

ME 444 MATLAB FOR ENGINEERS

Practice 01

1. Design an algorithm and flow diagram that shows two different numbers and the largest one.
2. Make the algorithm and flow diagram that prints odd numbers from 1 to 100.
3. Create the algorithm for the program that gives the sum and average of the five numbers.
4. Create the flowchart of the program that takes the factorial of the number entered from the keyboard.
5. Create the algorithm and flowchart of the program, which calculates the area of the right triangle entered from the keyboard in height and base length.
6. Create the program algorithm and flow diagram that calculates the third edge of the triangle, where the length of the two sides and the angle in degrees between these two sides are entered by keyboard.
7. Calculate the following mathematical operations for the values $x = 10$ and $y = 3$ using the MATLAB program. Check your answers using your calculator.

a. $u = x + y$

b. $v = xy$

c. $w = \frac{x}{y}$

d. $z = \sin x$

e. $r = 8 \sin y$

f. $s = 5 \sin(2y)$

8. $x = 2$ ve $y = 5$ değerleri için aşağıdaki denklemleri MATLAB 'ta hesaplayınız.

a. $\frac{yx^3}{x-y}$

b. $\frac{3x}{2y}$

c. $\frac{3}{2}xy$

d. $\frac{x^5}{x^5-1}$

9. Calculate the following equations in MATLAB for the values $x = 3$ and $y = 4$. Check your results in the calculator.

a. $\left(1 - \frac{1}{x^5}\right)^{-1}$

b. $3\pi x^2$

c. $\frac{3y}{4x-8}$

d. $\frac{4(y-5)}{3x-6}$

10. Calculate the following mathematical operations for the given values using the MATLAB program.

a. $y = 6x^3 + \frac{4}{x}, \quad x = 3$

b. $y = \frac{x}{4} 3, \quad x = 7$

c. $y = \frac{(4x)^2}{25}, \quad x = 9$

d. $y = 2 \frac{\sin x}{5}, \quad x = 4$

e. $y = 7(x^{1/3}) + 4x^{0.58}, \quad x = 30$

11. Write MATLAB expressions to calculate and print the following operations, with a, b, c, d and f being scalar variables. To verify MATLAB expressions, use a=1.12, b=2.34, c= 0.72, d=0.81, and f=19.83.

$$x = 1 + \frac{a}{b} + \frac{c}{f^2} \quad s = \frac{b - a}{d - c}$$

$$r = \frac{1}{\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}} \quad y = ab \frac{1}{c} \frac{f^2}{2}$$

12. Calculate the following mathematical operations using the MATLAB program.

$$a. \frac{3}{4} (6) (7^2) + \frac{4^5}{7^3 - 145} \quad b. \frac{48.2(55) - 9^3}{53 + 14^2}$$

$$c. \frac{27^2}{4} + \frac{319^{4/5}}{5} + 60(14)^{-3}$$

*Check the results with your calculators.

13. For the values $x = 5 + 8i$, and $y = -6 + 7i$, calculate the following equations.

$$a. u = x + y \quad b. v = xy \quad c. w = x/y$$

$$d. z = e^x \quad e. r = \sqrt{y} \quad f. s = xy^2$$

14. Find the initial speed required for a 1 kg gun to reach a height of 20 m by throwing it vertically up?

15. Calculate the following mathematical expressions.

$$a. 6\pi \tan^{-1}(12.5) + 4 \quad b. 5 \tan [3 \sin^{-1}(13/5)]$$

$$c. 5 \ln(7) \quad d. 5 \log(7)$$

16. Using MATLAB, find out how many elements are in the expression $\sin(-\pi/2) : 0.05 : \cos(0)$ and the 10th element of this sequence.

