

2D ARRAY

1. Create a 5 x 3 integer array. Fill it with random numbers between 30 and 50. Print the array.
2. Create two 4 by 3 integer matrices called A and B. Subtract A from B and store the resultant matrix in C. Print A, B and C matrices.
3. Take the size of a matrix, A, from the user. Create the matrix, A, and fill it with user input. Then store the transpose of A in another matrix B. Print both A and B.
4. Create a 4 by 3 integer matrices called A and a 3 by 2 integer matrix called B. Fill both matrices with random numbers. Multiply A and B and store the resultant matrix in C. Print A, B and C.
5. Count the number of prime numbers in a 2D integer array.
6. Compute the average value of each of the rows of a 15 x 10 floating point array.
7. Convert a 5 x 7 (2D) integer array to a 1D array.
8. Convert a 1D array of size 10 to a 2 x 5 or 5 x 2 (2D) array (make sure no data is lost).
9. Create a 5 x 5 matrix. Compute the sum of the values along the two diagonals. Print the sums separately.
10. Create an 8 x 8 chessboard pattern using the extended ASCII codes.
11. **Challenge problem:** Create a 7 x 7 magic square using a 2D array. Magic square is a square where the sum of every row and column and diagonal is the same. For example, a 3 x 3 magic square looks like:

2	7	6	→15
9	5	1	→15
4	3	8	→15
↙15	↓15	↓15	↘15

12. **Challenge problem:** Write a Tic-Tac-Toe game where the computer never loses.