

# Problem L

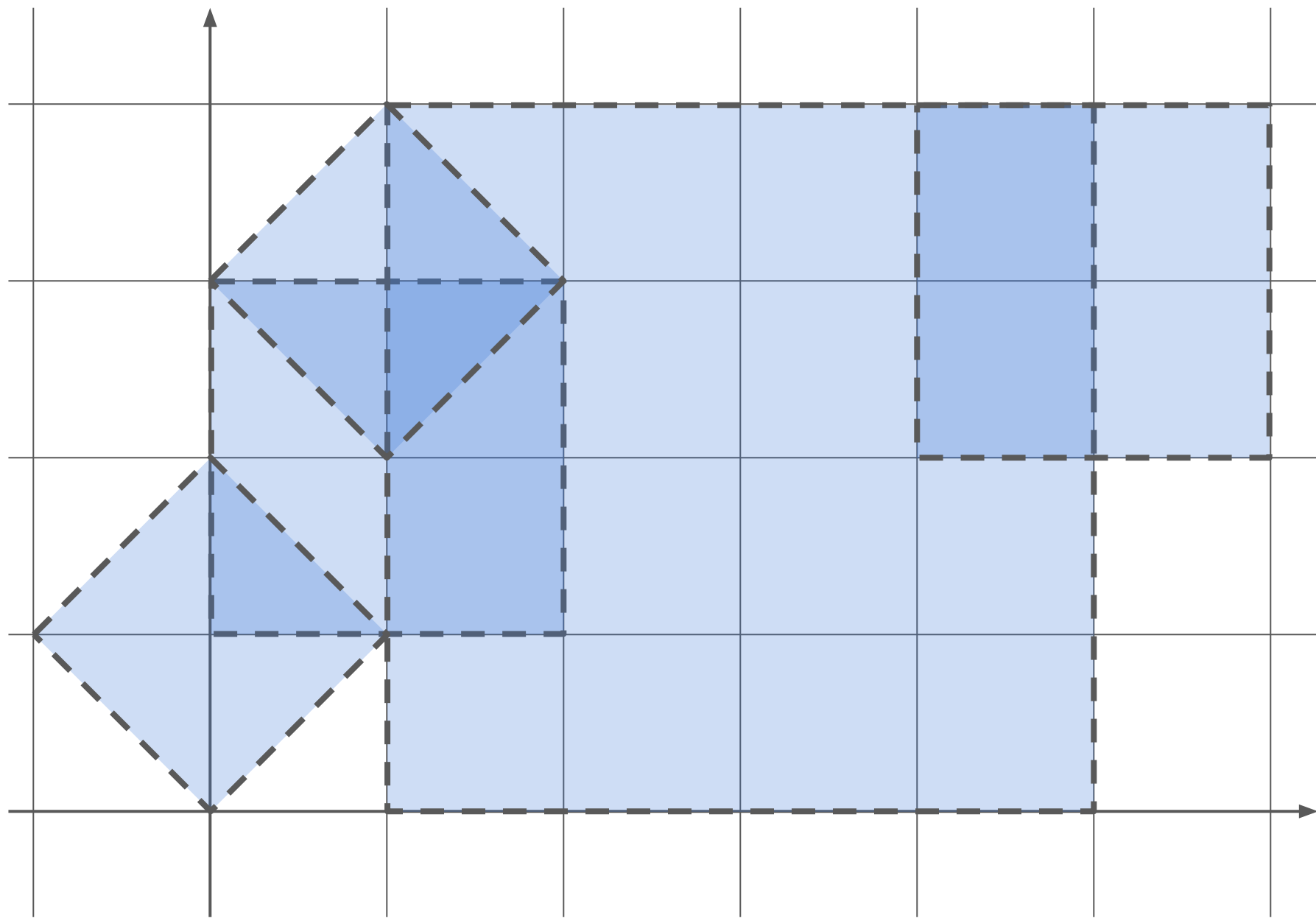
## Lunar Landscape

Submits: 41

Accepted: at least 5

First solved by: UW2  
University of Warsaw  
(Boguta, Czajka, Farbiś)  
02:02:13

