

```
%Define the 3x3 matrix A with all 1's in the first row, all 2's in the
second row,
%and all 3's in the 3rd row.
A=[1,1,1;2,2,2;3,3,3]
```

```
A = 3x3
     1     1     1
     2     2     2
     3     3     3
```

```
%Use the size() function to compute the number of rows and columns of matrix
A.
%Store these quantities as variables numRows and numCols.
size(A)
```

```
ans = 1x2
      3      3
```

```
[numRows,numCols]=size(A)
```

```
numRows = 3
numCols = 3
```

```
%Use the eye() function to create the 4x4 identity matrix. Store this
matrix as I.
I=eye(4)
```

```
I = 4x4
     1     0     0     0
     0     1     0     0
     0     0     1     0
     0     0     0     1
```

```
%Compute the transpose of the matrix A. Store this transposed matrix as the
matrix D.
D=A.'
```

```
D = 3x3
     1     2     3
     1     2     3
     1     2     3
```

```
%lab2
%Create the matrix C.
C=[2,1,3,1;1,2,0,3;-2,2,3,7]
```

```
C = 3x4
     2     1     3     1
     1     2     0     3
    -2     2     3     7
```

```
%Use the rref() command to reduce the matrix C. Store the reduced matrix in
rowreducedC, and
%store the pivot variables in pivotvarsC.
```

```
[rowreducedC, pivotvarsC]= rref(C)
```

```
rowreducedC = 3x4
    1.0000    0    0   -1.0000
         0    1.0000    0    2.0000
         0    0    1.0000    0.3333
pivotvarsC = 1x3
    1    2    3
```

```
%Use the "format rat" option to express elements as ratios.
```

```
format rat
```

```
[rowreducedC, pivotvarsC]= rref(C)
```

```
rowreducedC =
    1          0          0        -1
    0          1          0         2
    0          0          1       1/3
pivotvarsC =
    1          2          3
```

```
%lab3
```

```
%Create the coefficient matrix A.
```

```
clc
```

```
A=[1,3,-2,0,2,0;2,6,-5,-2,4,-3;0,0,1,5,0,3;1,3,0,4,2,9]
```

```
A =
    1          3         -2          0          2          0
    2          6         -5         -2          4         -3
    0          0          1          5          0          3
    1          3          0          4          2          9
```

```
%Create the column matrix b of constants. Remember, to create a column
matrix, the rows are separated
%by semicolons.
```

```
b=[0;-1;1;3]
```

```
b =
    0
   -1
    1
    3
```

```
%Create the augmented matrix [A | b]. Store this augmented matrix in Ab.
```

```
Ab=[A b]
```

```
Ab =
    1          3         -2          0          2          0          0
    2          6         -5         -2          4         -3         -1
    0          0          1          5          0          3          1
    1          3          0          4          2          9          3
```

```
%Use the rref() command to reduce the augmented matrix. Store the reduced
matrix in rowreducedAb, and
```

```
%store the pivot variables in pivotvarsAb.
```

```
[rowreducedAb, pivotvarsAb]=rref(Ab)
```

```
rowreducedAb =
```

1	3	0	0	2	0	0
0	0	1	0	0	0	0
0	0	0	1	0	0	0
0	0	0	0	0	1	1/3

pivotvarsAb =

1	3	4	6
---	---	---	---

```
%Warning: Look carefully at the reduced augmented matrix. If one of the
pivot columns is the rightmost
%column, the system of linear equation has no solution and no further
analysis is possible.
```

```
%Do you run into any difficulties? Explain what is happening as a comment
in your code.
```

```
%Since the number of variables is less than the number of equations there
is no solution for the system of equations. in this case the number of
variables is 6 while the number of equations is four
```

```
%Use the size command to find the number of variables in the system of
linear equations. Store this number
```

```
%in numvars.
```

```
[numeqns, numvars] = size(A)
```

```
numeqns =
```

```
4
```

```
numvars =
```

```
6
```

```
%Use the size command to find the number of pivot variables. Store this
number in numpivotvars.
```

```
[numrows, numpivotvars] = size(pivotvarsAb)
```

```
numrows =
```

```
1
```

```
numpivotvars =
```

```
4
```

```
%Use subtraction to find the number of free variables in the solution to the
system of linear equations.
```

```
%Store this number in numfreevars.
```

```
numfreevars = numvars - numpivotvars
```

```
numfreevars =
```

```
2
```