Multi-Dimensional Array related problems
(Total 15 questions)

SL	Problem statement	Difficulty levels

<table>
<tr>
<td><b>1.</b></td>
<td>WAP that will take n integers into a sqrt(n) by sqrt(n) array (2D) and show them as traditional matrix view.
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>9
9 8 7 6 5 4 3 2 1</td><td>9 8 7
6 5 4
3 2 1</td></tr>
<tr><td>9
1 1 1 2 2 2 3 3 3</td><td>1 1 1
2 2 2
3 3 3</td></tr>
</table>
</td>
<td>*</td>
</tr>
<tr>
<td><b>2.</b></td>
<td>WAP that will take (m x n) integers into a <i>m by n</i> array (2D) and print them both row-wise and column-wise.
<table>
<tr><th>Sample input (m,n)</th><th>Sample output</th></tr>
<tr><td>2 3
1 2 3
6 5 4</td><td>Row-wise: 1 2 3 6 5 4
Column-wise: 1 6 2 5 3 4</td></tr>
<tr><td>3 3
1 1 1
2 2 2
3 3 3</td><td>Row-wise: 1 1 1 2 2 2 3 3 3
Column-wise: 1 2 3 1 2 3 1 2 3</td></tr>
</table>
</td>
<td>*</td>
</tr>
<tr>
<td><b>3.</b></td>
<td>WAP that will take inputs of a 3 by 3 matrix into a 2D array. Now find the determinant of this matrix. http://www.mathsisfun.com/algebra/matrix-determinant.html
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>1 2 3
4 5 6
7 8 9</td><td>0</td></tr>
</table>
</td>
<td>*</td>
</tr>
</table>

<table>
<tr>
<td><b>4.</b></td>
<td>WAP that will take inputs of a n sized square matrix into a 2D array. Now show all the elements of its two diagonals. Reference: http://en.wikipedia.org/wiki/Main_diagonal
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>5
1 2 3 4 5
5 4 3 2 1
2 2 2 2 2
6 7 8 9 0
1 9 3 7 4</td><td>Major diagonal: 1 4 2 9 4
Minor diagonal: 5 2 2 7 1</td></tr>
</table>
</td>
<td>*</td>
</tr>
<tr>
<td><b>5.</b></td>
<td>WAP that will take the size of an identity matrix from the user and generate the identity matrix into a 2D array. Finally display it. Reference:http://en.wikipedia.org/wiki/Identity_matrix
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>5</td><td>1 0 0 0 0
0 1 0 0 0
0 0 1 0 0
0 0 0 1 0
0 0 0 0 1</td></tr>
</table>
</td>
<td>*</td>
</tr>
<tr>
<td><b>6.</b></td>
<td>WAP that will take inputs of two <i>m x n</i> sized matrix into two 2D array, suppose A and B. Now do C = A + B. Finally display all the elements from matrix / 2D array C.
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>2 3
1 2 3
2 3 4
1 1 1
2 2 2</td><td>2 3 4
4 5 6</td></tr>
</table>
</td>
<td>*</td>
</tr>
<tr>
<td><b>7.</b></td>
<td>WAP that will take inputs of two <i>3 x 3</i> sized matrix into two 2D array, suppose A and B. Now do C = A * B (multiplication). Finally display all the elements from matrix / 2D array C.
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>1 2 3
4 5 6
7 8 9
2 2 2
2 2 2
1 1 1</td><td>9 9 9
24 24 24
39 39 39</td></tr>
</table>
</td>
<td>***</td>
</tr>
</table>

8. WAP that will take inputs of *m x n* sized matrix into a 2D array and find the maximum element with index locationfrom that matrix.

Sample input	**Sample output**

3 3
1 2 3
4 5 6
2 9 2
	Max: 9
	Location: [2][1]

2 3
9 8 7
3 4 5
	Max: 9
	Location: [0][0]

*

9. WAP that will take (n x n) integer inputs into a square matrix of dimension n (where n must be an odd number). Then calculate sum of the integers at first row, last row and two diagonals without overlap. Please see the sample input-output.