Author: Luka Kalinovčić

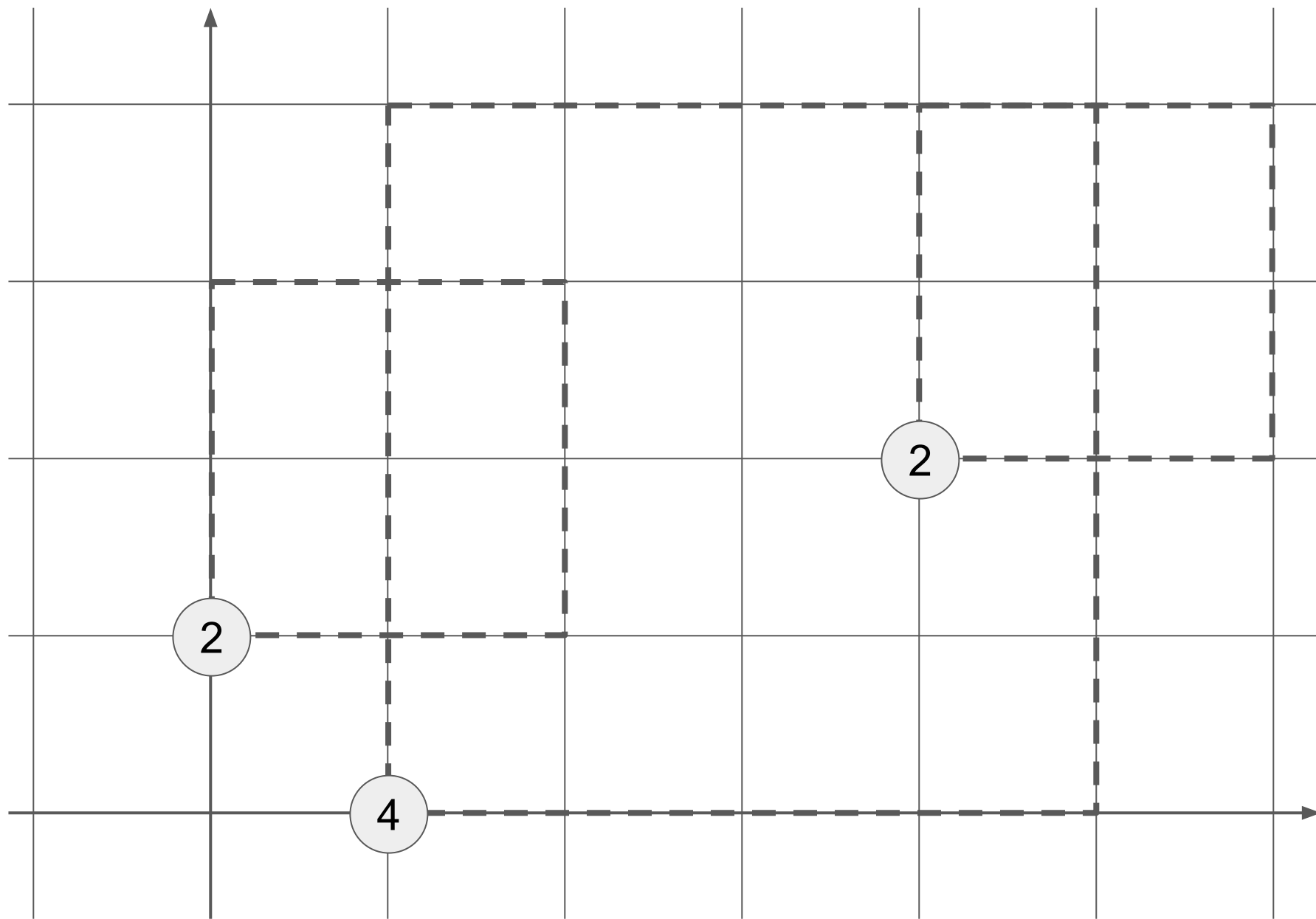


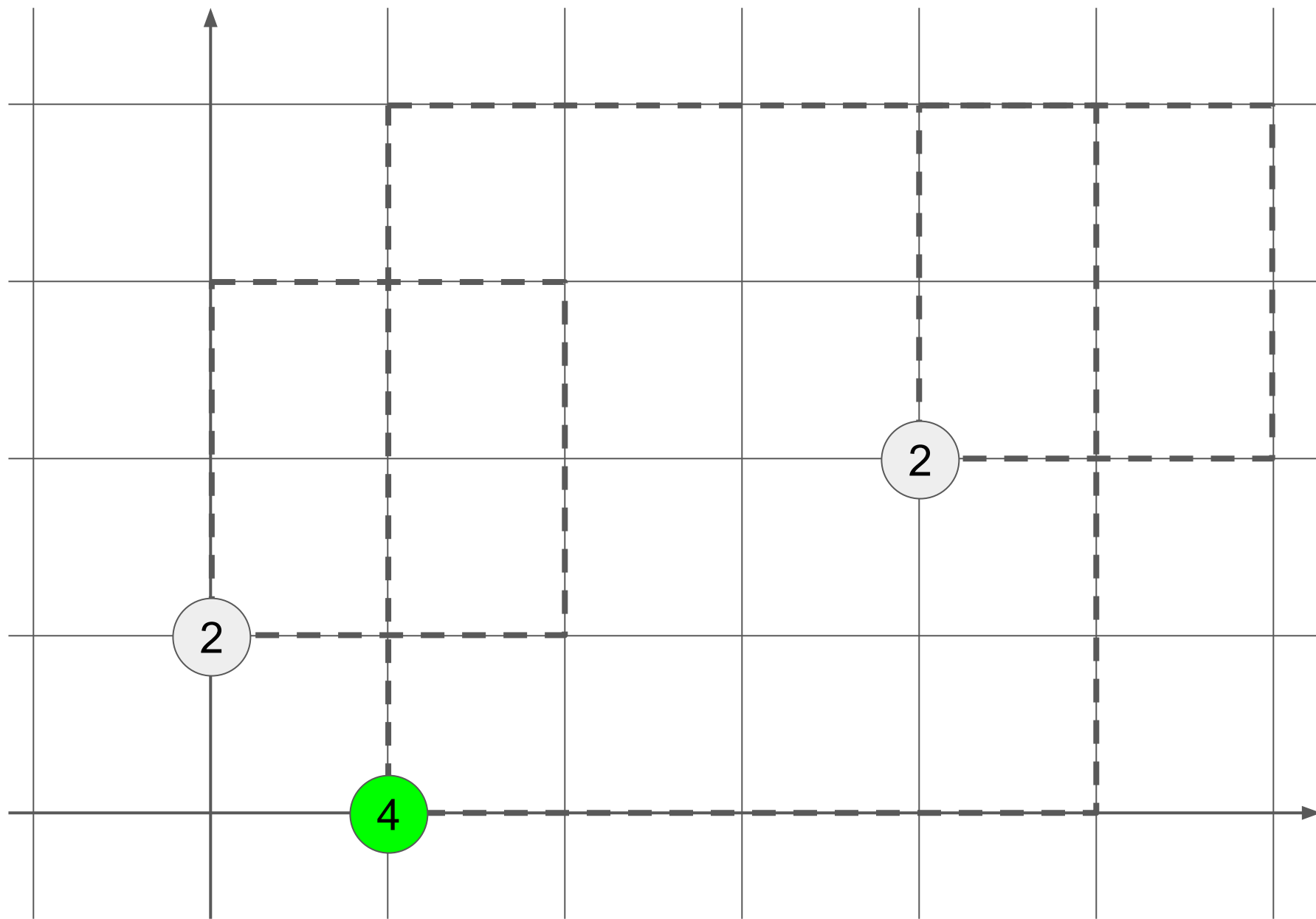
Key observation: The grid is small enough to iterate over each unit square and “paint it blue” in memory.

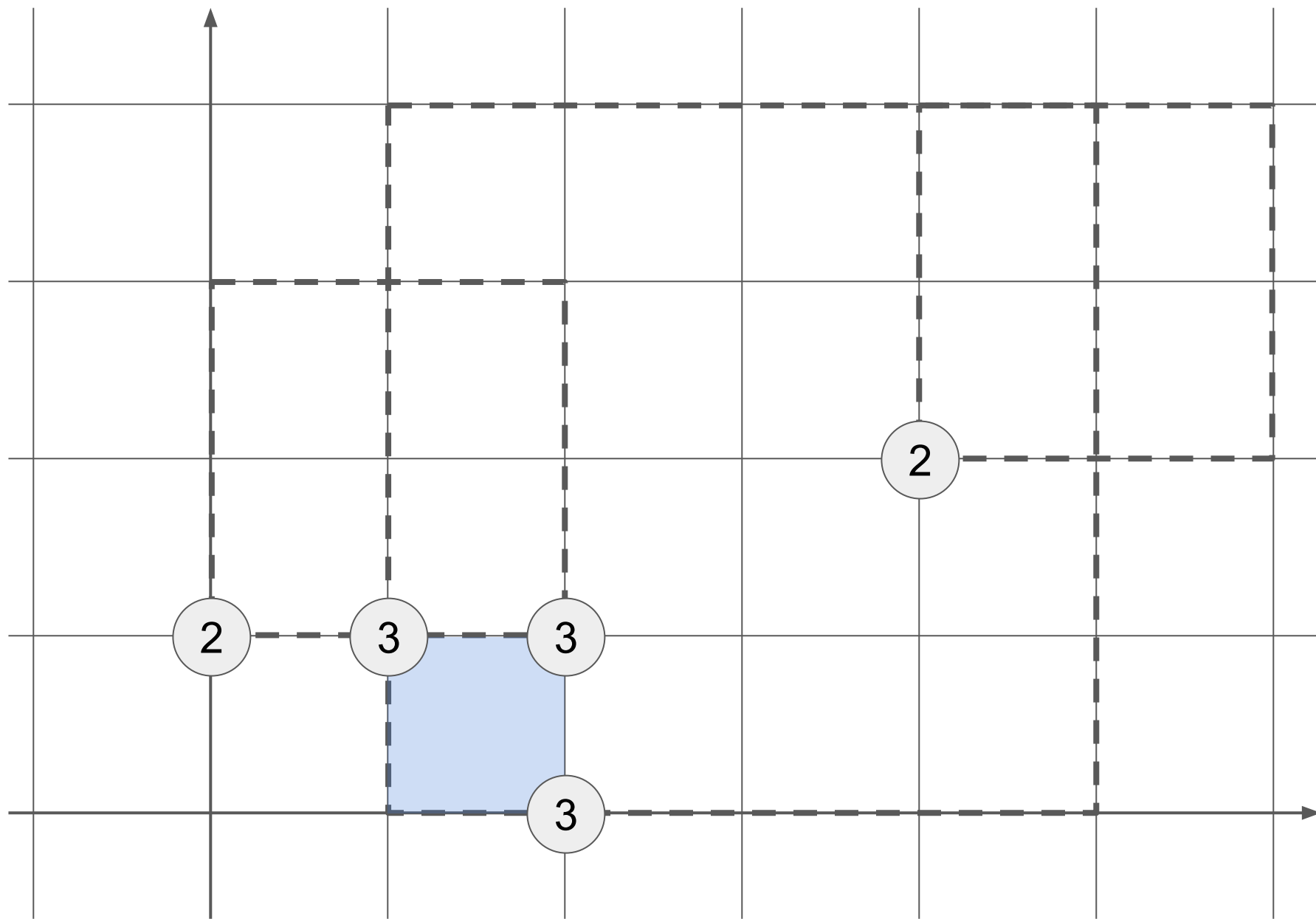
However, the naive algorithm that iterates through each unit square of each frame is too slow.

