Problem Set #2

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1) Use the help command and find the difference between clc, clear, and clf commands?

2) Create the following matrices using, ones, zeros, and diag commands.

i) $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

ii) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

iii) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

3) Define the matrices w, x and y in the Matlab command window

$$w = [0 \ 3 \ -2 \ 7]; x = [3 \ -1 \ 5 \ 7]; y = \begin{bmatrix} 1 & 3 & 7 \\ 2 & 8 & 4 \\ 6 & -1 & -2 \end{bmatrix}$$

and determine:

i) max(w)
ii) min(y)
iii) min(w, x)
iv) mean(y)
v) median(w)
vi) cumprod(y)
vii) sort (2*w+x)
viii) sort(y)

4) Define the following matrices:

$$A = \begin{bmatrix} 2 & 1 \\ 0 & -1 \\ 3 & 0 \end{bmatrix}; \ B = \begin{bmatrix} 1 & 3 \\ -1 & 5 \end{bmatrix}; C = \begin{bmatrix} 3 & 2 \\ -1 & -2 \\ 0 & 2 \end{bmatrix}; \ D = [1 \ 2]; \ I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Compute the matrix specified below.

i) D*B {= DB}
ii) B*C' {= BC^T}

iii) (C*B)*D' {= (CB) D^T}
iv) inv(B)*B {= $B^{-1}B$}
v) A*C' {= AC^T}
vi) inv(A*C') {=$(AC^T)^{-1}$}
vii) det (B)
viii) det(A*C') {=det ($A*C^T$)}

5) Practice plotting several trigonometric functions. Create a vector x to hold a series of x-axis values from 0 to 2Π.
x= 0.0: pi/100:2* pi ;

Define vector Y1 to be a function of vector x:
Y1= cos (x*4);

Plot the function using the following statement:
plot (x, Y1);

By default, the execution of a second plot statement will erase the first plot. You can layer plots on top of one another by using the hold on statement. Execute the following statements to ensure that both functions are plotted on the same graph.

y2= sin (x) ;
hold on ;
plot(x,y2) ;