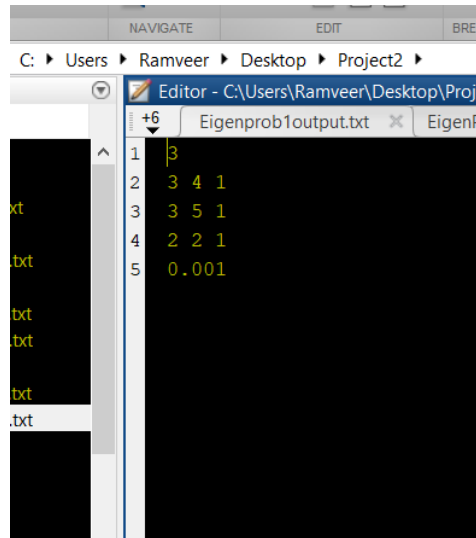


A screenshot of the MATLAB Editor window showing the output of the eigenvalue calculation. The file 'EigenProb1.txt' is open, displaying the eigenvalues and the number of iterations.

```
1 Eigenvalues
2 11.999998
3 6.000002
4 6.000000
5
6
7 Iterations
8 =13
9
```

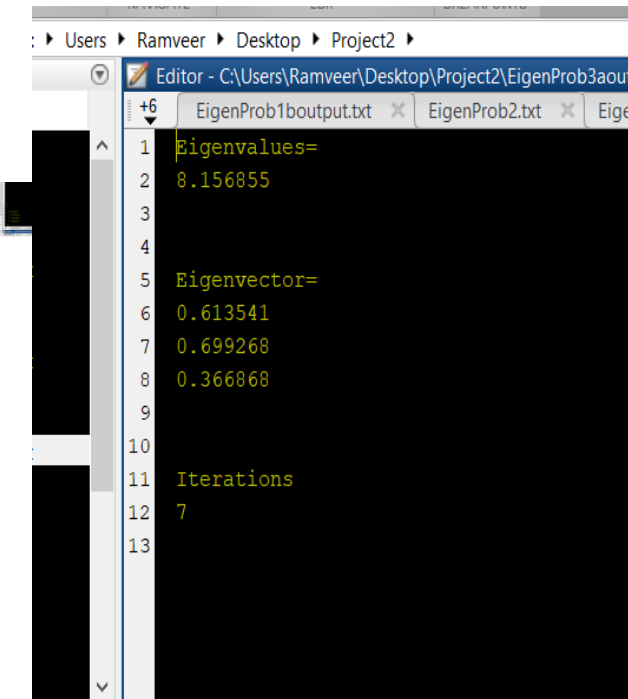

Eigen Values:Ques no. 3

Input



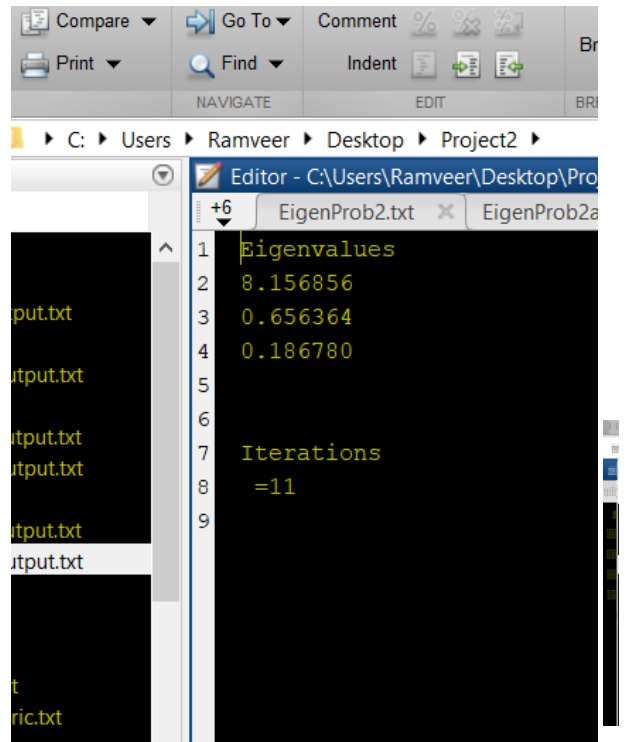
```
1 3
2 3 4 1
3 3 5 1
4 2 2 1
5 0.001
```

Output(a)



```
1 Eigenvalues=
2 8.156855
3
4
5 Eigenvector=
6 0.613541
7 0.699268
8 0.366868
9
10
11 Iterations
12 7
13
```

Output(b)



```
1 Eigenvalues
2 8.156856
3 0.656364
4 0.186780
5
6
7 Iterations
8 =11
9
```