



KnightL on a Chessboard ☆

210/563 challenges solved

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Problem

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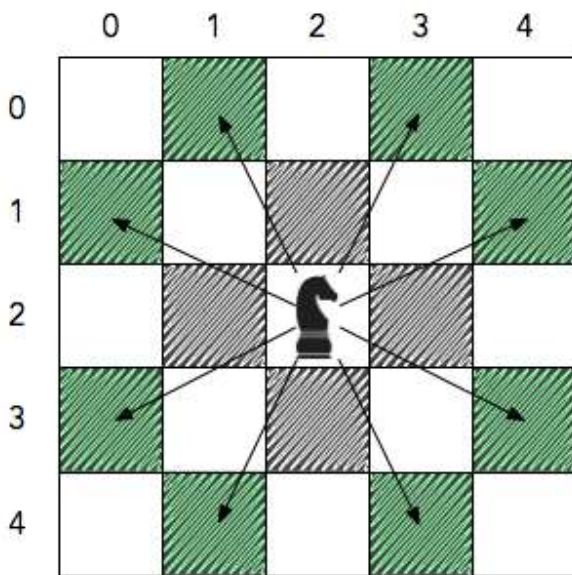
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KnightL is a chess piece that moves in an L shape. We define the possible moves of **KnightL**(a, b) as any movement from some position (x_1, y_1) to some (x_2, y_2) satisfying either of the following:

- $x_2 = x_1 \pm a$ and $y_2 = y_1 \pm b$, or
- $x_2 = x_1 \pm b$ and $y_2 = y_1 \pm a$

Note that (a, b) and (b, a) allow for the same exact set of movements. For example, the diagram below depicts the possible locations that **KnightL**(1, 2) or **KnightL**(2, 1) can move to from its current location at the center of a 5×5 chessboard:



Observe that for each possible movement, the Knight moves **2** units in one direction (i.e., horizontal or vertical) and **1** unit in the perpendicular direction.

Given the value of n for an $n \times n$ chessboard, answer the following question for each (a, b) pair where $1 \leq a, b < n$:

- What is the minimum number of moves it takes for **KnightL**(a, b) to get from position $(0, 0)$ to position $(n - 1, n - 1)$? If it's not possible for the Knight to reach that destination, the answer is -1 instead.

Then print the answer for each **KnightL**(a, b) according to the Output Format specified below.

Input Format

A single integer denoting n .

Constraints



- $5 \leq n \leq 25$

Output Format

Print exactly $n - 1$ lines of output in which each line i (where $1 \leq i < n$) contains $n - 1$ space-separated integers describing the minimum number of moves $KnightL(i, j)$ must make for each respective j (where $1 \leq j < n$). If some $KnightL(i, j)$ cannot reach position $(n - 1, n - 1)$, print -1 instead.

For example, if $n = 3$, we organize the answers for all the (i, j) pairs in our output like this:

(1, 1) (1, 2)
(2, 1) (2, 2)

Sample Input 0

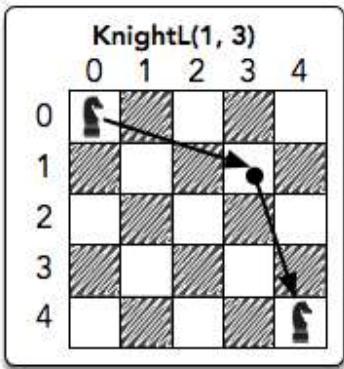
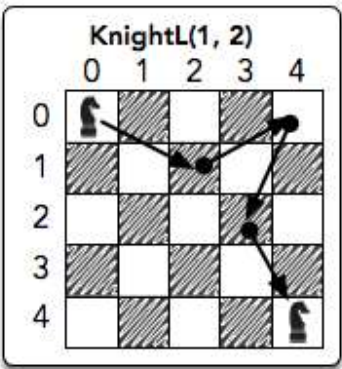
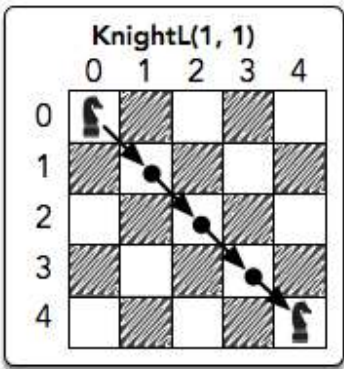
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Sample Output 0

4 4 2 8
4 2 4 4
2 4 -1 -1
8 4 -1 1

Explanation 0

The diagram below depicts possible minimal paths for $KnightL(1, 1)$, $KnightL(1, 2)$, and $KnightL(1, 3)$:



One minimal path for $KnightL(1, 4)$ is:

$$(0, 0) \rightarrow (1, 4) \rightarrow (2, 0) \rightarrow (3, 4) \rightarrow (4, 0) \rightarrow (0, 1) \rightarrow (4, 2) \rightarrow (0, 3) \rightarrow (4, 4)$$




We then print 4 4 2 8 as our first line of output because $KnightL(1, 1)$ took 4 moves, $KnightL(1, 2)$ took 4 moves, $KnightL(1, 3)$ took 2 moves, and $KnightL(1, 4)$ took 8 moves.

In some of the later rows of output, it's impossible for $KnightL(i, j)$ to reach position (4, 4). For example,



KnightL(3,3) can only move back and forth between **(0,0)** and **(3,3)** so it will never reach **(4,4)**.

Java 8



1

Line: 1 Col: 1

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