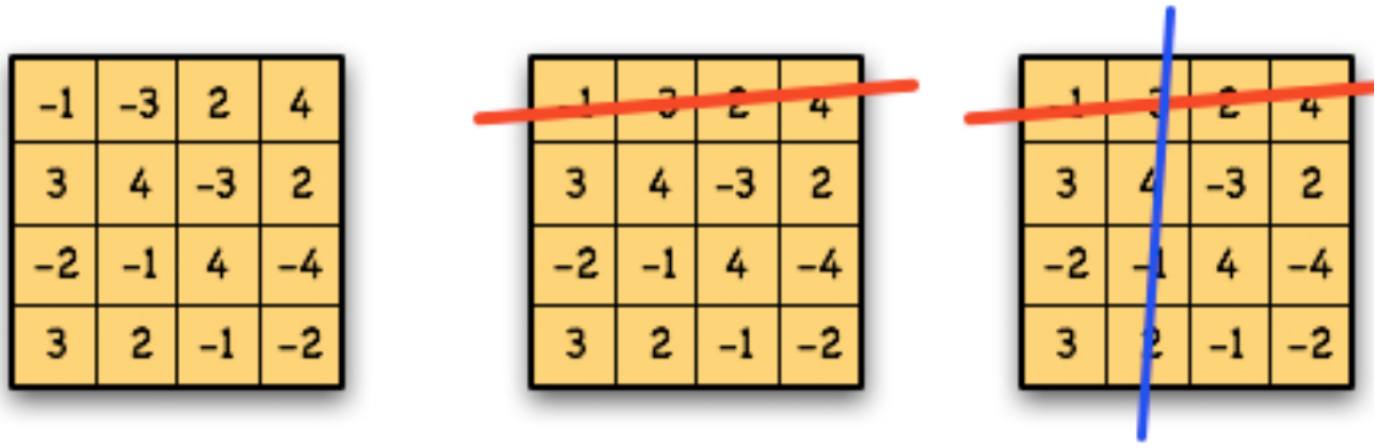
Alice and Bob both have lots of candies but want more. They decide to play the following turn-bas game.

They fill an $n \times n$ grid M with random integers. Alice begins the game by crossing off an uncross row i of the grid. Now it's Bob turn and he crosses off an uncrossed column j of the grid. At t end of Bob's turn, Alice takes the number candies in the i-th row and j-th column of M, call th value $M(i, j)$, from Bob. (If $M(i, j)$ is negative, then Alice gives $|M(i, j)|$ candies to Bob.) The gar continues alternating turns from Alice to Bob until the entire board is crossed off.

What is the largest amount of candies that Alice can win from Bob (or least amount to lose if s cannot win) if both Alice and Bob play optimally?



The beginning of a game between Alice (red) and Bob (blue).

Input

The first line of the input contains an integer t ($1 \leq t \leq 20$), the number of test cases. Each test ca starts with n ($1 \leq n \leq 8$), the size of the grid. Then follow n lines containing n numbers separated spaces describing M. We call the j-th number on i-th line $M(i, j)$ ($-1000 \leq M(i, j) \leq 1000$).

Output

For each test case, print the largest amount of candies that Alice can win from Bob. If she cannot wi print the negative number indicating the minimum number of candies she loses.

Sample Input

```
3
2
10 10
-5 -5
2
10 -5
10 -5
2
10 -5
-5 10
```

Sample Output

```
5
5
-10
```