Two Dimensional Array

Question1:

Create a function that takes a 2D matrix and a target value as input and returns True if the target value exists in the matrix, otherwise returns False.

Example1:
Input:

matrix =

1	4	7	11	15
2	5	8	12	19
3	6	9	16	22
10	13	14	17	24
18	21	23	26	30

target = 5

Output:

True

Example2:
Input:

matrix =

1	4	7	11	15
2	5	8	12	19
3	6	9	16	22
10	13	14	17	24
18	21	23	26	30

target = 99

Output:

False

Question2:

Create a function that takes two matrices of the same shape as input and returns their summation matrix.

Example1:
Input:

Matrix1 =

2	2	1
1	5	0
0	0	1

Matrix2 =

5	7	1
0	3	0
1	0	8

Output:

Resulted_Matrix =

7	9	2
1	8	0
1	0	9

Question3:

Write a function to calculate the sum of the main diagonal elements of a square matrix.

Example1:
Input:

matrix =

1	2	3
4	5	6
7	8	9

Output:

Question4:

Create a function that takes two matrices as input and multiply those two matrices. Return the resulting matrix.

Example1:
Input:

matrix1 =

1	2	3
4	5	6

matrix2 =

10	11
20	21
30	31

Output:

resulted_matrix =

140	146
320	335

Question5:

Write a function that takes a 2D matrix as input. If any element in the matrix is 0, the function should set all elements in that element's row and column to 0. The changes should be made directly to the original matrix (in-place).

Example1:
Input:

matrix =

1	1	1
1	0	1
1	1	1

Output:

resulted_matrix =

1	0	1
0	0	0
1	0	1

Example2:
Input:

matrix =

1	2	0
4	5	6
7	8	9

Output:

resulted_matrix =

0	0	0
4	5	0
7	8	0

Question6:

Create a function that takes a 2D matrix as input and returns an array of its boundary elements in the order they are encountered during a boundary traversal. The boundary traversal should start from the top-left corner and go clockwise around the matrix.

Example1:
Input:

matrix =

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Output:

[1, 2, 3, 4, 8, 12, 16, 15, 14, 13, 9, 5]

Question7:

Create a function that takes a 2D square matrix as input and modifies it to become its transpose in-place.

Example1:
Input:

matrix =

1	2	3
4	5	6
7	8	9

Output:

transposed_matrix =

1	4	7
2	5	8
3	6	9

Question8:

Create a function that takes an $n \times n$ 2D matrix representing an image and rotates the image by 90 degrees clockwise. The rotation should be done in-place.

Example1:
Input:

image =

1	2	3
4	5	6
7	8	9

Output:

rotated_image =

7	4	1
8	5	2
9	6	3