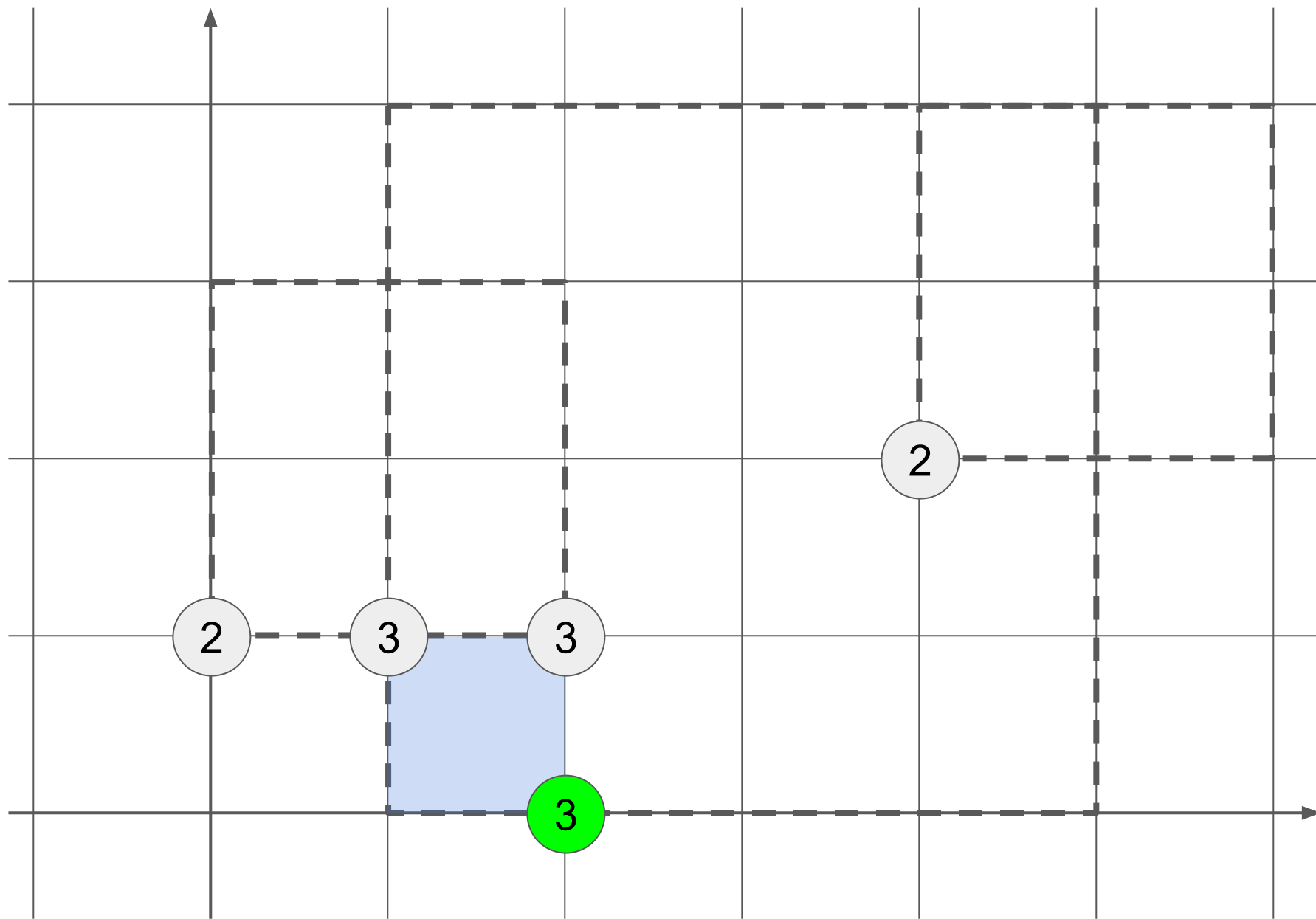
Instead, let's first place a “bucket full of paint” in a corner of each frame.

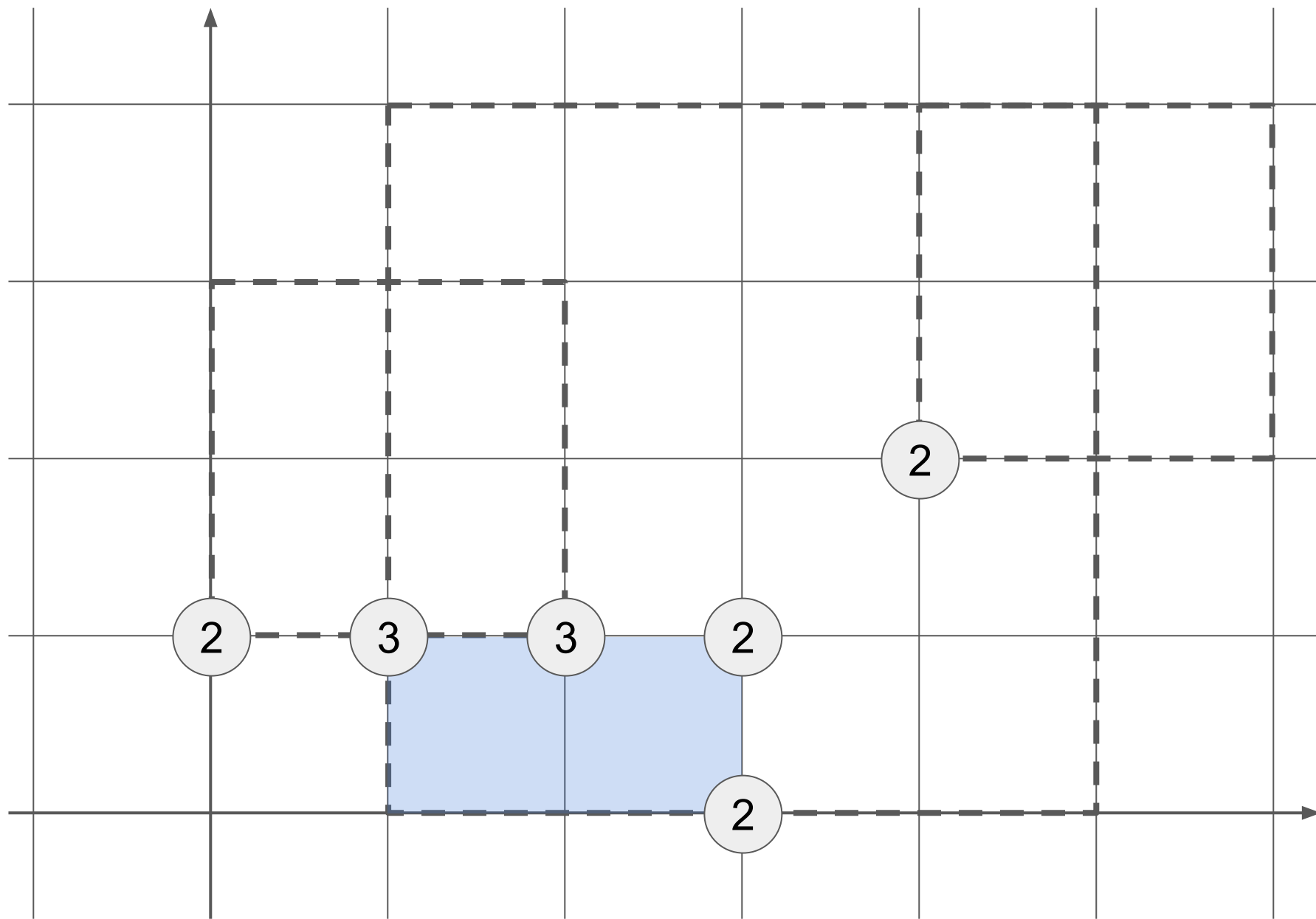
Then, we'll sweep across the grid and whenever we encounter a bucket, we'll paint one unit square and propagate the bucket to neighbouring squares.



