

## Class Assignment\_8

### Chapter7 (1-5)

1. Evaluate the following expressions without using MATLAB. Check the answer with MATLAB.
- a)  $5 \leq 8 - 3$
  - b)  $y = 7 < 3 - 1 + 6 > 2$
  - c)  $y = (7 < 3) - 1 + (6 > 2)$
  - d)  $y = 2 \times 4 + 5 = 7 + \frac{20}{4}$
2. Given:  $a = 10$ ,  $b = 6$ . Evaluate the following expressions without using MATLAB. Check the answer with MATLAB.
- a)  $y = a > b$
  - b)  $y = a - b < \frac{b}{2}$
  - c)  $y = a - (b < \frac{b}{2})$
3. Given:  $v = [4 \ -2 \ -1 \ 5 \ 0 \ 1 \ -3 \ 8 \ 2]$  and  $w = [0 \ 2 \ 1 \ -1 \ 0 \ -2 \ 4 \ 3 \ 2]$ . Evaluate the following expressions without using MATLAB. Check the answer with MATLAB.
- a)  $v > w$
  - b)  $w \sim v$
4. Use the vectors  $v$  and  $w$  from the previous problem. Use relational operators to create a vector  $y$  that is made up from the elements of  $w$  that are greater than the elements of  $v$ .
5. Evaluate the following expressions without using MATLAB. Check the answer with MATLAB.
- a)  $5 \& -2$
  - b)  $8 - 2 | 6 + 5 \& \sim 2$
  - c)  $\sim(4 \& 0) + 8 * \sim(4 | 0)$

Moshe Brand (HW>24,25)

6. Write a script that compares corresponding elements in two matrices. The script will build a 3X3 matrix that contains the greater element (of A from B) in each location. If the corresponding elements are equal, the value in the output matrix will be zero. Run your script to build the combined matrix for the following two matrices:

$$\begin{array}{cc} A = \begin{bmatrix} 2 & 1 & 7 \\ 9 & 2 & 6 \\ 1 & 4 & 8 \end{bmatrix} & B = \begin{bmatrix} 7 & 4 & 2 \\ 5 & 2 & 8 \\ 3 & 1 & 9 \end{bmatrix} \end{array}$$

7. כתוב/י פונקציה (בשם change) המקבלת קלט של מערך מספרים. הפונקציה מחזירה פלט של מערך הקלט שבו כל האיברים עם הערך המינימאלי מוחלפים עם האיברים של הערך המכסימאלי.

לאחר מכן כתוב תוכנית שבה מוגדר מערך D בממד של 6 שורות ו- 6 עמודות. המערך יכול מספרים אקראיים שלמים בערכים שבין 0 ל- 10.

קרא לפונקציה שכתבת והחלף את כל האיברים של המערך D בעלי הערך המינימאלי – בערך המכסימאלי של המערך.

8. Create a user-defined function named "egool" that rounds numbers according to an input that defines the number of digits. The function receives two inputs: The first input is an array of random fractions (scalar, vector or a matrix), and the second input determines the number of the rounded digits.

For example:

For an array of the following random numbers (that are represented in format long):

numbers =

```
9.50129285147175 6.06842583541787  
2.31138513574288 4.85982468709300
```

Typing the line:

```
d=egool(numbers,3)
```

Will return:

```
d =  
9.501000000000000 6.068000000000000  
2.311000000000000 4.860000000000000
```

And typing:

```
d=egool(numbers,6)
```

will return:

```
d =  
9.501293000000000 6.068426000000000  
2.311385000000000 4.859825000000000
```

9. Write a user-defined function named 'merucav' that calculates the radius and the angle of a complex number in Cartesian coordinates. The Input of the function will be sole input of the complex number in the Cartesian coordinates system. The function will have two outputs: radius and angle accordingly in a polar coordinates system.

Note: you must not use the built-in function: cart2pol

For example:

For the complex number:  $c=5i+3$

The command: `[Radius,Zavit]=merucav(c)`

Will return:

Radius = 5.8310

Zavit = -0.5404

**10.** Write a function that receives as an input the three coefficients (a, b and c) of the quadratic equation  $ax^2 + bx + c = 0$  and returns the two roots  $x_1$  and  $x_2$  as output.

Reminder: the roots are calculated according to the formula:

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Use the function you wrote to calculate the roots of the equation:

$$5x^2 - 3x + 19 = 0$$