17. Create the following line vectors using the colon operator (column operator).

3	4	5	6	7	8
1.3000	1.7000	2.1000	2.5000		
9	7	5	3		

18. Use the **linspace** command to define the vector defined by the expression $1 : 0.5 : 3$.

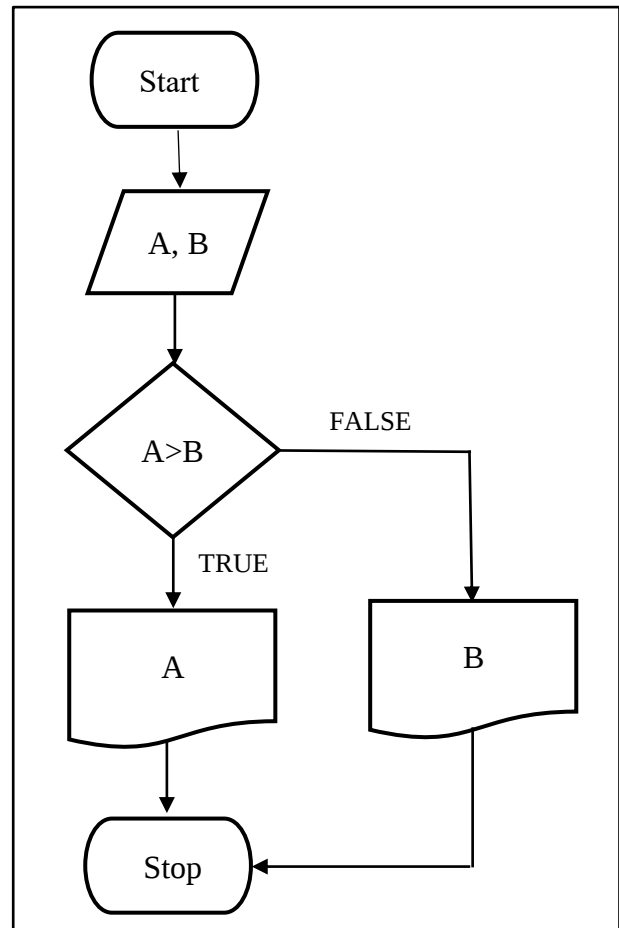
19. Create a program that asks the user to enter the midterm and final grades from the keyboard and calculates the grade point average and prints it on the screen. (NOTE: The midterm grade constitutes 40% of the final grade and the final grade constitutes 60% of the final grade.)

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Practice 01

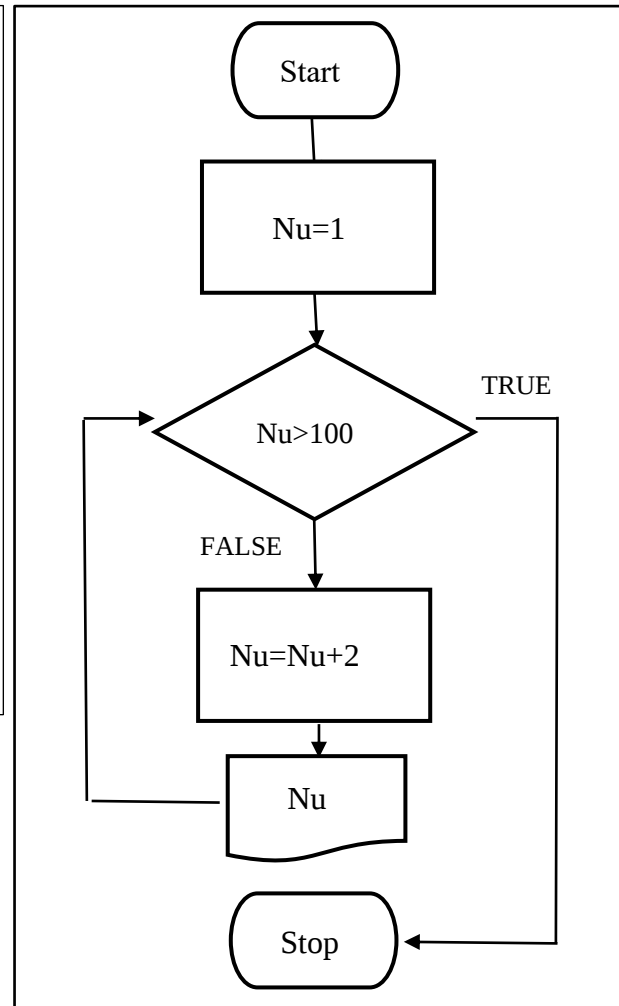
1.

