MATLAB - VECTORS

A vector is a one-dimensional array of numbers. MATLAB allows creating two types of vectors −

- Row vectors
- Column vectors

Row Vectors

Row vectors are created by enclosing the set of elements in square brackets, using space or comma to delimit the elements.

```
r = [7 8 9 10 11]
```

MATLAB will execute the above statement and return the following result −

```
r =

    7    8    9    10    11
```

Column Vectors

Column vectors are created by enclosing the set of elements in square brackets, using semicolon to delimit the elements.

```
c = [7;  8;  9;  10; 11]
```

MATLAB will execute the above statement and return the following result −

```
c =
        7
        8
        9
       10
       11
```

Referencing the Elements of a Vector

You can reference one or more of the elements of a vector in several ways. The ith component of a vector v is referred as v_i. For example −

```
v = [ 1; 2; 3; 4; 5; 6]; % creating a column vector of 6 elements
v(3)
```

MATLAB will execute the above statement and return the following result −

```
ans =  3
```

When you reference a vector with a colon, such as v:, all the components of the vector are listed.

```
v = [ 1; 2; 3; 4; 5; 6]; % creating a column vector of 6 elements
v(:)
```

MATLAB will execute the above statement and return the following result —

```
ans =
       1
       2
       3
       4
       5
       6
```

MATLAB allows you to select a range of elements from a vector.

For example, let us create a row vector *rv* of 9 elements, then we will reference the elements 3 to 7 by writing **rv3: 7** and create a new vector named *sub_rv*.

```
rv = [1 2 3 4 5 6 7 8 9];
sub_rv = rv(3:7)
```

MATLAB will execute the above statement and return the following result —

```
sub_rv =

   3    4    5    6    7
```

Vector Operations

In this section, let us discuss the following vector operations —

- [Addition and Subtraction of Vectors](#)
- [Scalar Multiplication of Vectors](#)
- [Transpose of a Vector](#)
- [Appending Vectors](#)
- [Magnitude of a Vector](#)
- [Vector Dot Product](#)
- Vectors with Uniformly Spaced Elements

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