```
%TUTORIAL ONE

addition = 3+3;
substraction = 3-1;
mult = 2*3;
divi = 10/2;
power = 2^10;
square = sqrt(10);

a = [1 2 3; 4 5 6]; %matrix of 2 rows (2x1)

b = rand(2,2); %matrix (2x2) containing random numbers between 0 and 1

w = -6 + sqrt(10) + randn(1,10000); %matrix of (1X10000);
%fig1 = hist(w,50)

q = ones(2,3); %Ones  Vectors
q1 = zeros(3,2); %Zeros Vector
q2 = eye(5); %Identity vector

help eye; %if we want elp for any function


%TUTORIAL TWO

a1 = [1 2; 3 4; 5 6];
size(a1);
size(size(a1));

v = [1 2 3 4];
length(v);
length(a1);

length([1;2;3;4]);

pwd; %to check the directory

aa = who; %checking Variables
aa;

aaa = whos; %checing details of variables
aaa;

who
A = [1 2; 3 4; 5 6];
A;
size(A);
A(1,1); %element in first row and first column

A(3,:);%every element along third row
A(:,2);%every element along second column
```

```
A([1 3],:); %get row element from first and third rows and of all columns
A;

A(:,2) = [10; 11; 12]; %changing elements
A= [A,[100;200;300]];% adding extra column
A(:,3);

B = A(:); %adding all element of A in vector B
B;


a11 = [1 2; 3 4; 5 6];
b11 = [11 12; 13 14; 15 16];
c11 = [a11 b11]%concatinating Two Matrices(side by side)

c12 = [a11;b11] %(b11 at bottom)


%Tutorial Three.
A = [1 2; 3 4;5 6];
A

B = [11 12; 13 14; 15 16];
B

C = [1 1; 2 2];

A*C

A.*B %Element wise multiplication

A.^2 %Element wise square

v =[1; 2; 3]
1./v %element wise resi

exp(v) %Element wise exponential

abs(v) %element wise abs values

v + ones(3,1) %incrementing element of V by one

v + 1

%A transpose
A' %transpose of A

(A')'

z = [1 15 2 0.5]
val=max(z)

[val, ind] = max(z) %position of maximum element
```

```
a
a<3 %outputs 1 where element is less than 3

find(a<3)



A = magic(3)

[r,c] = find(A>=7)

a
sum(a)
prod(a)

A
max(A,[],1)%column wise max
max(A,[],2)%max of rowm

max(max(A)) %Max of complete metrix

eye(5)*magic(5)*eye(5)

A = magic(3)

b = pinv(A)

temp = pinv(A)
temp*A



%Tutorial Four

t = [0:0.01:0.98]
y1 = sin(2*pi*4*t)
plot(t,y1)
y2 = cos(2*pi*4*t)
plot(t,y2)

hold on;
plot(t,y2,'r')
xlabel('Time')
ylabel('Values')
title('plot sample')

legend('sin','cos')
print -dpng 'myplot.png'

close
```

```
figure(1); plot(t,y1);
figure(2); plot(t,y2);

subplot(1,2,1); %first plot of two in first row
plot(t,y2);
subplot(1,2,2);%second plot of two in first row
plot(t,y1);

axis([0.10 1 -1 1])

clf

g = magic(5)

imagesc(g)
imagesc(g),colorbar,colormap gray

imagesc(magic(15)),colorbar, colormap gray

a=1, b=1, c=3

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



%Tutorial FIVE

v = zeros(10,1);


for i = 1:10,
    v(i) =2^i;
end;

v

indices = 1:10;
indices

for i = indices,
    disp(2*i)
end;

i  = 1;
while i <=5,
    v(i)=100;
    i = i+1;
end;
v

i = 1;
while true,
    v(i)=999;
    i = i+1;
```

```
    if i ==6,
        break
    end;
end;

v

v(1) =2;
if v(1) ==1,
    disp('The value is One');
elseif v(1)==2,
    disp('The Value is Two');
else
    disp('Nothing')
end;



%Functions in Matlab
x = [1 1; 1 2; 1 3];
x

y = [1; 2; 3];
theta = [0;0];

j = cost(x,y,theta)


%Tutorial FIVE

%sum of (theta(j),x(j)) from 0 to n --> can be written as (thetatranspose*x)
theta = [1; 2; 3; 4];
x_val = [11;12;13;14];
transpose_theta = theta';

hypothesis = transpose_theta * x_val;

 EYE Identity matrix.
    EYE(N) is the N-by-N identity matrix.

    EYE(M,N) or EYE([M,N]) is an M-by-N matrix with 1's on
    the diagonal and zeros elsewhere.

    EYE(SIZE(A)) is the same size as A.

    EYE with no arguments is the scalar 1.

    EYE(..., CLASSNAME) is a matrix with ones of class specified by
    CLASSNAME on the diagonal and zeros elsewhere.

    EYE(..., 'like', Y) is an identity matrix with the same data type,
 sparsity,
    and complexity (real or complex) as the numeric variable Y.
```

```
    Note: The size inputs M and N should be nonnegative integers.
    Negative integers are treated as 0.

