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MAT LAB

Vector and matrix indexing:

Indexing into a matrix is a means of selecting a subset of elements from the matrix. MATLAB

```
c=[1; 2; 3]
```

```
c =
```

```
1  
2  
3
```

```
c=[1 2 3;4 5 6;7 8 9;10 11 12]
```

```
c =
```

```
1     2     3  
4     5     6  
7     8     9  
10    11    12
```

```
c(3,2)
```

```
ans =
```

```
8
```

```
c(:,3)
```

```
ans =
```

```
3  
6  
9  
12
```

```
c(:,1)
```

```
ans =
```

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```
1
4
7
10
c(:,2)

ans =

2
5
8
11
c(2:3,2:3)

ans =

5    6
8    9
```

Indexing Vectors:

The vector is:

```
v = [16 5 9 4 2 11 7 14];
```

subscript can be a single value:

```
>>v(3)    % Extract the third element
```

```
ans =
```

```
9
```

subscript can itself be another vector:

```
>>v([1 5 6])    % Extract the first, fifth, and sixth elements
```

```
ans =
```

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16 2 11

The colon notation in MATLAB provides an easy way to extract a range of elements from v:

```
>>v(3:7)        % Extract the third through the seventh elements
```

ans =

9 4 2 11 7

Swap the two halves of v to make a new vector:

```
>>v2 = v([5:8 1:4])        % Extract and swap the halves of v
```

v2 =

2 11 7 14 16 5 9 4

```
>> v(end) % Extract the last element
```

ans =

14

```
>> v(5:end) % Extract the fifth through the last elements
```

ans =

2 11 7 14

```
>>v(2:end-1) % Extract the second through the next-to-last elements
```

ans =

5 9 4 2 11 7

```
>>v
```

v =

16 5 9 4 2 11 7 14

```
>>v(1:2:end) % Extract all the odd elements
```

ans =

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```
16    9    2    7

>>v(end:-1:1) % Reverse the order of elements

ans =

14    7    11    2    4    9    5    16

>>v([2 3 4]) = [10 15 20] % Replace some elements of v

v =

16    10    15    20    2    11    7    14

>>v([2 3]) = 30 % Replace second and third elements by 30

v =

16    30    30    20    2    11    7    14

>>v

v =

16    30    30    20    2    11    7    14
```

Indexing Matrices with Two Subscripts:

%Indexing Matrices with Two Subscripts

```
>>A=magic(4)
```

```
A =
```

```
16    2    3    13
 5   11   10    8
 9    7    6   12
 4   14   15    1
```

```
>>A(2,4) % Extract the element in row 2, column 4
```

```
ans =
```

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```
>>A(2:4,1:2) % Extract the element in row 2 to 4 and column 1 to 2
```

ans =

```
5    11
9     7
4    14
```

```
>>A(3,:) % Extract third row
```

ans =

```
9     7     6    12
```

```
>>A(:,end) % Extract last column
```

ans =

```
13
8
12
1
```

```
>>A(:,end-1) % Extract second last column
```

ans =

```
3
10
6
15
```