A - Diagonal Traversal of Matrix

Given a 2D matrix of size NxN, print the sum of the elements of all its diagonals.

**Input Format**

First line of input contains T - number of test cases. First line of each test case contains N - size of the matrix. Each of the next N lines contains N integers - the elements of the matrix.

**Constraints**

1 <= T <= 100  
1 <= N <= 100  
-100 <= ar[i][j] <= 100

**Output Format**

For each test case, print the sum of the elements of all the diagonals, separated by newline. Refer samples for more clarity.

**Sample Input 0**

4

3

-5 0 4

2 8 -6

3 7 1

1

-4

2

5 -2

-4 1

6

-2 -3 -6 -5 50 3

8 7 10 -5 -3 30

6 3 70 9 -20 -7

-9 9 -6 7 3 2

-1 7 7 6 -4 3

8 5 6 -9 40 8

**Sample Output 0**

4 -6 4 9 3

-4

-2 6 -4

3 80 -15 -29 22 86 51 13 4 4 8

**Explanation 0**

**Test Case 1**  
Sum of the elements of the 1st diagonal: 4  
Sum of the elements of the 2nd diagonal: 0 + -6 = -6  
Sum of the elements of the 3rd diagonal: -5 + 8 + 1 = 4  
Sum of the elements of the 4th diagonal: 2 + 7 = 9  
Sum of the elements of the 5th diagonal: 3

**Test Case 2**  
Sum of the elements of the 1st and only diagonal: -4

**Test Case 3**  
Sum of the elements of the 1st diagonal: -2  
Sum of the elements of the 2nd diagonal: 5 + 1 = 6  
Sum of the elements of the 3rd diagonal: -4

#include <iostream>

#include <vector>

using namespace *std*;

void fill2DMatrix(*vector*<*vector*<int>>& matrix)

{

int ele;

int rows = matrix.*size*(), cols = matrix[0].*size*();

for (auto i = 0; i < rows; i++)

{

for (auto j = 0; j < cols; j++)

{

*cin* >> ele;

matrix[i][j] = ele;

}

}

}

void findDiagonalSum(*vector*<*vector*<int>>& matrix)

{

int n = matrix.*size*();

for (auto k = 1; k <= n ; k++)

{

int diaSum = 0;

int i = 0, j = n-k;

while (j < n)

{

diaSum += matrix[i][j];

//cout << i << j << " ";

i++; j++;

}

*cout* << diaSum << " ";

}

for (auto k = 0; k < n-1; k++)

{

int diaSum = 0;

int i = k + 1, j = 0;

while (i < n)

{

diaSum += matrix[i][j];

//cout << i << j << " ";

i++; j++;

}

*cout* << diaSum << " ";

}

}

int main()

{

int t;

*cin* >> t;

while (t--)

{

int n;

*cin* >> n;

*vector*<*vector*<int>> matrix(n, *vector*<int>(n));

fill2DMatrix(matrix);

findDiagonalSum(matrix);

*cout* << *endl*;

}

return 0;

}