    Example:
       x = eye(2,3,'int8');

    See also SPEYE, ONES, ZEROS, RAND, RANDN.

    Documentation for eye
       doc eye


Your variables are:

A               b11             power           v
B               c               q               val
C               c11             q1              w
a               c12             q2              x
a1              divi            r               x_val
a11             g               square          y
aa              i               substraction    y1
aaa             ind             t               y2
addition        indices         temp            z
ans             j               theta
b               mult            transpose_theta


c11 =

     1     2    11    12
     3     4    13    14
     5     6    15    16


c12 =

     1     2
     3     4
     5     6
    11    12
    13    14
    15    16


A =

     1     2
     3     4
     5     6


B =
```

```
    11    12
    13    14
    15    16


ans =

     5     5
    11    11
    17    17


ans =

    11    24
    39    56
    75    96


ans =

     1     4
     9    16
    25    36


v =

     1
     2
     3


ans =

    1.0000
    0.5000
    0.3333


ans =

    2.7183
    7.3891
   20.0855


ans =

     1
     2
     3
```

```
ans =

     2
     3
     4


ans =

     2
     3
     4


ans =

     1     3     5
     2     4     6


ans =

     1     2
     3     4
     5     6


z =

    1.0000   15.0000    2.0000    0.5000


val =

    15


val =

    15


ind =

     2


a =

     1     2     3
     4     5     6


ans =
```

```
  2×3 logical array

   1   1   0
   0   0   0


ans =

     1
     3


A =

     8     1     6
     3     5     7
     4     9     2


r =

     1
     3
     2


c =

     1
     2
     3


a =

     1     2     3
     4     5     6


ans =

     5     7     9


ans =

     4    10    18


A =

     8     1     6
     3     5     7
```

```
     4     9     2


ans =

     8     9     7


ans =

     8
     7
     9


ans =

     9


ans =

    17    24     1     8    15
    23     5     7    14    16
     4     6    13    20    22
    10    12    19    21     3
    11    18    25     2     9


A =

     8     1     6
     3     5     7
     4     9     2


b =

    0.1472   -0.1444    0.0639
   -0.0611    0.0222    0.1056
   -0.0194    0.1889   -0.1028


temp =

    0.1472   -0.1444    0.0639
   -0.0611    0.0222    0.1056
   -0.0194    0.1889   -0.1028


ans =

    1.0000    0.0000   -0.0000
   -0.0000    1.0000    0.0000
```

```
    0.0000   -0.0000    1.0000

t =

  Columns 1 through 7

         0    0.0100    0.0200    0.0300    0.0400    0.0500    0.0600

  Columns 8 through 14

    0.0700    0.0800    0.0900    0.1000    0.1100    0.1200    0.1300

  Columns 15 through 21

    0.1400    0.1500    0.1600    0.1700    0.1800    0.1900    0.2000

  Columns 22 through 28

    0.2100    0.2200    0.2300    0.2400    0.2500    0.2600    0.2700

  Columns 29 through 35

    0.2800    0.2900    0.3000    0.3100    0.3200    0.3300    0.3400

  Columns 36 through 42

    0.3500    0.3600    0.3700    0.3800    0.3900    0.4000    0.4100

  Columns 43 through 49

    0.4200    0.4300    0.4400    0.4500    0.4600    0.4700    0.4800

  Columns 50 through 56

    0.4900    0.5000    0.5100    0.5200    0.5300    0.5400    0.5500

  Columns 57 through 63

    0.5600    0.5700    0.5800    0.5900    0.6000    0.6100    0.6200

  Columns 64 through 70

    0.6300    0.6400    0.6500    0.6600    0.6700    0.6800    0.6900

  Columns 71 through 77

    0.7000    0.7100    0.7200    0.7300    0.7400    0.7500    0.7600

  Columns 78 through 84

    0.7700    0.7800    0.7900    0.8000    0.8100    0.8200    0.8300

  Columns 85 through 91
```

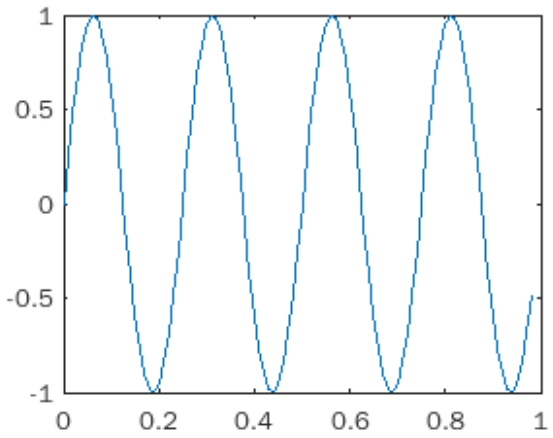
```
    0.8400    0.8500    0.8600    0.8700    0.8800    0.8900    0.9000
