

Exercise on Array using MATLAB

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SECTION: CPE-401

DATE/TIME: Wednesday, 10:15am-1:15pm

SCORE: _____

- Note:** 1) Do not round off your answers but number such as 5.000 may simply be written as 5
- 2) Write your answers in the format such as the example given.

<p><u>Creating Vector with Constant Spacing</u></p> <p>EXAMPLE:</p> <pre>>> x = [1:2:15] x= 1 3 5 7 9 11 13 15</pre> <p>Answer the following</p> <pre>>> y = [1.5:0.1:2.2] y = 1.5000 1.6000 1.7000 1.8000 1.9000 2.0000 2.1000 2.2000</pre> <pre>>> z = [-2:6] z = -2 -1 0 1 2 3 4 5 6</pre> <pre>>> t = [21:-3:3] t = 21 18 15 12 9 6 3</pre> <pre>>> u = [2:5:19] u = 2 7 12 17</pre> <p><u>Creating Linearly spaced vector</u></p> <pre>>> xa = linspace(0,1,6) xa = 0 0.2000 0.4000 0.6000 0.8000 1.0000</pre> <pre>>> ya = linspace(30,10,7) ya = 30.000 26.667 23.333 20.000 16.667 13.333 10.000</pre> <p><u>Creating Two-Dimensional Array (Matrix)</u></p> <pre>>> A = [1 2 3; 4 5 6; 7 8 9] A = 1 2 3 4 5 6 7 8 9</pre> <pre>>> B = [-1 -2 -3 -4 -5 -6 -7 -8 -9] B = -1 -2 -3 -4 -5 -6 -7 -8 -9</pre>	<p><u>Transpose Operator</u></p> <p>Create: $D = \begin{bmatrix} 2 & 4 & 6 \\ 8 & 10 & 12 \end{bmatrix}$ and $E = [1 + i \quad 2 - i]$</p> <p>Answer the ff:</p> <pre>>> DT = D'</pre> <p>DT =</p> $\begin{bmatrix} 2 & 8 \\ 4 & 10 \\ 6 & 12 \end{bmatrix}$ <pre>>> ET = E'</pre> <p>ET =</p> $\begin{bmatrix} 1 - 1i \\ 2 + 1i \end{bmatrix}$ <pre>>> EE = E.'</pre> <p>EE =</p> $\begin{bmatrix} 1 + 1i \\ 2 - 1i \end{bmatrix}$ <pre>>> EE = E.' or >>EE=transpose(E)</pre> <p>EE =</p> $\begin{bmatrix} 1 + 1i \\ 2 - 1i \end{bmatrix}$ <p><u>Array Addressing</u></p> <p>Create the row vector : vect = [21 23 16 31 10 0]</p> <p>Answer the ff:</p> <pre>>> vect(3)</pre> <p>ans = 16</p> <pre>>>vect(3)+vect(6)</pre> <p>ans = 16</p> <pre>>> vect(6) = 25 (no need to write the result)</pre> <p>vect = 21 23 16 31 10 25</p> <pre>>>vect(3)+vect(6)</pre>
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<pre>>> C = [pi/2, cos(pi), log(2); sind(30), 5, 6] C = 1.5708 -1.0000 0.6931 0.5000 5.0000 6.0000</pre>	<pre>ans = 41 >> vect(1) + vect(2) + 0.1* vect(5) ans = 45 >> vect(2:5) ans = 23 16 31 10 >> vect(3:end) ans = 16 31 10 25 >> length(vect) ans = 6 >> size(vect) ans= 1 6</pre>
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<p><u>Array Addressing (continuation)</u></p> <p>Create the matrix:</p> $mat = \begin{bmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ -1 & -2 & -3 & -4 \end{bmatrix}$ <p>Answer the ff:</p> <pre>>> mat(2,4)</pre> <p>ans = 8</p> <pre>>> mat(1,2)-mat(3,2)</pre> <p>ans = 5</p> <pre>>> mat(3,2) = mat(1,4) (no need to write the result)</pre> <p>mat =</p> <pre>1 3 5 7 2 4 6 8 -1 7 -3 -4</pre> <pre>>> mat(1,2) – mat(3,2)</pre> <p>ans = -4</p> <pre>>> mat(:,1) ans = 1 2 -1</pre>	<p><u>Array Multiplication</u></p> <p>Create: $D = \begin{bmatrix} 1 & 4 & 2 \\ 3 & 7 & 5 \\ 8 & 1 & 4 \\ -1 & 3 & 6 \end{bmatrix}$ and $E = \begin{bmatrix} 1 & 6 \\ 2 & 4 \\ 5 & 4 \end{bmatrix}$</p> <p>Answer the ff: (some items here are intentionally made with error. Write the error message)</p> <pre>>>F=D*E F = 19 30 42 66 30 68 35 30</pre> <pre>>>G=E*D error: operator *: nonconformant arguments (op1 is 3x2, op2 is 4x3)</pre> <p><u>Element by Element Operation</u></p> <p>Create: $A = \begin{bmatrix} 2 & 6 & 5 \\ 5 & 8 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 & 10 \\ 2 & -2 & 3 \end{bmatrix}$</p> <p>Answer the ff:</p> <pre>>> A.*B ans = 2 24 50 10 -16 18</pre>
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<pre>>> mat(2,:) ans = 2 4 6 8 >> mat(:,2:4) ans = 3 5 7 4 6 8 7 -3 -4 >> mat(1:2,:) ans = 1 3 5 7 2 4 6 8 >> mat(2:3,1:3) ans = 2 4 6 -1 7 -3 >> size(mat) ans = 3 4</pre> <p><u>Array Addition and Subtraction</u> Create : vectA = [1 2 3] and vectB = [3 5 7] Answer the ff: >> vectC = vectA + vectB vectC = 4 7 10</p> <p>>> vectC – 5 ans = -1 2 5</p>	<pre>>> A*B error: operator *: nonconformant arguments (op1 is 2x3, op2 is 2x3) >> A./B ans = 2.0000 1.5000 0.5000 2.5000 -4.0000 2.0000 >> B.^2 ans = 1 16 100 4 4 9 >>B^2 error: for x^y, only square matrix arguments are permitted and one argument must be scalar. Use .^ for elementwise power.</pre>
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