

	ME 444 MATLAB FOR ENGINEERS
	Practice 02- Vector and Matrix Operations

1. Construct the following row vectors using the colon operator (:).

3	4	5	6
1.3000	1.7000	2.1000	2.5000
9	7	5	3

2. Use the **linspace** command to define the vector defined by the expression 1:0.5:3.
3. Using the colon operator as well as the **linspace** command, create the following line vectors:

-4	-3	-2	-1	0
9	7	5		
4	6	8		

4. Create a variable named *myend*, which is a random integer between 5 and 9. Then, using the colon operator, define a vector from 1 to *myend* with 3 steps between its elements.
5. Create two row vectors, then combine these two vectors to create a new vector.
6. Using the colon and transpose operators, create a column vector named *myvec* with values -1 to 1 in increments of 0.5.
7. Create a 2 x 4 matrix named *mat*. Then replace the first line with 1:4. Finally replace the third column with the numbers you want.
8. Construct a 2 x 3 dimensional matrix of random elements according to the following rules:
- Its elements are in the range (0, 1) and consist of real numbers,
 - Its elements are in the range (0, 5) and consist of real numbers,
 - Elements in the range (10, 50) and consisting of integers.
9. Construct a matrix of 3 x 5 random real numbers. Then delete the 3rd row of the matrix
10. Perform the 2+4+6+8+10 operation using the **sum** function and colon operators.
11. Find the following sum by first constructing vectors for the numerators and denominators:

$$\frac{3}{4} + \frac{5}{2} + \frac{7}{3} + \frac{9}{4}$$

Problem 01. A company that calibrates some measuring devices measures the radius and height of a cylinder at 8 different times; then they store these values in vector variables *r* and *h*. Calculate the volume

of the cylinder using the values from each measurement and the equation $V = \pi r^2 h$. Also, use logical indexing (all, any ... etc) first to ensure that all measurements are valid (i.e. greater than zero > 0). (You can give r and h values as you want)

Problem 02. Construct a vector of 20 random integers, each ranging from 50 to 100. Create a variable named even, which stores all even numbers in the vector, and a variable named odd, which stores odd numbers.

***iPUCU:** Even numbers are numbers that are exactly divisible by 2. In MATLAB, there is a rem (divisor, divisor) function that finds the remainder after dividing a number by another number.

Sample:

```
>> A=[1 2 12 6 8 3];  
>> rem(A,2)  
ans =  
     1     0     0     0     0     1
```

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Practice 02-Matrix Operations

1.

```
Command Window

>> 3:8

ans =

     3     4     5     6     7     8

>> 1.3:0.4:2.5

ans =

    1.3000    1.7000    2.1000    2.5000

>> 9:-2:3

ans =

     9     7     5     3
```

2.

```
Command Window

>> A=1:0.5:3
A =
    1.0000    1.5000    2.0000    2.5000    3.0000
>> A=linspace(1,3,5)
A =
    1.0000    1.5000    2.0000    2.5000    3.0000
```

3.

```
>> -4:0
ans =
    -4    -3    -2    -1     0
>> linspace(-4,0,5)
ans =
    -4    -3    -2    -1     0
>> 9:-2:5
ans =
     9     7     5
>> linspace(9,5,3)
ans =
     9     7     5
>> 4:2:8
ans =
     4     6     8
>> linspace(4,8,3)
ans =
     4     6     8
```

4.

```
>> myend=randi([5,9])
myend =
     9
>> vec=1:3:myend
vec =
     1     4     7
```

5.

```
>> a=2:4
a =
     2     3     4
>> b=5:2:10
b =
     5     7     9
>> yeni=[a b]
yeni =
     2     3     4     5     7     9
```

6.

```
>> rowvector=-1:0.5:1
rowvector =
    -1.0000    -0.5000         0     0.5000     1.0000
>> columnvec=rowvector'
columnvec =
    -1.0000
    -0.5000
         0
     0.5000
     1.0000
```

7.

```
>> mat=[8 9 10 11; 5 7 2 8]
mat =
     8     9    10    11
     5     7     2     8
>> mat(1,:)=1:4
mat =
     1     2     3     4
     5     7     2     8
>> mat(:,3)=[1 1]
mat =
     1     2     1     4
     5     7     1     8
```

8.

```
>> rand(2,3)
ans =
    0.9058    0.9134    0.0975
    0.1270    0.6324    0.2785
>> rand(2,3)*5
ans =
    2.7344    4.8244    4.8530
    4.7875    0.7881    4.7858
>> randi([10,50],2,3)
ans =
    29    15    47
    42    27    42
```

9.

```
>> A=rand(3,5)
A =
    0.9595    0.8491    0.7577    0.6555    0.0318
    0.6557    0.9340    0.7431    0.1712    0.2769
    0.0357    0.6787    0.3922    0.7060    0.0462
>> A(3,:)=[]
A =
    0.9595    0.8491    0.7577    0.6555    0.0318
    0.6557    0.9340    0.7431    0.1712    0.2769
```

10.

```
>> sum(2:2:10)
ans =
    30
```

11.

```
>> pay=3:2:9
pay =
     3     5     7     9
>> payda=1:4
payda =
     1     2     3     4
>> bolumsonucu=pay./payda
bolumsonucu =
     3.0000     2.5000     2.3333     2.2500
>> sum(bolumsonucu)
ans =
    10.0833
```

Problem 01.

```
>> r = [5.499 5.498 5.5 5.5 5.52 5.51 5.5 5.48];  
>> h = [11.1 11.12 11.09 11.11 11.11 11.1 11.08 11.11];  
>> all(r>0 & h>0)  
  
ans =  
  
     1  
  
>> vol = pi * r.^2 .* h
```

Problem 02.

```
>> sayi=randi([50,100],1,20);  
>> cift=sayi(mod(sayi,2)==0);  
>> tek=sayi(mod(sayi,2)~=0);  
>> cift  
cift =  
     62     84     84     50     80     96     50  
>> tek  
tek =  
     61     93     67     89     69     73     71
```