MATLAB Matrix Commands with Sample Input and Output

Create Matrix

Input:
A = [1 2 3; 4 5 6]
Output:
A =
   1   2   3
   4   5   6

Zeros Matrix

Input:
Z = zeros(2,3)
Output:
Z =
   0   0   0
   0   0   0

Ones Matrix

Input:
O = ones(2,2)
Output:
O =
   1   1
   1   1

Identity Matrix

Input:
I = eye(3)
Output:
I =
   1   0   0
   0   1   0
   0   0   1

Random Matrix

Input:
R = rand(2,2)
Output:
R =
   0.8147   0.9134
   0.9058   0.6324

Random Integers

Input:
A = randi([1,10],2,3)
Output:
A =
   3   9   2
   6   1   7

Diagonal Matrix

Input:
D = diag([1 2 3])
Output:
D =
```
   1   0   0
   0   2   0
   0   0   3
```

Access Element

Input:
A = [1 2 3; 4 5 6]; A(2,3)
Output:
ans =
```
   6
```

Row Access

Input:
A(1,:)
Output:
ans =
```
   1   2   3
```

Column Access

Input:
A(:,2)
Output:
ans =
```
   2
   5
```

Submatrix

Input:
A(1:2,2:3)
Output:
ans =
```
   2   3
   5   6
```

Last Row

Input:
A(end,:)
Output:
ans =
```
   4   5   6
```

Addition

Input:
A = [1 2; 3 4]; B = [5 6; 7 8]; A+B
Output:
ans =
```
   6   8
  10  12
```

Subtraction

Input:
A - B
Output:
ans =
   -4   -4
   -4   -4

Matrix Multiplication

Input:
A = [1 2; 3 4]; B = [2 0; 1 2]; A*B
Output:
ans =
    4   4
   10   8

Element-wise Multiplication

Input:
A.*B
Output:
ans =
    2   0
    3   8

Element-wise Power

Input:
A.^2
Output:
ans =
    1   4
    9   16

Transpose

Input:
A'
Output:
ans =
    1   3
    2   4

Inverse

Input:
inv([1 2; 3 4])
Output:
ans =
   -2.0000   1.0000
    1.5000   -0.5000

Pseudo-Inverse

Input:
pinv([1 2; 3 4])
Output:
ans =

```
  -2.0000   1.0000
   1.5000  -0.5000
```

Determinant

Input:
det([1 2; 3 4])
Output:
ans =
  -2

Rank

Input:
rank([1 2; 2 4])
Output:
ans =
   1

Reshape

Input:
reshape([1 2 3 4 5 6],3,2)
Output:
ans =
   1   4
   2   5
   3   6

Flip Left-Right

Input:
fliplr([1 2 3; 4 5 6])
Output:
ans =
   3   2   1
   6   5   4

Flip Up-Down

Input:
flipud([1 2 3; 4 5 6])
Output:
ans =
   4   5   6
   1   2   3

Rotate 90°

Input:
rot90([1 2; 3 4])
Output:
ans =
   2   4
   1   3

Repeat Matrix

Input:
repmat([1 2],2,3)

Output:
```
ans =
    1    2    1    2    1    2
    1    2    1    2    1    2
```

Sort Columns

Input:
```
sort([3 1; 2 4])
```
Output:
```
ans =
    2    1
    3    4
```

Horizontal Concatenation

Input:
```
[[1 2];[3 4]], [[5 6];[7 8]]
```
Output:
```
ans =
    1    2    5    6
    3    4    7    8
```

Vertical Concatenation

Input:
```
[[1 2];[3 4]]; [[5 6];[7 8]]
```
Output:
```
ans =
    1    2
    3    4
    5    6
    7    8
```

Matrix Size

Input:
```
size([1 2; 3 4])
```
Output:
```
ans =
    2    2
```

Length

Input:
```
length([1 2; 3 4])
```
Output:
```
ans =
    2
```

Number of Elements

Input:
```
numel([1 2; 3 4])
```
Output:
```
ans =
    4
```

Is Empty?

Input:
isempty([])
Output:
ans =
    1

Is Vector?

Input:
isvector([1 2 3])
Output:
ans =
    1

Is Matrix?

Input:
ismatrix([1 2; 3 4])
Output:
ans =
    1

Sum

Input:
sum([1 2; 3 4])
Output:
ans =
    4   6

Mean

Input:
mean([1 2; 3 4])
Output:
ans =
    2   3

Find Elements

Input:
find([0 5 0; 3 0 6])
Output:
ans =
    2
    4
    6

Max of Column

Input:
max([1 5; 3 2])
Output:
ans =
    3   5

Min of Column

Input:
min([1 5; 3 2])

Output:
ans =
     1   2