Multi-Dimensional Array related problems
(Total 15 questions)

<table>
<tr><th>SL</th><th>Problem statement</th><th>Difficulty levels</th></tr>
<tr><td>1.</td><td>WAP that will take 9 integers into a 3 by 3 array (2D) and show them as traditional matrix view.

<table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>9 8 7 6 5 4 3 2 1</td><td>9 8 7
6 5 4
3 2 1</td></tr><tr><td>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>2.</td><td>WAP that will take (m x n) integers into a m by n 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>3.</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>

4. 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

*

Sample input	Sample output
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	Major diagonal: 1 4 2 9 4 Minor diagonal: 5 2 2 7 1

5. 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

*

Sample input	Sample output
5	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

6. WAP that will take inputs of two *m x n* 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.

*

Sample input	Sample output
2 3 1 2 3 2 3 4 1 1 1 2 2 2	2 3 4 4 5 6

7. WAP that will take inputs of two *3 x 3* 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.

***

Sample input	Sample output
1 2 3 4 5 6 7 8 9 2 2 2 2 2 2 1 1 1	9 9 9 24 24 24 39 39 39

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

10. 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. **

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	71
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	25

11. 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. **

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	65
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	33

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

15.	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. **Sample input** 3 3 1 7 3 7 4 5 3 5 6 **Sample output** 41 **Sample input** 2 6 2 2 2 2 2 2 6 5 4 3 2 1 **Sample output** 33	*