1. Start
2. Enter a number (A)
3. Enter a number (B)
4. If $A > B$, write A
5. else, write B
6. Stop



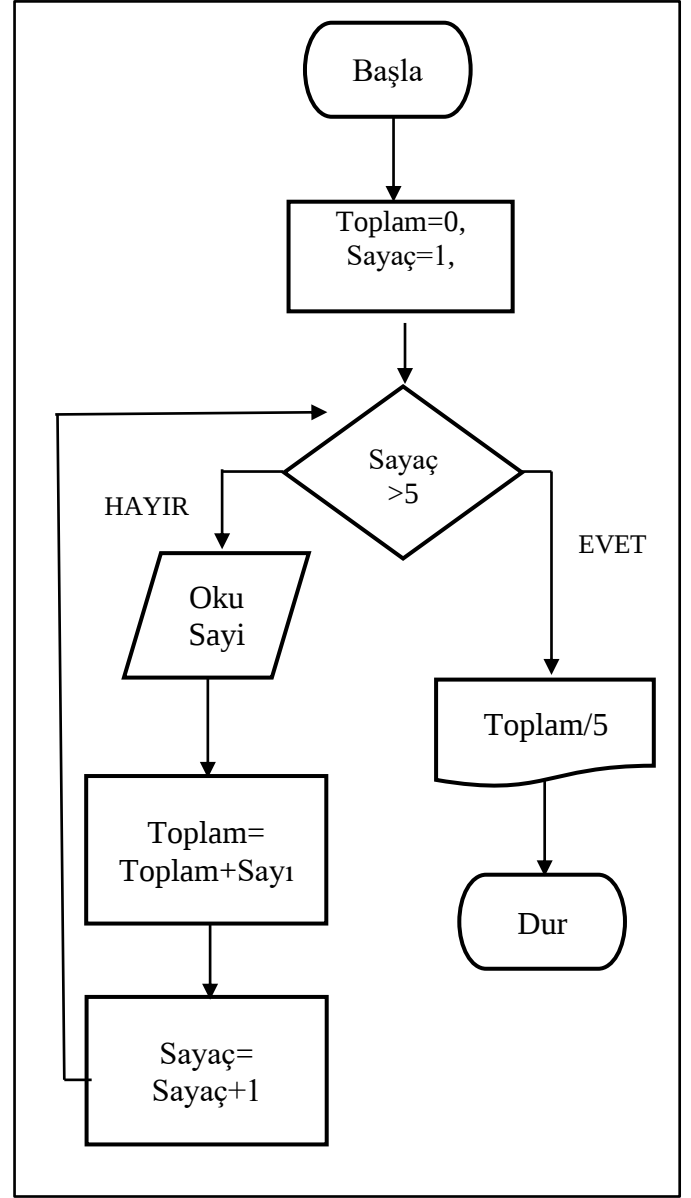
2.

1. Start
2. Assign 1 to the variable **Nu**
3. If **Nu > 100**, GO TO Step 6
4. Else, increase **Nu** by 2, and assign to Nu again ($Nu = Nu + 2$)
5. Prompt **Nu** , GO TO 3
6. Stop



