

ENED 1090: Engineering Models I
Homework Assignment #7
Due: Week of November 18th beginning of Recitation

Instructions:

1. Download the HW7 docx file and save it on your computer before editing it.
2. Download the HW7.mat file and the Roster.xlsx file and save them in your current MATLAB directory. At the command prompt, type `>> load HW7`. Look in your workspace window. You should see a 1-d array called *vector* (1x12), and a 2-d array called *matrix* (10x5).

Problem 1: Array Indexing

Execute the following commands first so you know what *vector* and *matrix* look like.

```
>> vector  
>> matrix
```

Don't change the values in *vector* or *matrix*. If you do inadvertently change them, just re-run the command `>> load HW7` to recover the original arrays.

This problem refers to the arrays *vector* and *matrix* downloaded from the HW7.mat file.

- a) Give a single MATLAB command that will pull out entries 5, 6, 7, 8, 9 out of the 1-d array, *vector* and put them in another vector called *vectorA*. **Show both your command and the results here:**

```
EDU>> vectorA = vector(5:1:9)  
  
vectorA =  
  
     2     2    -1     0    -4
```

- b) Give a single MATLAB command that will pull out entries 3, 9, and 11 out of the 1-d array, *vector* and put them in another vector called *vectorB*. **Show both your command and the results here:**

```
EDU>> vectorB = vector([3 9 11])  
  
vectorB =  
  
     3    -4     0
```

- c) Give a single MATLAB command that will overwrite the 3rd entry in *vectorB* with a value of 12. **Show both your command and the results here:**

```
EDU>> vectorB = vector([3 9 12])
```

```
vectorB =
```

```
    3    -4     5
```

- d) Give a single MATLAB command that will pull out rows 5, 6, and 7 out of the 2-d array, *matrix* and put them in another matrix called *matrixA*. **Show both your command and the results here:**

```
EDU>> matrixA = matrix(5:7, :)
```

```
matrixA =
```

```
    3    -3     3     1    -5
```

```
    4     3     2    -5     5
```

```
    0    -5     4     5    -4
```

- e) Give a single MATLAB command that will pull out columns 2, 3, and 4 out of the 2-d array, *matrix* and put them in another matrix called *matrixB*. **Show both your command and the results here:**

```
EDU>> matrixB = matrix(:, 2:4)
```

```
matrixB =
```

```
    2    -4     5
```

```
   -3     4    -2
```

```
    3     5    -4
```

```
    3     1    -1
```

```
   -3     3     1
```

```
    3     2    -5
```

```
   -5     4     5
```

```
    4    -2     2
```

```
   -1     0     2
```

```
    2    -4     0
```

Problem 2: Useful Array Functions (max, min, and sum)

This problem refers to the arrays *vector* and *matrix*, loaded from the HW7.mat file. Again, don't overwrite the values in the arrays *vector* and *matrix*. If you do, re-load HW7.mat.

- (a) What does the command: `Max = max(vector)` do? **Show the result and explain the result in words.**
- This command shows the highest number stored in the vector.

```
EDU>> Max = max (vector)

Max =

     5
```

(b) What does the command: `[Max Loc] = max(vector)` do? **Show the result and explain the result in words.**

a. This tells the maximum value stored in the vector and where it's located.

```
EDU>> [Max Loc] = max(vector)

Max =

     5

Loc =

    12
```

(c) What does the command: `Max = max(matrix)` do? **Show the result and explain the result in words.**

a. This shows the row with the highest values.

```
EDU>> Max = max(matrix)

Max =

     4     4     5     5     5
```

(d) What does the command: `[Max Loc] = max(matrix)` do? **Show the result and explain the result in words.**

a. This shows the largest entries stored within the matrix and where they are located.

```
EDU>> [Max Loc] = max(matrix)

Max =

     4     4     5     5     5

Loc =

     6     8     3     1     6
```

(e) What does the command: `Max = max(matrix, [], 2)` do? **Show the result and explain the result in words.**