

## Problem D

# Displacing Particles

A square has its vertices at the coordinates  $(0, 0)$ ,  $(0, 2^N)$ ,  $(2^N, 2^N)$ ,  $(2^N, 0)$ . Each vertex has an attractor. A particle is placed initially at position  $(2^{N-1}, 2^{N-1})$ . Each attractor can be activated individually, any number of times. When an attractor at position  $(i, j)$  is activated, if a particle is at position  $(p, q)$ , it will be moved to the midpoint between  $(i, j)$  and  $(p, q)$ .

Given  $N$  and a point  $(x, y)$ , calculate the least number of times you have to activate the attractors so that the particle ends up at position  $(x, y)$ .

### Input

The input consists of a single line containing three integers  $N$ ,  $x$  and  $y$ , such that  $1 \leq N \leq 20$  and  $0 < x, y < 2^N$ .

### Output

Print a single line, containing the least number of times you have to active the attractors.

<b>Input example 1</b> 1 1 1	<b>Output example 1</b> 0
<b>Input example 2</b> 4 12 4	<b>Output example 2</b> 1
<b>Input example 3</b> 4 3 1	<b>Output example 3</b> 3