

This is all about the basics of MATLAB

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```
% this is how we can check current matlab version and date  
version
```

```
ans =  
'9.10.0.1669067 (R2021a) Update 2'
```

```
date
```

```
ans =  
'05-Jun-2021'
```

```
%this is how we can define variables in MATLAB
```

```
var = 10;  
disp(var);
```

```
10
```

```
% MATLAB size function  
size(var)
```

```
ans = 1×2  
1 1
```

```
% Doing some basic math in MATLAB'
```

```
a = 10;  
b = 20;  
a + b
```

```
ans = 30
```

```
a - b
```

```
ans = -10
```

```
a / b
```

```
ans = 0.5000
```

```
a ^ 3
```

```
ans = 1000
```

```
% ans => temporary variable  
ans
```

```
ans = 1000
```

```
ans - ans
```

```
ans = 0
```

```
% predefined values
```

```
pi
```

```
ans = 3.1416
```

```
format long;
pi
```

```
ans =
    3.141592653589793
```

```
format short;
pi
```

```
ans = 3.1416
```

```
% complex number
% we can use i and j interchangeably
c = 10 + 20i;
disp(c);
```

```
10.0000 +20.0000i
```

```
c = 20 + 30j;
c
```

```
c = 20.0000 + 30.0000i
```

```
% get the abs value
c = 3 + 4i;
abs(c)
```

```
ans = 5
```

```
% vectors
A = [1, 2, 3, 4, 5];
disp(A);
```

```
1      2      3      4      5
```

```
B = A'
```

```
B = 5x1
    1
    2
    3
    4
    5
```

```
% this is a skew sym matrix:  A - A'
A - B
```

```
ans = 5x5
    0     1     2     3     4
   -1     0     1     2     3
   -2    -1     0     1     2
   -3    -2    -1     0     1
   -4    -3    -2    -1     0
```

```
C = transpose(B)
```

```
C = 1x5
    1     2     3     4     5
```

```
A == C
```

```
ans = 1x5 logical array  
    1    1    1    1    1
```

```
A - C
```

```
ans = 1x5  
    0    0    0    0    0
```

```
A = [1 2 3;  
     4 5 6;  
     7 8 9]
```

```
A = 3x3  
     1     2     3  
     4     5     6  
     7     8     9
```

```
det(A)
```

```
ans = -9.5162e-16
```

```
% check all variables in the workspace  
who
```

Your variables are:

```
A      B      C      a      ans      b      c      my_var  q      v      var
```

```
whos
```

| Name | Size | Bytes | Class | Attributes |
|--------|------|-------|--------|------------|
| A | 3x3 | 72 | double | |
| B | 5x1 | 40 | double | |
| C | 1x5 | 40 | double | |
| a | 1x1 | 8 | double | |
| ans | 1x1 | 8 | double | |
| b | 1x1 | 8 | double | |
| c | 1x1 | 16 | double | complex |
| my_var | 1x1 | 8 | double | |
| q | 1x4 | 32 | double | |
| v | 1x4 | 32 | double | |
| var | 1x1 | 8 | double | |

```
% element wise vector opn
```

```
v = [1, 2, 3, 4];  
q = [4, 5, 6, 7];
```

```
v + q
```

```
ans = 1x4  
     5     7     9    11
```

```
v - q
```

```
ans = 1x4  
    -3    -3    -3    -3
```

```
v .^ q
```

```
ans = 1x4  
      1      32      729     16384
```

```
v .* q
```

```
ans = 1x4  
      4     10     18     28
```

```
v ./ q
```

```
ans = 1x4  
  0.2500  0.4000  0.5000  0.5714
```

```
% working with matrices
```

```
M = [1, 2, 3; 2, 3, 4; 3, 4, 5];  
disp(M * M);
```

```
14    20    26  
20    29    38  
26    38    50
```

```
disp(M .* M);
```

```
1     4     9  
4     9    16  
9    16    25
```

```
% inverse of a matrix
```

```
inv(M);
```

```
Warning: Matrix is close to singular or badly scaled. Results may be inaccurate. RCOND = 4.625929e-18.
```

```
M ^ -1
```

```
Warning: Matrix is close to singular or badly scaled. Results may be inaccurate. RCOND = 4.625929e-18.
```

```
ans = 3x3  
1015 x  
 -2.2518    4.5036   -2.2518  
  4.5036   -9.0072    4.5036  
 -2.2518    4.5036   -2.2518
```

```
% get the eigen value
```

```
[V, D] = eig(M);  
disp(V);
```

```
0.8277    0.4082    0.3851  
0.1424   -0.8165    0.5595  
-0.5428    0.4082    0.7339
```

```
disp(D);
```

```
-0.6235     0     0  
0   -0.0000     0  
0     0    9.6235
```

```
O = ones(3, 5);  
Z = zeros(4, 6);
```

```
0
```

```
0 = 3×5
```

```
1    1    1    1    1
1    1    1    1    1
1    1    1    1    1
```

```
Z
```

```
Z = 4×6
```

```
0    0    0    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0
```

```
pi
```

```
ans = 3.1416
```

```
sin(pi)
```

```
ans = 1.2246e-16
```

```
cos(pi)
```

```
ans = -1
```

```
sqrt(5)
```

```
ans = 2.2361
```

```
X = [4, 9, 16, 25, 36];
sqrt(X)
```

```
ans = 1×5
```

```
2    3    4    5    6
```

```
myName = "Akash Maji";
disp(myName)
```

```
Akash Maji
```

```
% myName(3)
myNameAgain = 'akash maji';
myNameAgain(3)
```

```
ans =
'a'
```

```
%% End of Notebook
```