



4529 - A Constrained Queen Game

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Fig. 1 shows a well-known 8-queen problem solution in an 8×8 chess board. The problem is to place 8 queens in a chess board so that none of them is able to capture any other using the standard chess queen's moves.

Now, the chess board size can be $N \times N$ and you need to place N queens in the game. Besides, each square in the chess board has a score. The score is a positive integer (at most 5000) and is provided as part of the test data.

Let the score on square (i, j) be $score(i, j)$. The scores provided for a chess board follow a rule:

$$score(i, j) < score(s, t) \text{ if } (s > i \text{ and } t \geq j) \text{ or } (s \geq i \text{ and } t > j)$$

According to this rule, the scores on the board always increase toward right, bottom and right-bottom corner. A solution of N queens now has a total score, which is the sum of scores of N queens. Given an $N \times N$ chess board, please find the maximum total score that can be produced by a valid solution.

Technical Specification

$$1. \ 8 \leq N \leq 16$$

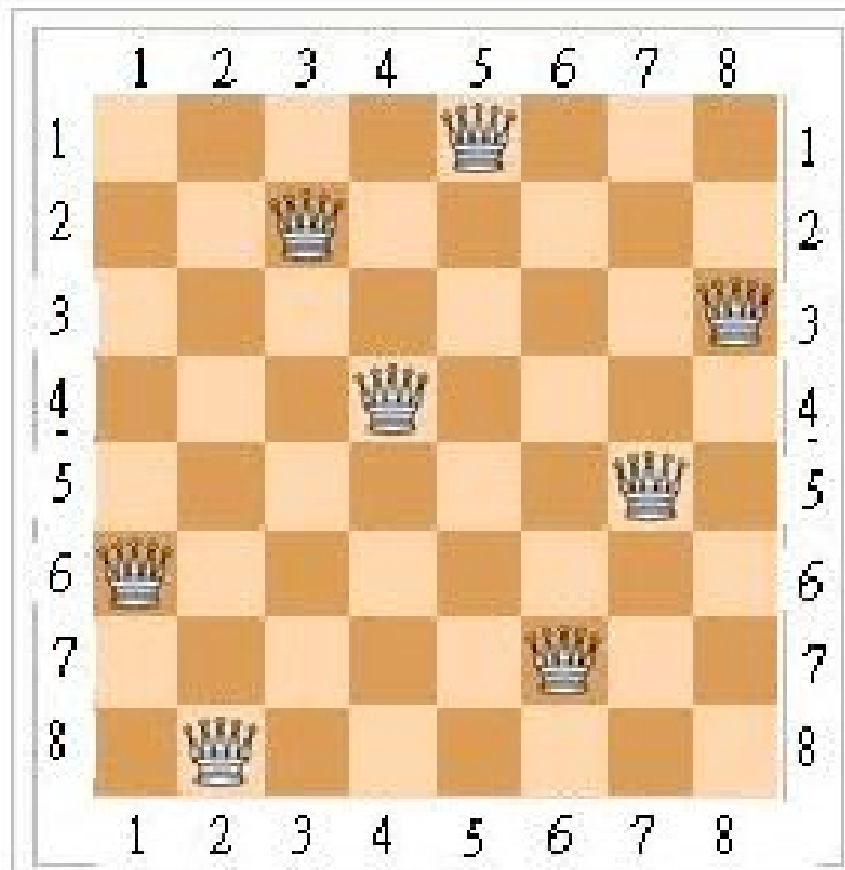


Figure 1: A solution to the 8-queen problem.

Input

The first line of the input file contains an integer indicating the number of test cases (at most 10 cases) to follow. Each test case begins a number N which is the number of queens. Following N is $N \times N$ scores for all the squares. These scores are listed in row major. For example, in an 8×8 queen board, the first eight scores are for squares indexed (1, 1),(1, 2),(1, 3)...(1, 8).

Output

For each test case, please output the maximum total score that can be produced by a valid solution.

Sample Input

```

1
8
1 2 3 4 5 6 7 8
2 4 6 8 10 12 14 16
3 6 9 12 15 18 21 24
4 8 12 16 20 24 28 32
5 10 15 20 25 30 35 40
6 12 18 24 30 36 42 48
7 14 21 28 35 42 500 550
8 16 24 32 40 48 550 999

```

Sample Output

1097

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