Problem I. Rake It In

The designers have come up with a new simple game called "Rake It In". Two players, Alice and Bob, initially select an integer k and initialize a score indicator. An 4×4 board is created with 16 values placed on the board. **Starting with player Alice**, each player in a round selects a 2×2 region of the board, adding the sum of values in the region to the score indicator, and then rotating these four values 90 **degrees counterclockwise**.

After $2k$ rounds in total, each player has made decision in k times. The ultimate goal of **Alice** is to **maximize the final score**. However for **Bob**, his goal is to **minimize the final score**.

In order to test how good this game is, you are hired to write a program which can play the game. Specifically, given the starting configuration, they would like a program to determine the final score when **both players are entirely rational**.

Input

The input contains several test cases and the first line provides an integer t ($1 \leq t \leq 200$) which is the number of test cases.

Each case contains five lines. The first line provides the integer k ($1 \leq k \leq 3$). Each of the following four lines contains four integers indicating the values on the board initially. All values are integers between 1 to 10.

Output

For each case, output an integer in a line which is the predicted final score.

Sample

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