  Columns 92 through 98
    0.9100    0.9200    0.9300    0.9400    0.9500    0.9600    0.9700
  Column 99
    0.9800

y1 =
  Columns 1 through 7
         0    0.2487    0.4818    0.6845    0.8443    0.9511    0.9980
  Columns 8 through 14
    0.9823    0.9048    0.7705    0.5878    0.3681    0.1253   -0.1253
  Columns 15 through 21
   -0.3681   -0.5878   -0.7705   -0.9048   -0.9823   -0.9980   -0.9511
  Columns 22 through 28
   -0.8443   -0.6845   -0.4818   -0.2487   -0.0000    0.2487    0.4818
  Columns 29 through 35
    0.6845    0.8443    0.9511    0.9980    0.9823    0.9048    0.7705
  Columns 36 through 42
    0.5878    0.3681    0.1253   -0.1253   -0.3681   -0.5878   -0.7705
  Columns 43 through 49
   -0.9048   -0.9823   -0.9980   -0.9511   -0.8443   -0.6845   -0.4818
  Columns 50 through 56
   -0.2487   -0.0000    0.2487    0.4818    0.6845    0.8443    0.9511
  Columns 57 through 63
    0.9980    0.9823    0.9048    0.7705    0.5878    0.3681    0.1253
  Columns 64 through 70
   -0.1253   -0.3681   -0.5878   -0.7705   -0.9048   -0.9823   -0.9980
```

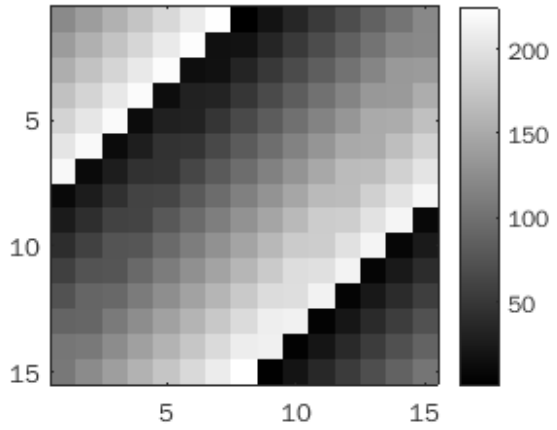
```
  Columns 71 through 77

   -0.9511   -0.8443   -0.6845   -0.4818   -0.2487   -0.0000    0.2487

  Columns 78 through 84

    0.4818    0.6845    0.8443    0.9511    0.9980    0.9823    0.9048

  Columns 85 through 91

    0.7705    0.5878    0.3681    0.1253   -0.1253   -0.3681   -0.5878

  Columns 92 through 98

   -0.7705   -0.9048   -0.9823   -0.9980   -0.9511   -0.8443   -0.6845

  Column 99

   -0.4818

y2 =

  Columns 1 through 7

    1.0000    0.9686    0.8763    0.7290    0.5358    0.3090    0.0628

  Columns 8 through 14

   -0.1874   -0.4258   -0.6374   -0.8090   -0.9298   -0.9921   -0.9921

  Columns 15 through 21

   -0.9298   -0.8090   -0.6374   -0.4258   -0.1874    0.0628    0.3090

  Columns 22 through 28

    0.5358    0.7290    0.8763    0.9686    1.0000    0.9686    0.8763

  Columns 29 through 35

    0.7290    0.5358    0.3090    0.0628   -0.1874   -0.4258   -0.6374

  Columns 36 through 42

   -0.8090   -0.9298   -0.9921   -0.9921   -0.9298   -0.8090   -0.6374

  Columns 43 through 49

   -0.4258   -0.1874    0.0628    0.3090    0.5358    0.7290    0.8763

  Columns 50 through 56

    0.9686    1.0000    0.9686    0.8763    0.7290    0.5358    0.3090
```

```
  Columns 57 through 63

    0.0628   -0.1874   -0.4258   -0.6374   -0.8090   -0.9298   -0.9921

  Columns 64 through 70

   -0.9921   -0.9298   -0.8090   -0.6374   -0.4258   -0.1874    0.0628

  Columns 71 through 77

    0.3090    0.5358    0.7290    0.8763    0.9686    1.0000    0.9686

  Columns 78 through 84

    0.8763    0.7290    0.5358    0.3090    0.0628   -0.1874   -0.4258

  Columns 85 through 91

   -0.6374   -0.8090   -0.9298   -0.9921   -0.9921   -0.9298   -0.8090

  Columns 92 through 98

   -0.6374   -0.4258   -0.1874    0.0628    0.3090    0.5358    0.7290

  Column 99

    0.8763

g =

    17    24     1     8    15
    23     5     7    14    16
     4     6    13    20    22
    10    12    19    21     3
    11    18    25     2     9

a =

     1

b =

     1

c =

     3
```

```
A =

     1     2     3
     4     5     6
     7     8     9


v =

           2
           4
           8
          16
          32
          64
         128
         256
         512
        1024


indices =

     1     2     3     4     5     6     7     8     9    10

     2

     4

     6

     8

    10

    12

    14

    16

    18

    20


v =

         100
         100
         100
         100
         100
          64
```

```
         128
         256
         512
        1024


v =

         999
         999
         999
         999
         999
          64
         128
         256
         512
        1024

The Value is Two

x =

     1     1
     1     2
     1     3


j =

    2.3333
```





Published with MATLAB® R2021b