CE640 / OC512 – MATLAB
Week 2 Assignment

**General homework notes:**
1. Submission is through Canvas only. Please do not email me homework.
2. Please create scripts in .m format (not .mlx).
3. If you use 'sections' (created with %% notation) for the individual questions, please ensure that each section runs cleanly on its own. It should not rely on results from previous sections. Use commands such as clear, home, clc or other to 'reset' the command window and workspace between individual questions.
4. While this first assignment is pretty straightforward, moving forward assignments and coding will become more complex and you will need to include ample 'comments' in your codes. This is part of good coding. Lack of comments will result in a lower score for your assignment. You do not need to write a novel, but your code needs to be clearly understood.
5. When you submit your assignment each week, I would like you to use the 'submission comments' portion of Canvas to report to me what you think your score (out of a perfect 10) should be. I will compare this to my assessment of your work to arrive at a final score.

**Week 2 Assignment:**
The purpose of this assignment is to make you comfortable with matrices and other data structures.

1. Use a method of your choice to create the row vector x having 100 regularly spaced values starting exactly at 6 and ending exactly at 39.
2. Use a method of your choice to create the column vector y having a regular spacing of 0.25 starting at -3 and ending at 12.
3. Create a vector x having six values starting at 0 and ending at 5. Create a matrix A whose first row is x, second row is 2x and third row is 3x + 10.
4. Create the matrix $A = \begin{bmatrix} 3 & 5 & 9 \\ 6 & 37 & 1 \\ 2 & 8 & 6 \end{bmatrix}$. For all of the following tasks, use matrix addressing and subsetting. Do not simply re-type the portions of the matrix that I am asking you for. Create the vector c that consists of the third row of A. Create the vector d that consists of the second column of A. Create a 1x2 array e that consists of the first and second rows of A. Create a 2x2 array that consists of the 4 corner elements of A.
5. For the above matrix A, use the 'sort' function to create two new matrices; one with each column sorted and one with each row sorted.
6. Given the two matrices $C = \begin{bmatrix} 6 & 7 \\ 2 & 9 \end{bmatrix}$ and $D = \begin{bmatrix} -9 & 3 \\ 7 & 5 \end{bmatrix}$, use element-by-element (careful!) math to add, subtract, multiply, and divide C and D. Next, create new matrices by vertically and horizontally concatenating C and D.

7. Using a method of your choice, create the following 2x2 cell array $A =$

$$\left\{ \begin{array}{cc} 'Matlab' & 'Simulink' \\ \begin{bmatrix} 3 & 9 \\ 8 & 2 \end{bmatrix} & \begin{bmatrix} 2 \\ 8 \\ 5 \end{bmatrix} \end{array} \right\}.$$

   a. How would you access the 'l' in 'Matlab' as a character?
   b. How would you access the word 'Simulink' as a character array? As a cell?
   c. How would you access the 8 in each of the two numeric arrays?
   d. Use the 'deal' function in to assign each cell in A to a variable of the appropriate type.

8. Let us go back to the idea of structures. Let us put together some data for CE 640 and OC 512. We could do this:

oc512student(1).firstname='Greg';
oc512student(2).firstname='Mary';
oc512student(1).lastname='Jones';
oc512student(2).lastname='Smith';
oc512student(1).examscore=[96 95];
oc512student(2).examscore=[87 75];

to create a structure for OC512 students. Next, I would like you to make a similar structure called ce640student. It needs to have the same fields. BUT, I would like you to make it have three entries per field. In other words, enter data (you can make it up) for three students, not two. Having done this, please figure out a way to concatenate your two structures into a single structure array called 'combined_students'.