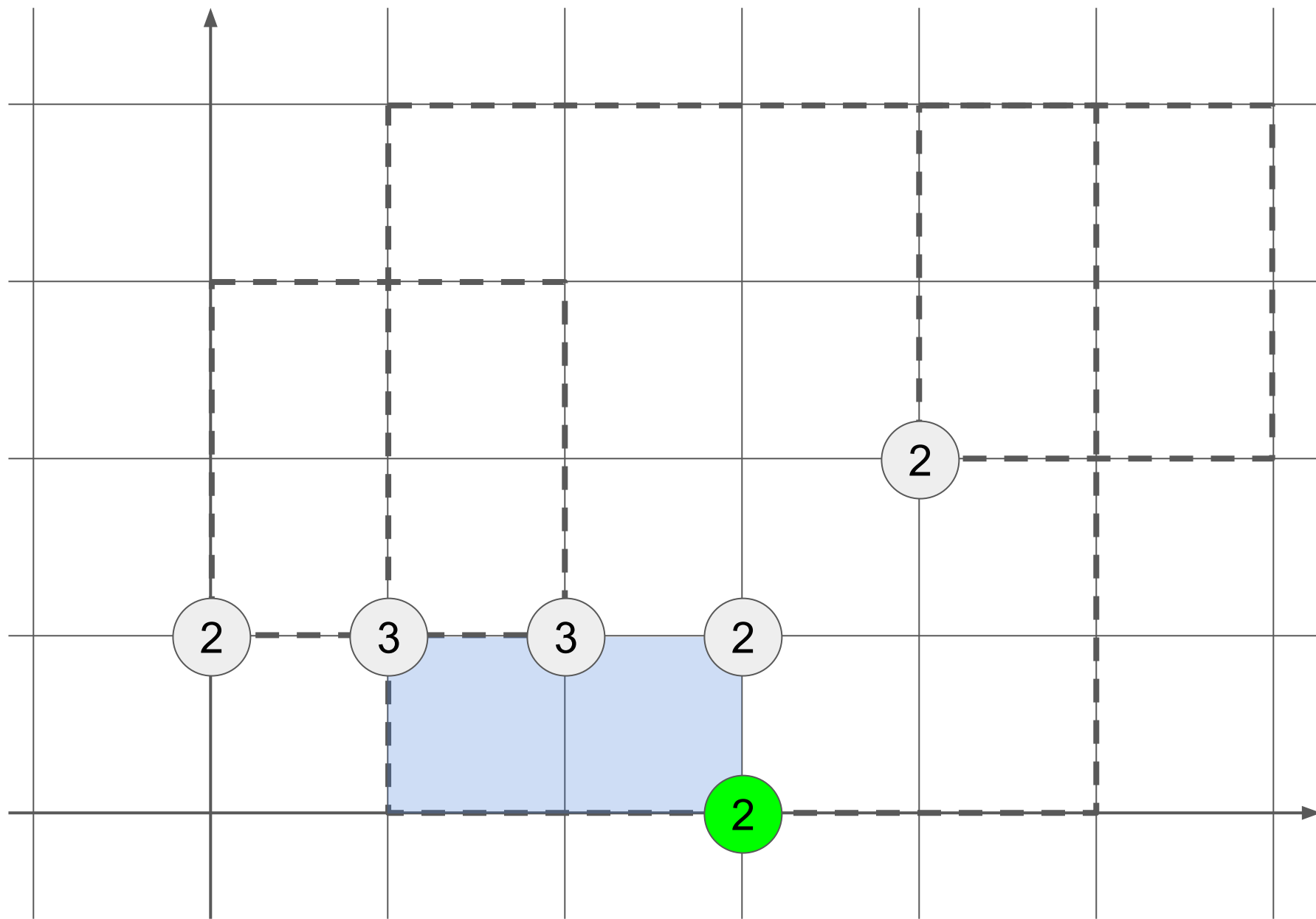


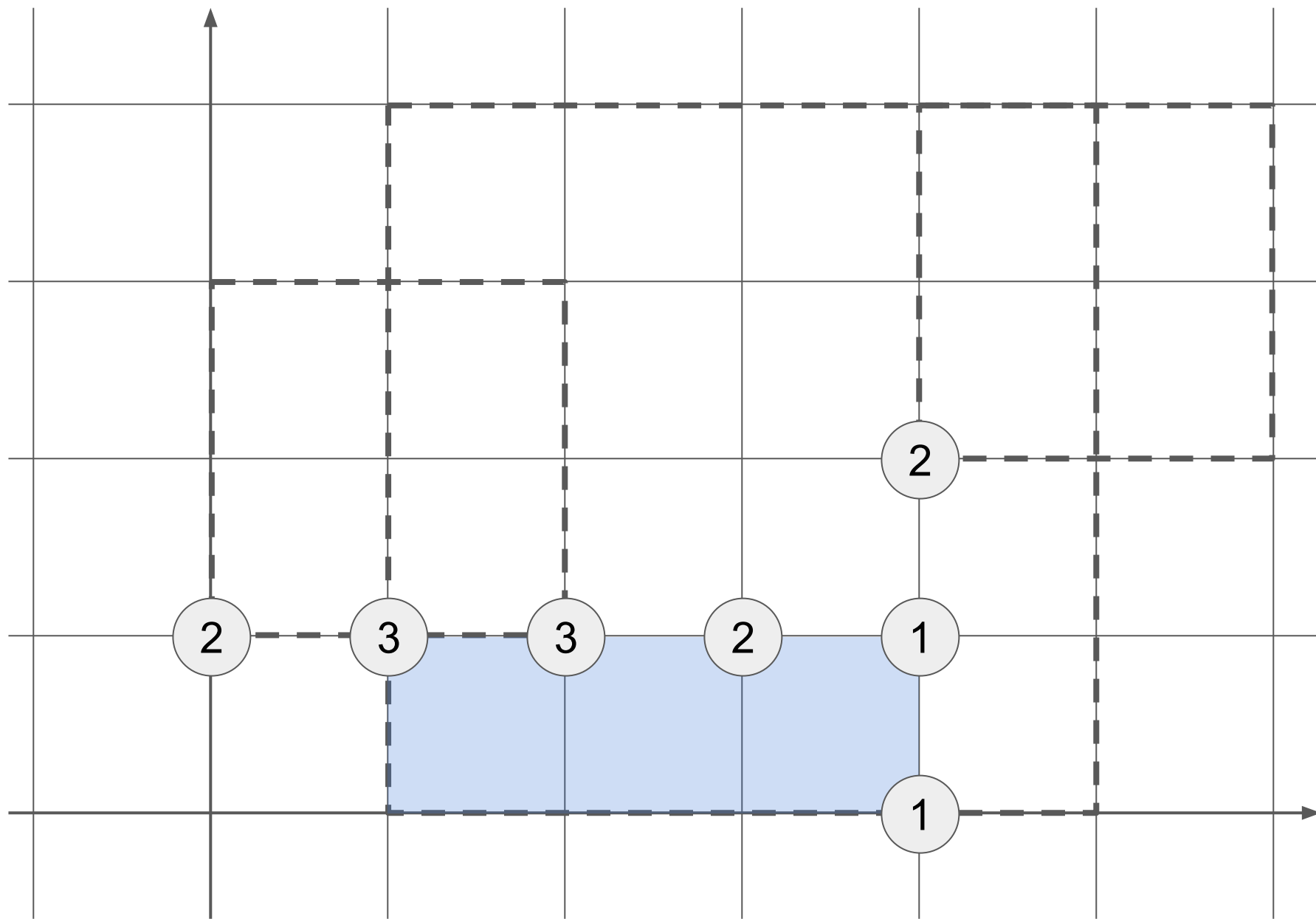


