

Solution to Second Quiz, February 12, 2014

1. Write the arrays that will be defined by the following MATLAB commands. If the command has an error, note the error.

a) `>> A = [1; 2; 3; 4]` $A = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$

b) `>> B = [5 6; 7 8; 9 10; 11 12]` $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \\ 9 & 10 \\ 11 & 12 \end{bmatrix}$

c) `>> C = [A B]` $C = \begin{bmatrix} 1 & 5 & 6 \\ 2 & 7 & 8 \\ 3 & 9 & 10 \\ 4 & 11 & 12 \end{bmatrix}$

d) `C = [A; B]` Error: A and B must have the same number of columns

e) `>> D = [A(2:4,1) B(1:3,2)]` $D = \begin{bmatrix} 2 & 6 \\ 3 & 8 \\ 4 & 10 \end{bmatrix}$

2. Write the MATLAB commands required to construct the following arrays.

$E = \begin{bmatrix} 1 & 2 & 2 & 6 \\ 3 & 5 & -6 & 10 \\ 12 & 7 & -9 & 4 \end{bmatrix}$ $E = [1 \ 2 \ 2 \ 6; 3 \ 5 \ -6 \ 10; 12 \ 7 \ -9 \ 4]$

$F = \begin{bmatrix} 1 & 4 & 7 \\ 0 & -2 & 9 \\ 2 & 6 & 0 \end{bmatrix}$ $F = [1 \ 4 \ 7; 0 \ -2 \ 9; 2 \ 6 \ 0]$

3. Describe the results of each of the pairs of MATLAB commands. What are the values of x, y, and z?

a) `>> t = 2:2:8`
`>> x = cos(t) .^ (t - 1)` x is a four element array with values $(\cos(2))^1$, $(\cos(4))^3$, $(\cos(6))^5$, and $(\cos(8))^7$

b) `>> t = 0:pi/4:pi`
`>> y = sin(t) ./ log(t+pi/4)` y is an array with values $\sin(0)/\log(\pi/4)$, $\sin(\pi/4)/\log(\pi/2)$, $\sin(\pi/2)/\log(3\pi/4)$, $\sin(3\pi/4)/\log(\pi)$, $\sin(\pi)/\log(5\pi/4)$,

c) `>> t = 10:12:34`
`>> z = sum(t)` $z = 10 + 22 + 34 = 68$

4. Using the arrays E and F from problem 2, what is the result of the MATLAB command $G = [E'; F]$?

$$G = \begin{bmatrix} 1 & 3 & 12 \\ 2 & 5 & 7 \\ 2 & -6 & -9 \\ 6 & 10 & 4 \\ 1 & 4 & 7 \\ 0 & -2 & 9 \\ 2 & 6 & 0 \end{bmatrix}$$

5. What would the G array from problem 4 look like following the command $G(2:4,2:3) = D$, where D is defined in problem 1?

$$G = \begin{bmatrix} 1 & 3 & 12 \\ 2 & 2 & 6 \\ 2 & 3 & 8 \\ 6 & 4 & 10 \\ 1 & 4 & 7 \\ 0 & -2 & 9 \\ 2 & 6 & 0 \end{bmatrix}$$