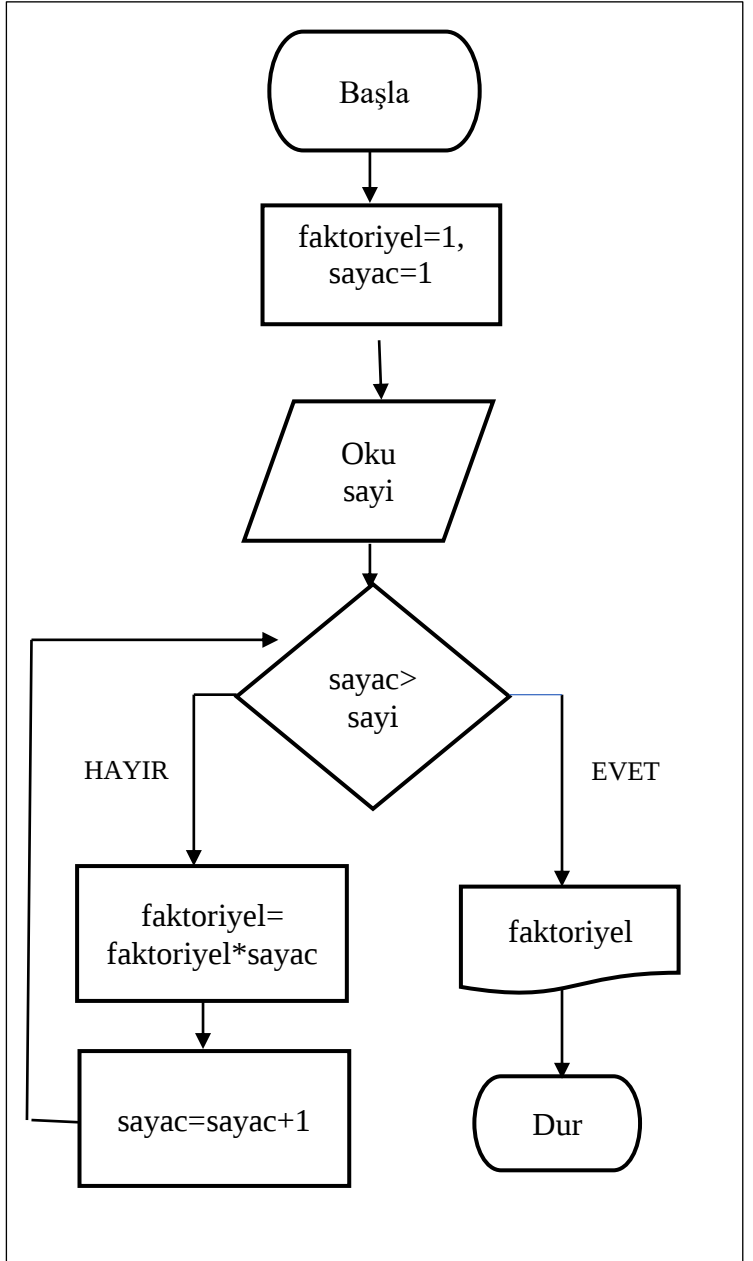
3.

1. Start
2. Assign the value 0 to the sum variable
4. Eğer Sayac>5 ise 8. adıma git
5. Sayı gir
6. Toplam değişkenine Sayı değişkenini ekle, tekrar Toplam değişkenine ata
(Toplam=Toplam+Sayı)
7. Sayac değerini 1 artır ve 4. adıma git (Sayac=Sayac+1)
8. Toplam değişkenini 5'e böl ekrana yaz
9. Dur



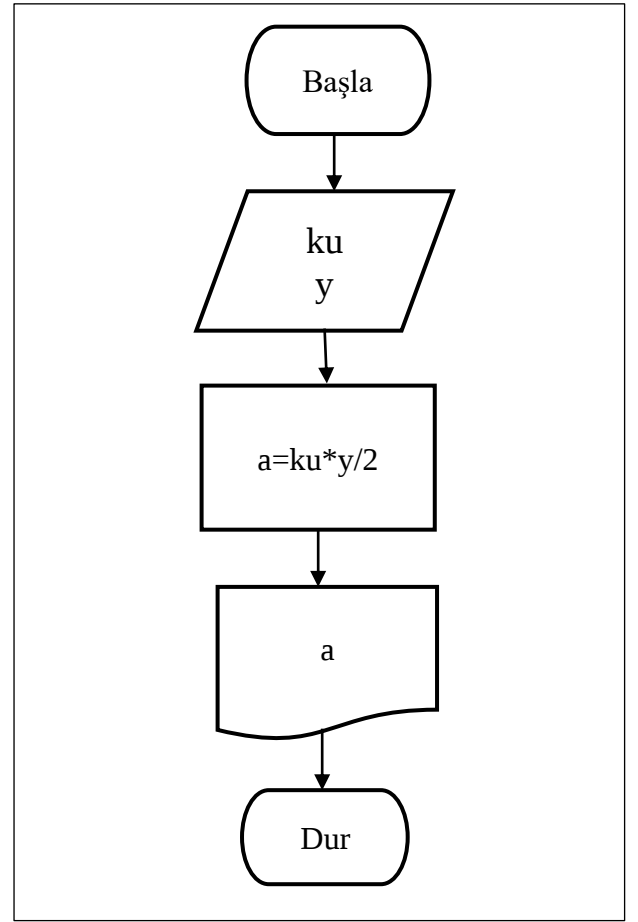
4.