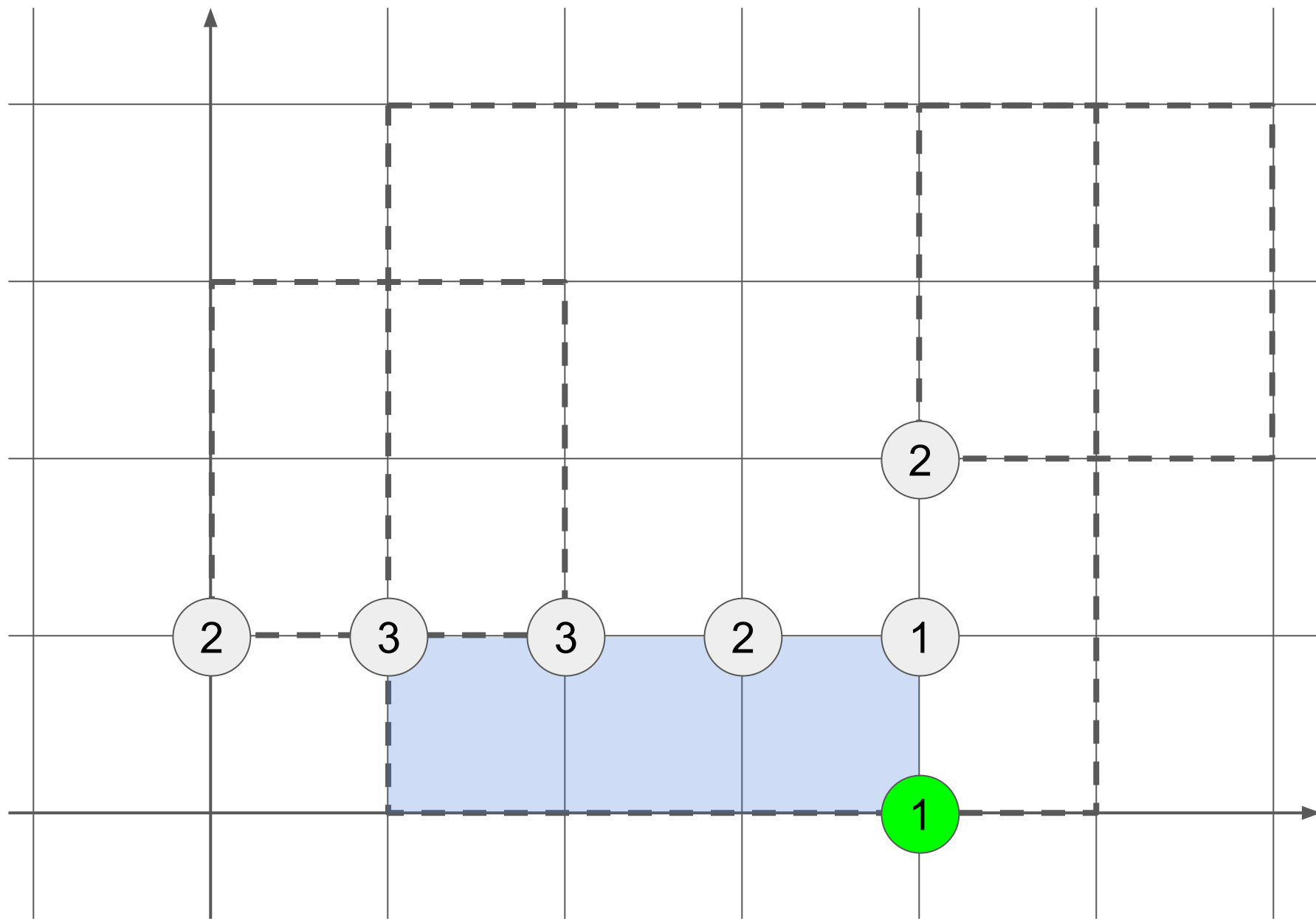


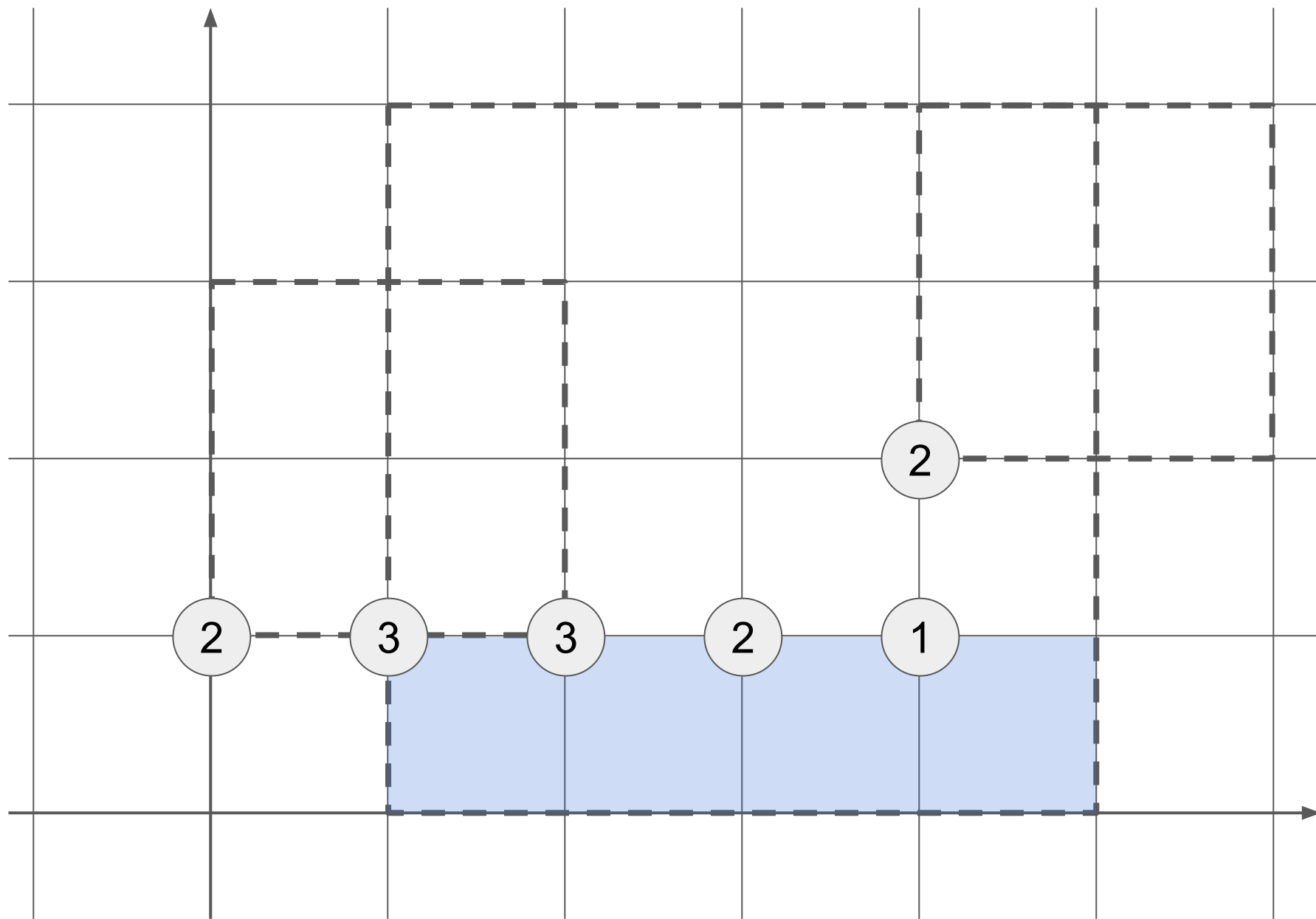


