

Matlab Tutorial

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Introduction Matlab Basic Commands

Matlab is software for Engineering Calculation.

The main window is command window with command prompt '>>'

The basic and important Matlab command is listed below:

Assigning value to a Variable:

```
>>x=5
```

```
>>y = x+4
```

To Define a Row Matrix of size 1x6:

```
>>A = [1 2 3 4 5 6]
```

Defining a Row Matrix without display of answer variable (use semicolon at the end of command):

```
>>B = [1 3 3 7 5 6];
```

To Define a Column Matrix of size 6x1:

```
>>C = [1;2;3;4;5;6]
```

To Define a Square Matrix of size 6x6:

```
>>D = [1 2 3 2 7 3;2 8 7 4 3 4;0 1 9 8 6 4;9 6 5 4 3 3;3 4 5 1 2 7;9 8 7  
0 5 1]
```

Finding Transpose of Matrix:

```
>>D'
```

Finding the Determinant of Matrix:

```
>>det(D)
```

Finding Inverse of Matrix:

```
>>inv(D)
```

Another command of Matrix Inverse is:

```
>>D^-1
```

Note: Caret (^) symbol is used for taking power.

To find the Matrix Multiplication and store result in Matrix E (6x1):

```
>>E=D*C
```

To find the inverse of square matrix D and multiply with Matrix C:

```
>>F=D^-1*C
```

Another way of above calculation is:

```
>>G=inv(D)*C
```

Third method of above calculation is:

```
>>H=D\C
```

To define a Null Matrix 5x4 size:

```
>>I = zeros(5,4)
```

To define a Square Null Matrix of 6x6 size:

```
>>J=zeros(6)
```

To define the Identity Matrix of size 6x6:

```
>>K=eye(6)
```

To define a Row Matrix with elements from 1 to 10 with step size of 0.05:

```
>>L = [1:0.05:10]
```

To clear the display of command window:

```
>>clc
```

To save only variable C,F and G to Workspace file named myvar1.mat:

```
>> save('myvar1.mat','C','F','G')
```

To save all variables to workspace named myvar2.mat:

```
>>save myvar2.mat
```

To remove variable A, B, and D from Workspace:

```
>>clear('A','B','D')
```

To clear all variables from Matlab Workspace:

```
>>clear all
```

To load only variable H and I from myvar2.mat file:

```
>>load('myvar2.mat','H','I')
```

To load all variable from myvar2.mat file:

```
>>load myvar2.mat
```

To find the sine of given matrix:

```
>>M = 2*sin(L);
```

Note: Angle Input is taken as radian.

To perform scalar multiplication of matrix A and B:

```
>>N = A.*B
```

Note: dot (.) symbol is used for element wise operation.

To plot to arrays:

```
>>plot(L,M)
```

To plot with dot marker:

```
>>plot(L,M, '.')
```

To plot with asterisk (*) marker and line of red color:

```
>>plot(L,M, '*-r')
```

To perform complex number calculation on a and b:

```
>> a = 2 + 5i;
```

```
>>b = 9 + 6j;
```

```
>>a+b
```

```
>>a-b
```

```
>>a*b
```

```
>>a/b
```

To open M file Editor: Desktop>Editor

Save a new file by the name cmr.m and write the following:

```
% Cramer Rule Calc
```

```
A=input('Enter a Square Matrix of Size mxm');
```

```
B=input('Enter a Column Matrix of Size mx1');
```

```
X=A\B;
```

```
disp('X (mx1) is :')
```

```
disp(X)
```

To execute above m file, write: cmr in command window.

Following is the code of qdr.m file for Quadratic Equation:

```
%quadratic root calc using quadratic formula:  
a=input('Enter the coefficient of quadratic equation - a = ');  
b=input('Enter the coefficient of quadratic equation - b = ');  
c=input('Enter the coefficient of quadratic equation - c = ');  
x1=(-b+sqrt(b^2-4*a*c))/(2*a)  
x2=(-b-sqrt(b^2-4*a*c))/(2*a)
```

To find help of given command:

```
>>help det
```