

Matrices

- Matrix is a two-dimensional array . In MATLAB, a matrix is created by entering each row as a sequence of space or comma separated elements, and end of a row is demarcated by a **semicolon** inside square brackets []
- Matrices can be used to store information like the arrangement in a table

For example, create a 3-by-3 matrix (square matrix the number of rows and the number of columns is equal.)

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

- `>> k =`

1	2	3
4	5	6
7	8	9



`m * n`
`3 * 3 matrix`

A **m x n** matrix has **m** rows and **n** columns, and m by n is called the **size of the matrix**, to reference an element in the mth row and nth column, of a matrix k, we write:

`K=(m, n)`

- `[m, n]=size(k) >> m= 3 , n= 3 → matrix size(k) (rows, columns)`

- Creating matrices by mathematical expressions

`cd=6; e=3; h=4;`

`>> M=[e, cd*h, cos(pi/3); h^2, sqrt(h*h/cd), 14]`

`M=` 3.0000 24.0000 0.5000
 16.0000 1.6330 14.0000

- Rows of a matrix can also be entered as vectors using the notation for creating vectors

For example:

```
a =[12345;23456;34567;45678];    >> a =
```

1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8

```
>> v=a( [1:3], : )
```

```
    v = 1  2  3  4  5
```

```
        2  3  4  5  6
```

```
        3  4  5  6  7
```

- Create a column vector **z**, from the elements of the 4th row of the matrix **a** :

```
z = a(4,:)    >> z =
```

```
    4
```

```
    5
```

```
    6
```

```
    7
```

```
    8
```

- create a sub-matrix taking a sub-part of a matrix.

```
sa = a(2:3,2:4)
```

```
>> sa =
```

```
    3  4  5
```

```
    4  5  6
```