Sample input	**Sample output**

5
1 2 3 4 5
2 3 4 1 6
3 4 9 6 7
4 2 6 7 8
5 4 3 2 1
	52

7
1 1 1 1 1 1 1
1 1 1 1 1 1 1
1 1 1 1 1 1 1
1 1 1 1 1 1 1
1 1 1 1 1 1 1
1 1 1 1 1 1 1
1 1 1 1 1 1 1
	23

**

<table>
<tr>
<td><b>10.</b></td>
<td>WAP that will take (n x n) integer inputs into a square matrix of dimension n (where n must be an odd number). Then calculate sum of the integers based on following position pattern (consider only the boxed position during the sum). Please see the input-output.
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>5
$\boxed{1\ 2\ 3}\ 4\ \boxed{5}$
$2\ 3\ \boxed{4}\ 1\ \boxed{6}$
$\boxed{3\ 4\ 9\ 6\ 7}$
$\boxed{4}\ 2\ \boxed{6}\ 7\ 8$
$\boxed{5}\ 4\ \boxed{3\ 2\ 1}$</td><td>71</td></tr>
<tr><td>7
$\boxed{1\ 1\ 1\ 1}\ 1\ 1\ \boxed{1}$
$1\ 1\ 1\ \boxed{1}\ 1\ 1\ \boxed{1}$
$1\ 1\ 1\ \boxed{1}\ 1\ 1\ \boxed{1}$
$\boxed{1\ 1\ 1\ 1\ 1\ 1\ 1}$
$\boxed{1}\ 1\ 1\ \boxed{1}\ 1\ 1\ 1$
$\boxed{1}\ 1\ 1\ \boxed{1}\ 1\ 1\ 1$
$\boxed{1}\ 1\ 1\ \boxed{1\ 1\ 1\ 1}$</td><td>25</td></tr>
</table>
</td>
<td>**</td>
</tr>
<tr>
<td><b>11.</b></td>
<td>WAP that will take (n x n) integer inputs into a square matrix of dimension n (where n must be an odd number). Then calculate sum of the integers based on following position pattern (consider only the boxed position during the sum). Please see the input-output.
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>5
$1\ \boxed{2}\ 3\ \boxed{4}\ 5$
$\boxed{2\ 3\ 4\ 1\ 6}$
$3\ \boxed{4}\ 9\ \boxed{6}\ 7$
$\boxed{4\ 2\ 6\ 7\ 8}$
$5\ \boxed{4}\ 3\ \boxed{2}\ 1$</td><td>65</td></tr>
<tr><td>7
$1\ \boxed{1}\ 1\ \boxed{1}\ 1\ \boxed{1}\ 1$
$\boxed{1\ 1\ 1\ 1\ 1\ 1\ 1}$
$1\ \boxed{1}\ 1\ \boxed{1}\ 1\ \boxed{1}\ 1$
$\boxed{1\ 1\ 1\ 1\ 1\ 1\ 1}$
$1\ \boxed{1}\ 1\ \boxed{1}\ 1\ \boxed{1}\ 1$
$\boxed{1\ 1\ 1\ 1\ 1\ 1\ 1}$
$1\ \boxed{1}\ 1\ \boxed{1}\ 1\ \boxed{1}\ 1$</td><td>33</td></tr>
</table>
</td>
<td>**</td>
</tr>
</table>

12.

WAP that will take (m x n) integer inputs into a matrix of dimension m x n. Now reverse that matrix within itself and display it. Reversal means swap 1st column with the nth column, swap 2nd column with the (n-1)th column and so on…

Sample input	Sample output

3 3
1 2 3
4 5 6
2 9 2
	3 2 1
	6 5 4
	2 9 2

2 6
1 2 3 4 5 6
9 8 7 6 5 4
	6 5 4 3 2 1
	4 5 6 7 8 9

**

13.

WAP that will take (n x n) integer inputs into a square matrix of dimension n. Now determine whether the matrix is symmetric or not.

Reference: http://en.wikipedia.org/wiki/Symmetric_matrix

Sample input	Sample output

3
1 7 3
7 4 5
3 5 6
	Yes

2
1 3
4 2
	No

**

14.

WAP that will take (m x n) positive integer inputs into a matrix of dimension m x n. Now replace all the duplicate integers by -1 in that matrix. Finally display it.

Sample input	Sample output

3 3
1 7 3
7 4 5
3 5 6
	1 7 3
	-1 4 5
	-1 -1 6

2 6
2 2 2 2 2 2
6 5 4 3 2 1
	2 -1 -1 -1 -1 -1
	6 5 4 3 -1 1

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<table>
<tr>
<td><b>15.</b></td>
<td>WAP that will take (m x n) integer inputs into a matrix of dimension m x n. Now just simply add all the integers in that matrix and show the result.
<table>
<tr><th>Sample input</th><th>Sample output</th></tr>
<tr><td>3 3
1 7 3
7 4 5
3 5 6</td><td>41</td></tr>
<tr><td>2 6
2 2 2 2 2 2
6 5 4 3 2 1</td><td>33</td></tr>
</table>
</td>
<td>*</td>
</tr>
</table>