UCF "Practice" Local Contest — Aug 29, 2015

Knight Moves – Gold Edition

filename: `goldknight`
(*Difficulty Level:* `Hard`)

You have a chessboard of size N x N. The rows and columns are numbered from 1 to N. In a cell located at row R_1 and Column C_1, a knight is starting his journey. The knight wants to go to the cell located at row R_2 and Column C_2. Move the knight from the starting cell to this destination cell with minimum number of moves.
As a reminder, a knight's jump moves him 2 cells along one of the axes, and 1 cell along the other one. In other words, if a knight is at (A,B), it may move to (A-2,B -1), (A-2, B+1), (A+2, B-1), (A+2, B+1), (A-1, B-2), (A+1,B-2), (A-1, B+2) or (A+1, B+2). Of course, the knight cannot leave the board.

The Problem:

Given N, R_1, C_1, R_2 and C_2, determine the minimum number of steps necessary to move the knight from (R_1, C_1) to (R_2, C_2).

The Input:

The first input line contains a positive integer, *T*, indicating the number of test cases. Each case consists of a line containing five integers N ($3 \leq N \leq 20$), R_1, C_1, R_2 and C_2 ($1 \leq R_1, C_1, R_2, C_2 \leq N$).

The Output:

For each test case, first output "`Case #i:`" where `i` is the test case number, starting with 1. Then, output the minimum number of steps needed to move the knight from (R_1, C_1) to (R_2, C_2). Assume that there will always be a solution, i.e., it's possible to move the knight from its starting cell to its destination cell. Leave a blank line after the output for each test case. Follow the format illustrated in Sample Output.

Sample Input:

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

Sample Output:

```
Case #1: 1

Case #2: 4
```