**Multi-Dimensional Array related problems**

**(Total 15 questions)**

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| **SL** | **Problem statement** | **Difficulty levels** |

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|  | WAP that will take 9 integers into a 3 by 3 array (2D) and show them as traditional matrix view.     |  |  | | --- | --- | | **Sample input** | **Sample output** | | 9 8 7 6 5 4 3 2 1 | 9 8 7  6 5 4  3 2 1 | | 1 1 1 2 2 2 3 3 3 | 1 1 1  2 2 2  3 3 3 | | \* |
|  | WAP that will take (m x n) integers into a *m by n* array (2D) and print them both row-wise and column-wise.     |  |  | | --- | --- | | **Sample input (m,n)** | **Sample output** | | 2 3  1 2 3  6 5 4 | Row-wise: 1 2 3 6 5 4  Column-wise: 1 6 2 5 3 4 | | 3 3  1 1 1  2 2 2  3 3 3 | Row-wise: 1 1 1 2 2 2 3 3 3  Column-wise: 1 2 3 1 2 3 1 2 3 | | \* |
|  | 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>   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 1 2 3  4 5 6  7 8 9 | 0 | | \* |
|  | 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 | | \* |
|  | 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 | | \* |
|  | 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 | | \* |
|  | 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 | | \*\*\* |
|  | 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] | | \* |
|  | 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 | | \*\* |

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|  | 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 | | \*\* |
|  | 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 | | \*\* |

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|  | 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 | | \*\* |
|  | 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 | | \*\* |
|  | 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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|  | 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** | **Sample output** | | 3 3  1 7 3  7 4 5  3 5 6 | 41 | | 2 6  2 2 2 2 2 2  6 5 4 3 2 1 | 33 | | \* |