CE640 / OC512 – MATLAB
Class 2 Assignment

The purpose of this assignment is to make you comfortable with matrices and other data structures.

You can, if you like, assemble these into a single m-file, with clear breaks between sections. Develop your code so that when I run it, the output is clear and obvious. Also, please use helpful and frequent comments throughout your code to explain what you are doing, i.e. "show your work."

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 $A = \begin{bmatrix} 3 & 5 & 9 \\ 6 & 37 & 1 \\ 2 & 8 & 6 \end{bmatrix}$. 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. Do all this by using indexing. Do NOT simply type in the numbers!
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 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 $A = \begin{Bmatrix} 'Matlab' & 'Simulink' \\ \begin{bmatrix} 3 & 9 \\ 8 & 2 \end{bmatrix} & \begin{bmatrix} 2 \\ 8 \\ 5 \end{bmatrix} \end{Bmatrix}$.
    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?
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’.