Multi-Dimensional Array Related Questions

<table>
<tr><td></td><td></td></tr>
<tr><td>1</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></tr>
<tr><td>2</td><td>WAP that will take inputs of a 3 by 3 matrix into a 2D array. Now find the determinant of this matrix.

<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></tr>
<tr><td>3</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.

<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></tr>
<tr><td>4</td><td></td></tr>
</table>

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

5 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

Finding the Determinant of a Three-By-Three Matrix

$$A = \begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$$

$$\det(A) = a_1 \begin{vmatrix} b_2 & b_3 \\ c_2 & c_3 \end{vmatrix} - a_2 \begin{vmatrix} b_1 & b_3 \\ c_1 & c_3 \end{vmatrix} + a_3 \begin{vmatrix} b_1 & b_2 \\ c_1 & c_2 \end{vmatrix}$$

$$= a_1(b_2c_3 - b_3c_2) - a_2(b_1c_3 - b_3c_1) + a_3(b_1c_2 - b_2c_1)$$