1. Başla
2. faktoriyel isimli değişkeni tanımla ve 1 değerini ata
3. sayac isimli değişkeni tanımla ve 1 değerini ata
4. sayı gir
5. Eğer $\text{sayac} > \text{sayi}$ ise 8. adıma git
6. faktoriyel 'i sayac ile çarp ve tekrar faktoriyel 'e ata
($\text{faktoriyel} = \text{faktoriyel} * \text{sayac}$)
7. sayac değerini 1 artır ve tekrar sayac 'a ata, 5. adıma git
($\text{sayac} = \text{sayac} + 1$)
8. faktoriyel değerini ekrana yaz
9. Dur



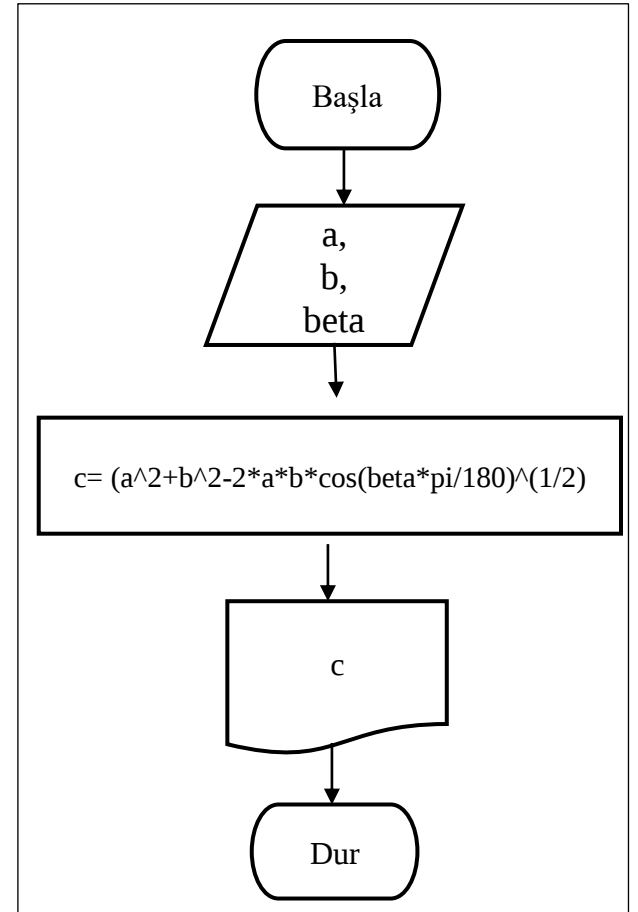
5.

1. Başla
2. Kenar uzunluğunu (ku) gir
3. Yüksekliği (y) gir
4. Kenar uzunluğu ile yüksekliği çarpıp 2'ye böl ve sonucu alan (a) değişkenine ata ($a = ku * y / 2$)
5. Alan değişkenini ekrana yaz
6. Dur



6.

