

Assignment 5: Basic Matlab Operations

Date Due: March 1, 2012

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Problem 1

Use Matlab to solve this problem. Use the Command Window and define two matrices, A and B, in Matlab. Use (;) to separate the rows in the matrix and use square parenthesis to define the numerical values inside the matrix.

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

For example, A would be defined in Matlab as: `> A=[3 5 2; 4 6 1; 9 8 7]`

and $B = \begin{bmatrix} 23 & 12 & 5 \end{bmatrix}$

Perform the following matrix operations. In one line comment on the results obtained after each operation.

- a) $C = B \times A$
- b) $D = A(1,2:3)$
- c) $E = B'$
- d) $F = A \times B$
- e) $G = A(1,:) + B$
- f) $H = A(:,1)$
- g) $I = \text{diag}(A) + B'$
- h) $J = \text{ones}(3,3) + A$
- i) $x = \text{inv}(A) * B'$

Problem 2

Use Matlab to solve this problem.

a) Create a new Matlab script and define two vectors as follows:

$$x = 1:1:25$$

$$y = x.^2.*\exp(-x)$$

In your script make a simple plot using the “plot” function in Matlab. Label the x-axis as ‘Time (seconds)’ and the y axis as ‘Amplitude (dim)’. Add a grid to the plot using the ‘grid’ attribute of the plot.

b) Modify the script created in part (a) and using the interactive 'Tools-Edit Plot' adjust the color of the line to be red and the line width to be 4.0.

c) Modify the script created in part (a) by making the interval across the x -variable smaller. For example, try:

$$x = 1 : 0.01 : 25$$

Plot and comment on the solution.

Problem 3

Use Matlab to solve this problem. Define two vectors as follows:

```
airportNames={'Atlanta','Charlotte','Greenboro'};
```

```
passengers = [81e6 16e6 7.4e6];
```

Perform the following operations using Matlab. In one line comment on the results obtained after each operation.

- a) `B = airportNames(1)`
- b) `C = airportNames(1:2)`
- c) `D= airportNames{1}`
- d) Comment on any differences observed between variables B and D.
- e) `E = airportNames{1}(1)`
- f) `F = airportNames{1}(1:4)`
- g) `G = horzcat(airportNames(1),airportNames(2))`

Execute the following two commands sequentially.

- h) `H = find(passengers > 15e6)`
- i) `I = airportNames(H)`

Comment on the two operations executed sequentially.