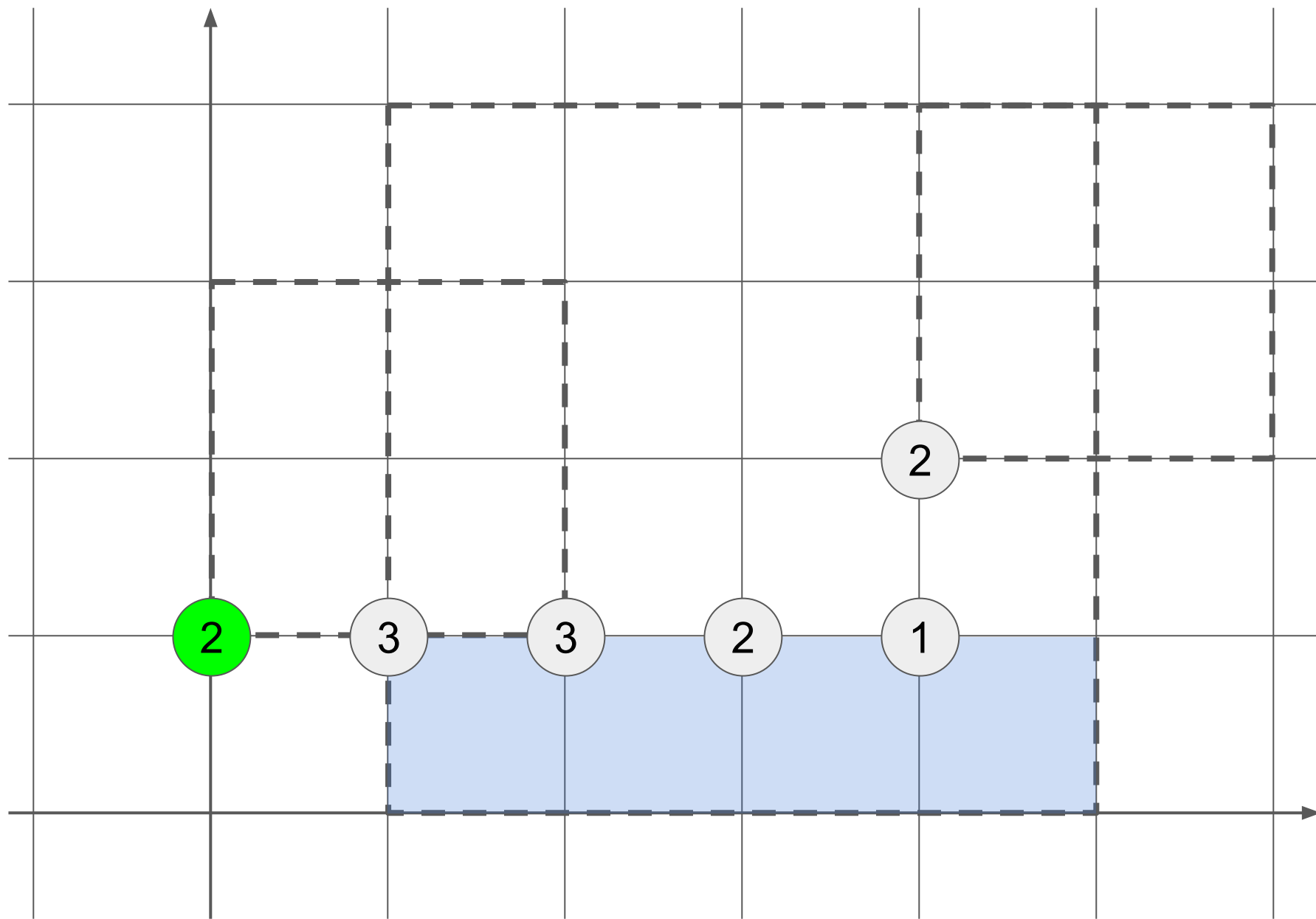


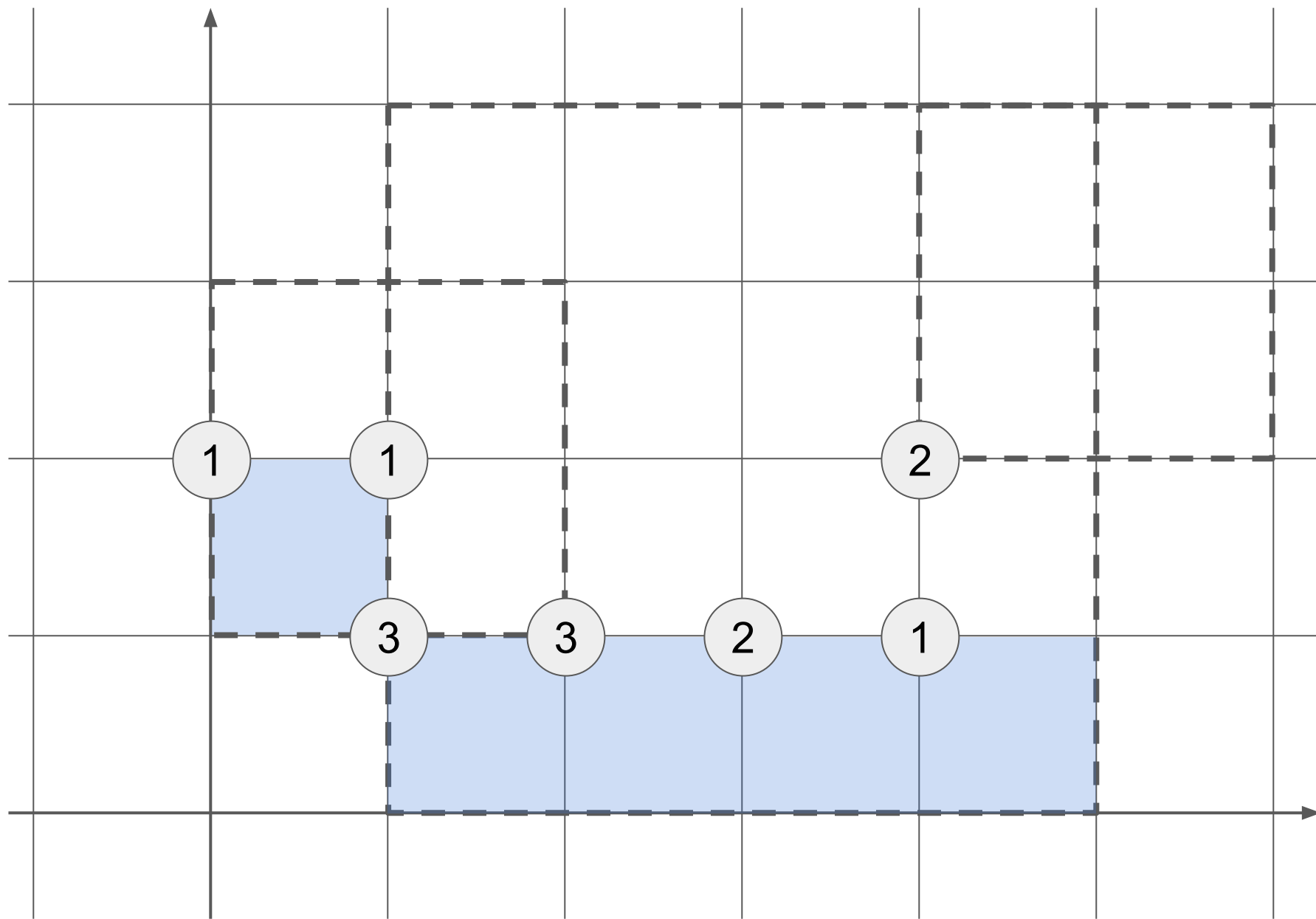


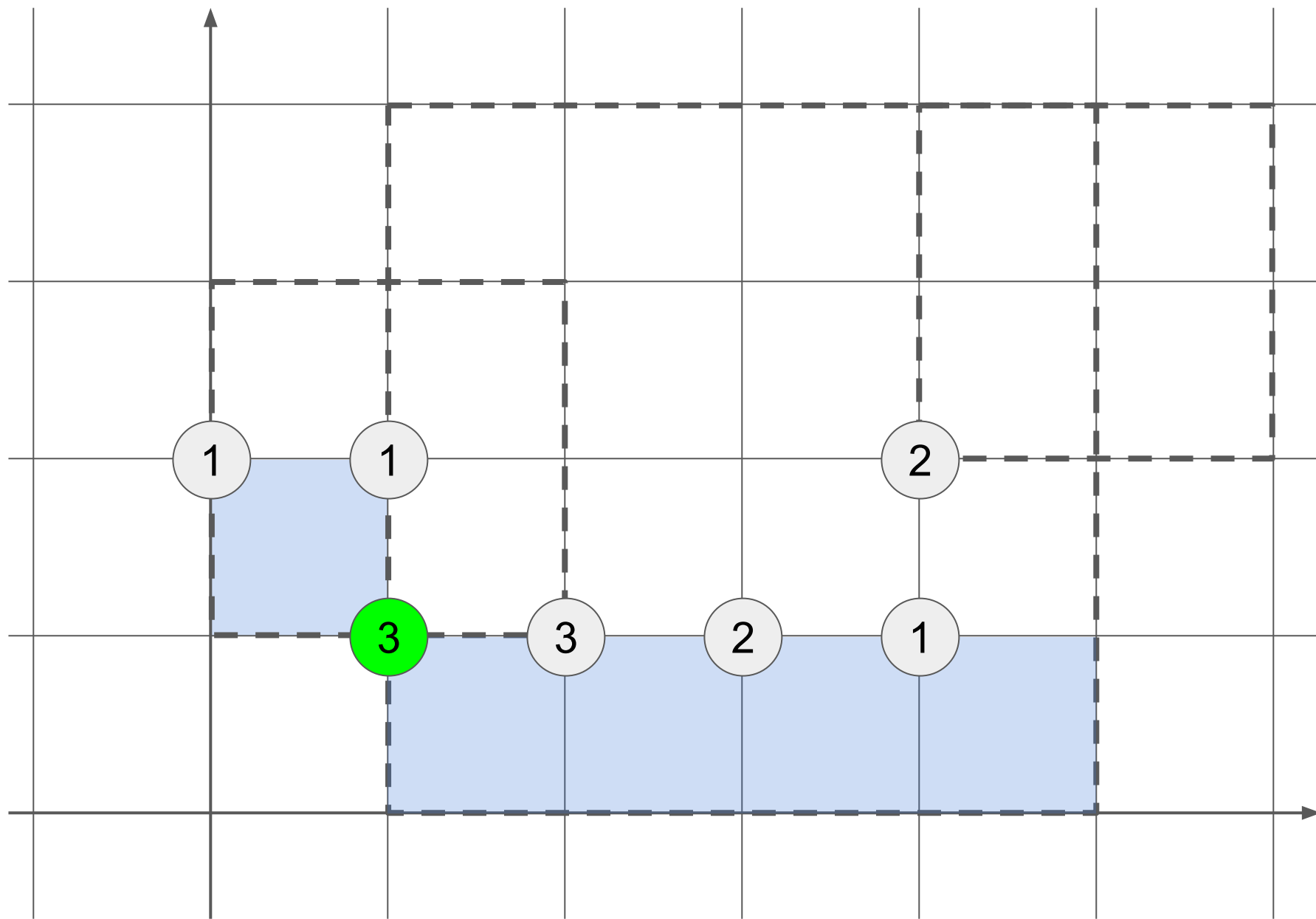