1. Başla
2. Kenar uzunluğunu (a) gir
3. Kenar uzunluğunu (b) gir
4. Açıyı (beta) gir
5. $c = (a^2 + b^2 - 2 * a * b * \cos(\beta * \pi / 180))^{1/2}$
5. c'yi ekrana yaz
6. Dur



7.

```
Command Window

>> x=10;
>> y=3;
>> u=x+y

u =

    13

>> v=x*y

v =

    30

>> w=x/y

w =

    3.3333
```

```
Command Window

>> x=10;y=3;
>> z=sin(x)

z =

   -0.5440

>> r=8*sin(y)

r =

    1.1290

>> s=5*sin(2*y)

s =

   -1.3971
```

8.

```
Command Window

>> x=2;y=5;
>> y*x^3/(x-y)

ans =

   -13.3333

>> 3*x/(2*y)

ans =

    0.6000

>> 3*x*y/2

ans =

    15

>> x^5/(x^5-1)

ans =

    1.0323
```

9.

```
Command Window

>> x=3;
>> y=6*x^3+4/x

y =

    163.3333

>> x=7;
>> y=x/4*3

y =

     5.2500

>> x=9;
>> y=(4*x)^2/25

y =

    51.8400
```

```
Command Window

>> x=4;
>> y=2*sin(x)/5

y =

    -0.3027

>> x=30;
>> y=7*x^(1/3)+4*x^(0.58)

y =

    50.5107
```

10.

```
Command Window

>> x=3;
>> y=4;
>> a=(1-1/x^5)^-1

a =

    1.0041

>> b=3*pi*x^2

b =

    84.8230

>> 3*y/(4*x-8)

ans =

     3

>> d=4*(y-5)/(3*x-6)

d =

    -1.3333
```

11.

```
Command Window

>> a=1.12;
>> b=2.34;
>> c=0.72;
>> d=0.1;
>> f=19.83;
>> x=1+a/b+c/f^2

x =

    1.4805
```

```
Command Window

>> s=(b-a)/(d-c)

s =

    13.5556

>> r=1/(1/a+1/b+1/c+1/d)

r =

    0.2536

>> y=a*b/c/2*f^2

y =

    715.6766
```

12.

```
Command Window

>> a=3/4*6*7^2+4^5/(7^3-145)

a =

    225.6717

>> b=(48.2*55-9^3)/(53+14^2)

b =

    7.7189

>> c=27^2/4+319^(4/5)/5+60*14^-3

c =

    202.4120
```

13.

Command Window	Command Window
<pre>>> x=5+8i; >> y=-6+7i; >> u=x+y u = -1.0000 +15.0000i >> v=x*y v = -86.0000 -13.0000i >> w=x/y w = 0.3059 - 0.9765i</pre>	<pre>>> z=exp(x) z = -2.1594e+01 + 1.4683e+02i >> r=sqrt(y) r = 1.2688 + 2.7586i >> s=x*y^2 s = 6.0700e+02 - 5.2400e+02i</pre>

14.

```
Command Window

>> a=[13 182 -184 2503];
>> roots(a)

ans =

   -15.6850 + 0.0000i
    0.8425 + 3.4008i
    0.8425 - 3.4008i
```

15.

```
Command Window

>> g=9.81; %yer çekimi ivmesi
>> h=20; % m - yükseklik
>> v0=sqrt(2*g*h) %v^2=2gh

v0 =

    19.8091
```

16.

```
Command Window

>> a=6*pi*atan(12.5)+4

a =

    32.1041

>> b=5*tan(3*asin(13/5))

b =

    0.0000 - 5.0006i

>> c=5*log(7)

c =

    9.7296

>> d=5*log10(7)

d =

    4.2255
```

17.

```
Command Window
>> A=sin(-pi/2):0.05:cos(0);
>> size(A)

ans =

     1     41

>> A(10)

ans =

    -0.5500
```

```
Command Window
>> A=sin(-pi/2):0.05:cos(0);
>> numel(A)

ans =

     41

>> A(10)

ans =

    -0.5500
```

18. $x = 1, 1.2, 1.4, \dots, 5$ arasındaki değerler için, $y = 7\sin(4x)$ fonksiyonunun sonuçlarından oluşan y dizisini oluşturunuz ve dizinin 3. elemanını belirleyiniz.

```
Command Window
>> x=1:0.2:5;
>> y=7*sin(4*x);
>> numel(y)

ans =

     21

>> y(3)

ans =

    -4.4189
```