Problem E
Y Pentomino

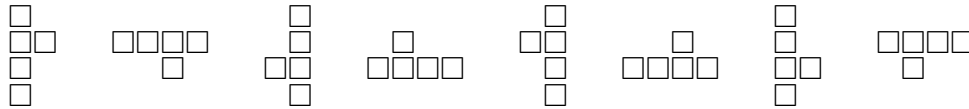## Problem Description

A Y pentomino is a piece of five connected tiles in the following shape:

Considering all possible combinations of rotation and flip, we have eight ways to place a Y pentomino on a board:

We can cover a board of 10×10 cells using 20 Y pentominoes. Each cell on the board has a specific value indicated by a positive integer. If we place a Y pentomino at some position on the board, the Y pentomino covers five values and we obtain a score as the difference between the maximum value and the minimum value. For example, if we place a Y pentomino on a board as shown below, we get a score of 6 because $\max\{1, 2, 3, 5, 7\} - \min\{1, 2, 3, 5, 7\} = 6$.

1	2	3	6	5	4
2	3	5	7	1	5
1	6	5	2	3	5
6	5	4	4	5	6

Task: Given a 10-by-10 board with a specific configuration of values and 20 Y pentominoes, we need to place all of the 20 Y pentominoes onto the board and maximize the total score.

1

Technical Specifications

1. The number of test cases would be smaller than or equal to 20.

2. The value of a board cell would be a positive integer less than 100.

Input Format

The first line of the input file contains an integer indicating the number of test cases to follow. Each test case contains 10×10 integers corresponding to the values on the 10-by-10 board. More specifically, these 100 integers are listed in 10 lines, each of which contains 10 integers separated by spaces. There is a blank line between two test cases.

Output Format

For each test case, compute the highest total score that can be obtained when 20 Y pentominoes are placed on the board. The answers have to be listed line by line. Each line contains an answer of a single test case.

Sample Input

```
2
6 1 1 1 1 1 1 1 1 1
7 1 1 1 1 1 1 1 1 1
8 1 1 1 1 1 1 1 1 1
9 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1

1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
```

```
1 2 3 4 5 5 4 3 2 1
1 2 3 4 5 5 4 3 2 1
```

The following placement is one of the solutions that can achieve the highest score 13 for the first test case:

6	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1

For the second test case, the highest score is 48, which can be obtained by a placement shown below.

1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1
1	2	3	4	5	5	4	3	2	1

Sample Output

```
13
48
```