

Matlab Cheat Sheet

Arrays/lists of numbers

`x=[1 2 3]` x is an array with 3 entries: 1, 2, and 3.
`x=1:10:4` The entry of x runs from 1 to 10, increased by 4 each time.
`x=1:10` The entry of x runs from 1 to 10, increased by 1 each time.
`x=linspace(1,10,19)` There are 19 equally spaced values in x running from 1 to 10.
`x=zeros(1,10)` x is a 1*10 matrix, with all entries being zero.
`x=ones(1,10)` x is a 1*10 matrix, with all entries being one.

Random number

`x=randi(10)` x is a random integer between 1 and 10.
`x=rand` x is a random number between 0 and 1.

Arithmetic

We assume x is an array in the following examples.

`x=x+2` Every entry of x is added by 2.
`x=x-2` Every entry of x is subtracted by 2.
`x=x.*2` Every entry of x is multiplied by 2.
`x=x./2` Every entry of x is divided by 2.
`x=x.^2` Every entry of x is squared.
`x(2)=10` The second entry of x is changed to 10.

Summation

We assume x is an array in the following examples.

`y=sum(x)` y is a number, the summation of every entry of x.
`y=cumsum(x)` y is an array (with the same size as x), each entry of which is the partial sum of entries of x.

For example,

```
x=[1 2 3]
y=sum(x)
z=cumsum(x)
```

gives $y=6$ and $z=[1\ 3\ 6]$.

Plot

We assume x and y are arrays in the following examples.

`plot(x,y,'ro')` Plot the points (x_i, y_i) with red circles, where x_i runs through the entries of x, and y_i runs through the entries of y.

Plot setting

In the code `plot(x,y,'ro')`, r is the color specifier, while o is the marker specifier.

Color specifier		Marker specifier	
r	Red	+	Plus sign
g	Green	o	Circle
b	Blue	.	Point
y	Yellow	x	Cross
k	Black	s	Square

Hold on

`hold on` Hold the current graph, and put subsequent plots on the same set of axes.
`hold off` Do not hold on.

For

The standard structure of for loop is

```
for i=1:10
    ...(some commands)...
end
```

In this code, i is running from 1 to 10, increased by 1 each time. The commands would be executed ten times, corresponding to $i=1, 2, \dots, 10$.

For example,

```
x=0
for i=1:10
    x=x+i;
end
x
```

gives $x=1+2+\dots+10=55$.

Another example is a nested structure.

```
x=0
for i=1:10
    for j=1:3
        x=x+(i+j);
    end
end
x
```

gives $x=(2+3+4)+(3+4+5)+(4+5+6)+\dots+(11+12+13)=225$.

If

The structure of if is

```
if a>b
    ...(some commands)...
end
```

In this code, the condition is $a>b$. Only when the condition is satisfied ($a>b$) will the commands be executed.

For instance,

```
x=0
for i=1:10
    if i>5
        x=x+i;
    end
end
x
```

gives $x=6+7+8+9+10=40$.