MATLAB - COLON NOTATION

The **colon:** is one of the most useful operator in MATLAB. It is used to create vectors, subscript arrays, and **specify for iterations**.

If you want to create a row vector, containing integers from 1 to 10, you write −

```
1:10
```

MATLAB executes the statement and returns a row vector containing the integers from 1 to 10 −

```
ans =

    1    2    3    4    5    6    7    8    9   10
```

If you want to specify an increment value other than one, for example −

```
100: -5: 50
```

MATLAB executes the statement and returns the following result −

```
ans =
   100    95    90    85    80    75    70    65    60    55    50
```

Let us take another example −

```
0:pi/8:pi
```

MATLAB executes the statement and returns the following result −

```
ans =
  Columns 1 through 7
      0    0.3927    0.7854    1.1781    1.5708    1.9635    2.3562
  Columns 8 through 9
    2.7489    3.1416
```

You can use the colon operator to create a vector of indices to select rows, columns or elements of arrays.

The following table describes its use for this purpose *letushaveamatrixA* −

Format	Purpose
A:, *j*	is the jth column of A.
A*i*, :	is the ith row of A.
A:, :	is the equivalent two-dimensional array. For matrices this is the same as A.
A*j*:*k*	is Aj, A$j+1$,...,Ak.
A:, *j*:*k*	is A:, j, A:, $j+1$,...,A:, k.
A:, :, *k*	is the kth page of three-dimensional array A.
A*i*, *j*, *k*, :	is a vector in four-dimensional array A. The vector includes A$i, j, k, 1$, A$i, j, k, 2$, A

	$i, j, k, 3$, and so on.
A:	is all the elements of A, regarded as a single column. On the left side of an assignment statement, A: fills A, preserving its shape from before. In this case, the right side must contain the same number of elements as A.

Example

Create a script file and type the following code in it −

```
A = [1 2 3 4; 4 5 6 7; 7 8 9 10]
A(:,2)       % second column of A
A(:,2:3)     % second and third column of A
A(2:3,2:3)   % second and third rows and second and third columns
```

When you run the file, it displays the following result −

```
A =
     1     2     3     4
     4     5     6     7
     7     8     9    10

ans =
     2
     5
     8

ans =
     2     3
     5     6
     8     9

ans =
     5     6
     8     9
```