

Problem 5.5 Viral Spiral: A Concern at CERN

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Overview: Output the sum of all neighbors of a cell in an $n \times n$ number spiral.

Description: The aptly-named *Spiroviro* virus has infected the computer grid at CERN. Starting from the northwest corner of the basement computer cluster, *Spiroviro* proceeds to spread clockwise along the computers on the edge, which have lower priority access to the networked antivirus scan. Each new infection causes exactly one more damage than the last, as measured by a special BleederMeterReader.

Given a size n and a computer at location (x, y) , where x increases to the south and y increases to the east, help CERN determine the sum of the damage dealt by *Spiroviro* to neighboring computers. For example, for $n = 5$, the computer grid would exhibit a damage pattern of

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      1  2  3  4  5
    16 17 18 19  6
    15 24 25 20  7
    14 23 22 21  8
    13 12 11 10  9

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with $(1, 1) = 1$, $(3, 5) = 7$, and $(4, 2) = 23$. Neighboring computers are defined in the cardinal directions. That is, the neighbors of $(1, 1)$ are $(1, 2)$ and $(2, 1)$; the neighbors of $(4, 2)$ are $(3, 2)$, $(4, 1)$, $(4, 3)$, and $(5, 2)$.

Time Allocation: 1 second

Input: The first line contains an integer n , representing the side length of the square computer grid. The second line contains two integers x y , separated by exactly one space.

Output: The output should consist of a single integer k representing the sum of the damages dealt to all computers neighboring the (x, y) location in the $n \times n$ computer grid.

The output is to be formatted exactly like the sample output given below.

Assumptions: n will be an integer between 1 and 1000, inclusive.
 x and y will each be an integer between 1 and n , inclusive.
 k will be an integer between 1 and 4,000,000, inclusive.
All input will be valid.

Sample Input #1: 5
4 2

Sample Output #1: 72

Sample Input #2: 5
4 1

Sample Output #2: 51