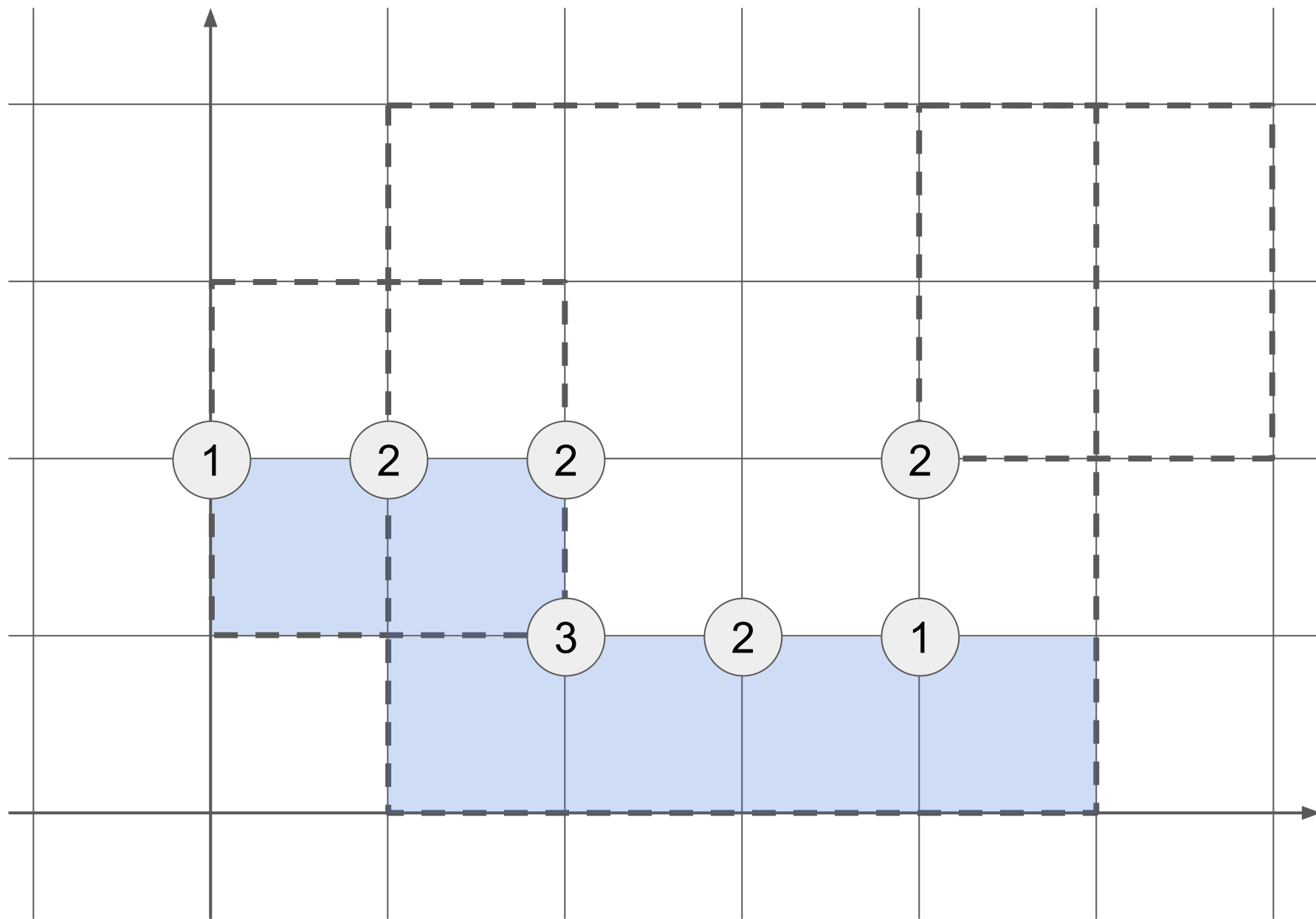




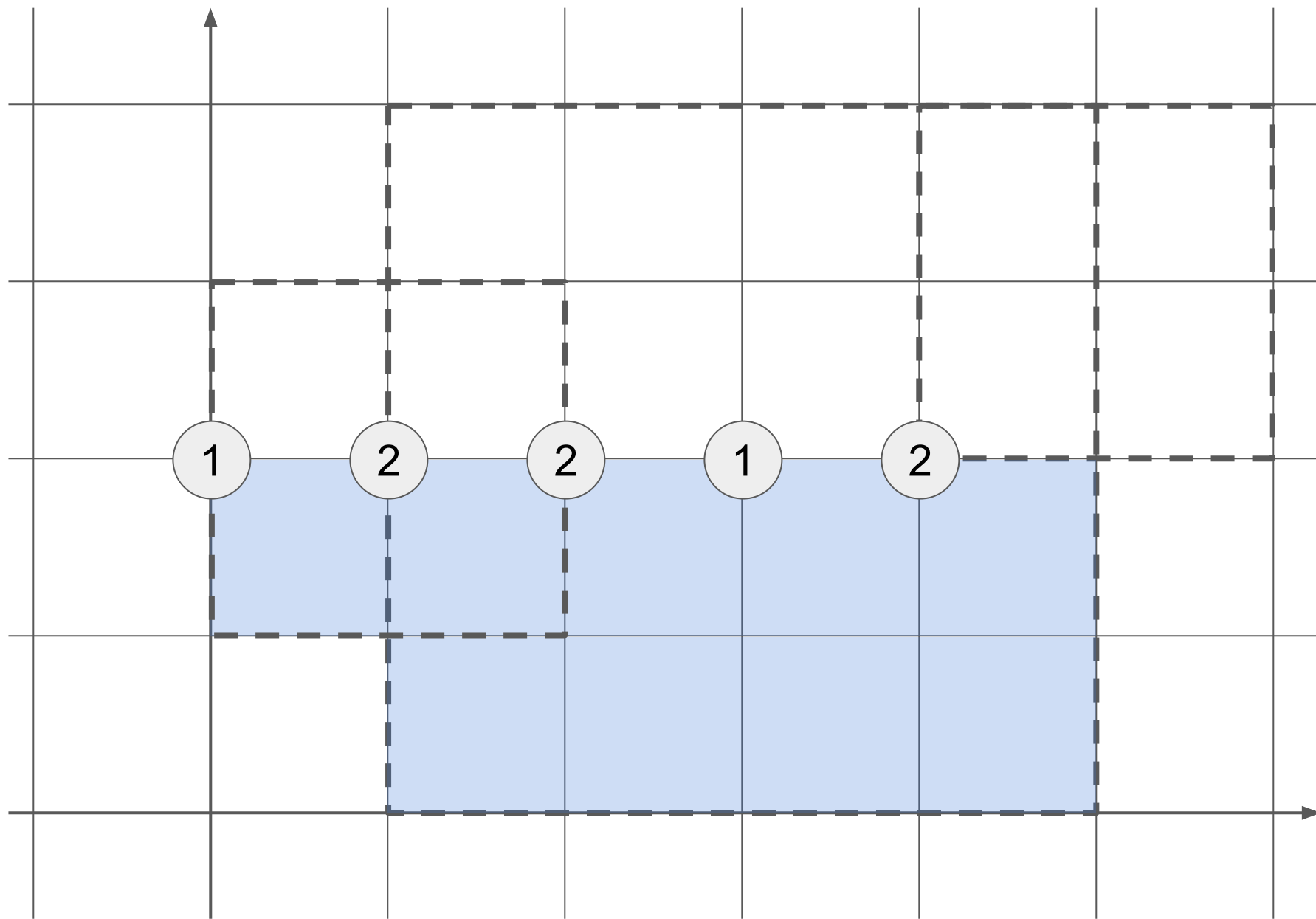


