Week 2: Session 4

Vectors, Matrices, Arrays

Exercise 1

$$G = \begin{bmatrix} 10 & 40 & 20 \\ 6 & 20 & 1 \\ 3 & 2 & 0 \end{bmatrix}$$

Create the following Matrix:

1. find the transpose of ***G*** and save the result in the variable **GT**
2. print on display the element GT_{13}
3. print on display the second row of the **GT**
4. print on display the third column of the **GT**
5. replace the second row with 1 3 5 respectively, using proper operator

Exercise 2

$$H = \begin{bmatrix} 0 & 4 & 2 \\ 6 & 20 & 1 \\ 3 & 2 & 0 \end{bmatrix}$$

$$J = \begin{bmatrix} 1 & 6 & 3 \\ 4 & 2 & 2 \\ 2 & 1 & 0 \end{bmatrix}$$

Create the following Matrices:

1. Find the Matrix ***H+J***
2. Find the Matrix ***H * J***
3. Multiply ***H*** by ***J***, element-by-element

Exercise 3 Create a 1 x 10 vector K with random values ranged 0-5.

Exercise 4 Write one line of code to delete all the elements in K that are less than 2.5.

Exercise 5

Let's consider the following vector

$$A = [7 \quad 14 \quad 4 \quad 3 \quad 12 \quad 5 \quad 0 \quad 1]$$

1. Use Matlab code to find out if there is a 0 in A.
2. Use Matlab code to find out if the maximal value in A is 10.

Exercise 6

Create a Matlab variable named **Sample** to store the following table (exclude the first row).

Day	Average Temperature (deg Celsius)	Rainfall (mm)
1	25.4	3.2
2	21.6	2.1
3	24.3	1.6
4	27.5	0
5	28.4	0
6	22.7	1.9

1. Extract the first column of **Sample** and put the values in a variable named **Day.**
2. Extract the second column of **Sample** and put the values in a variable named **Temp.**
3. Extract the third column of **Sample** and put the values in a variable named **Rain.**
4. Line plot the "Day vs. Temp" and set the line to red ('r') and line width of 2.
5. On the same figure, bar plot the "Day vs. Rainfall".
6. Properly set up all the figure elements.

Exercise 7

For the above table (in Exercise 6),

1. Create 3 variables named **D, T,** and **R** to store the values in each column.
2. Combine the 3 variables into a 6x3 matrix and name it **S**.
3. Use the variable **S** to line plot the "Day vs. Temp" and set the line to black ('k') dashed ('--') and line width of 3. (hint: the first column of s represents Day and the second column represents Temperature.)
4. On the same figure, use the variable **S** to line plot the "Day vs. Rainfall" and set the line to red ('r') dash-dot ('-.') and line width of 3.
5. Properly set up all the figure elements.