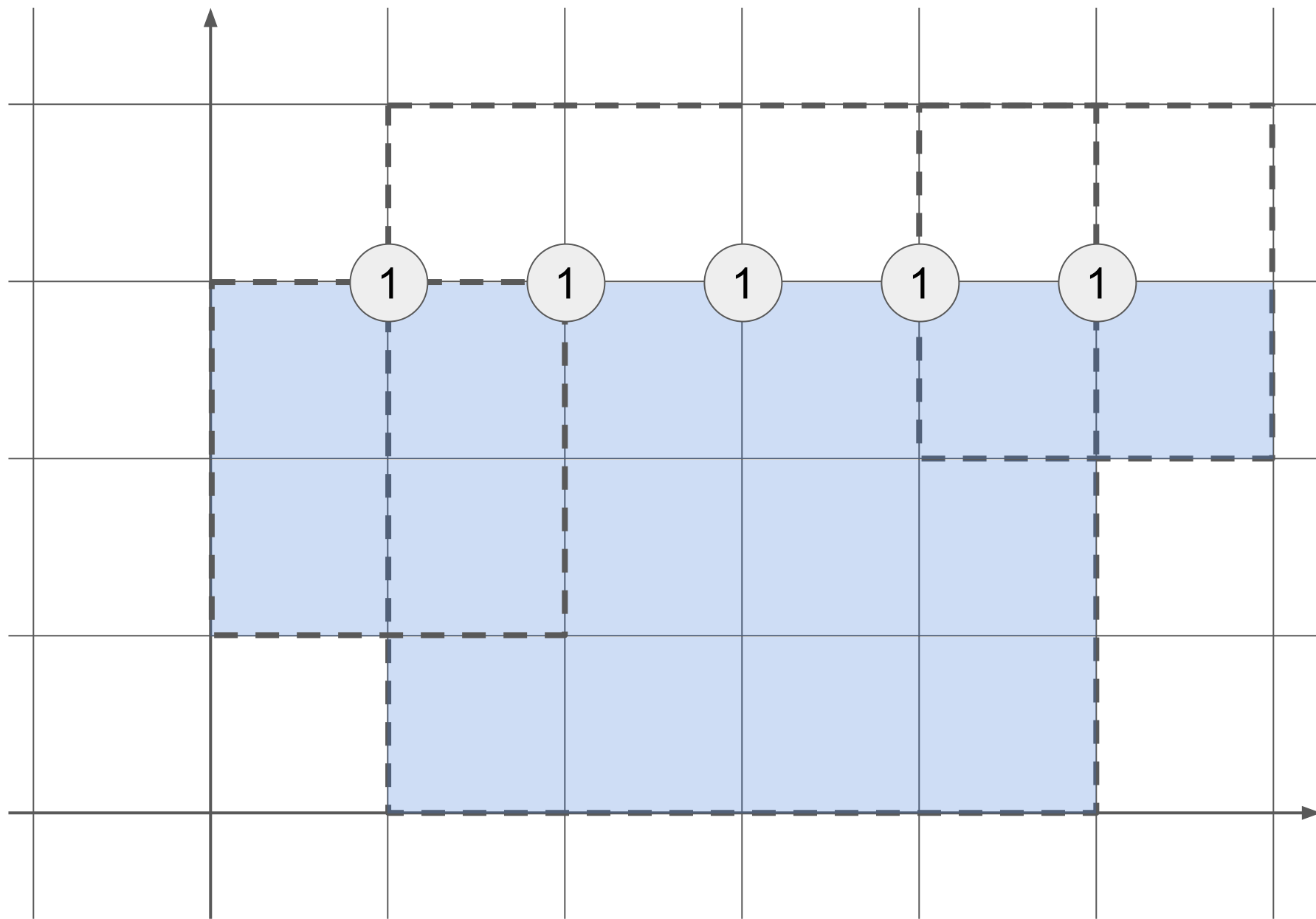


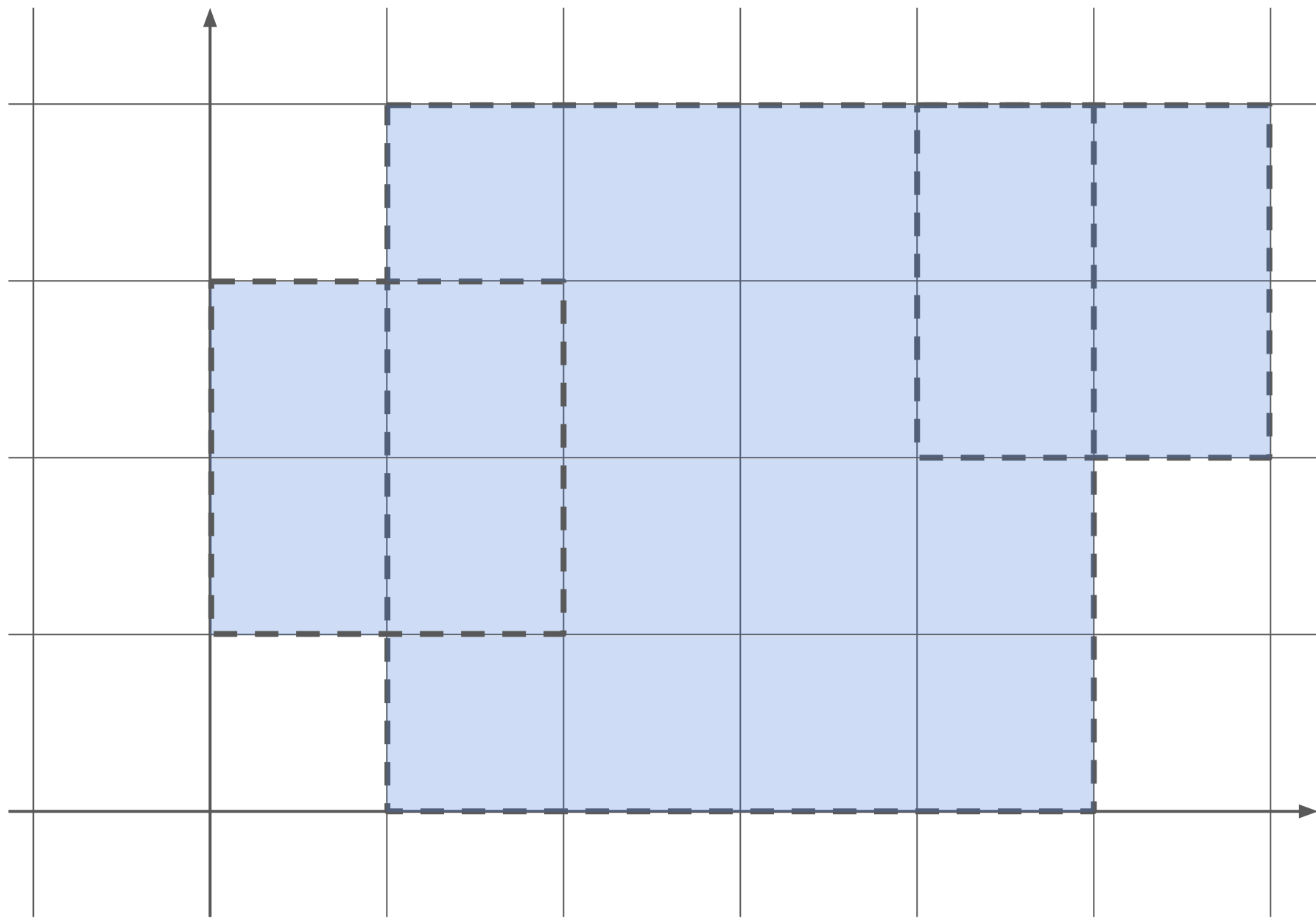


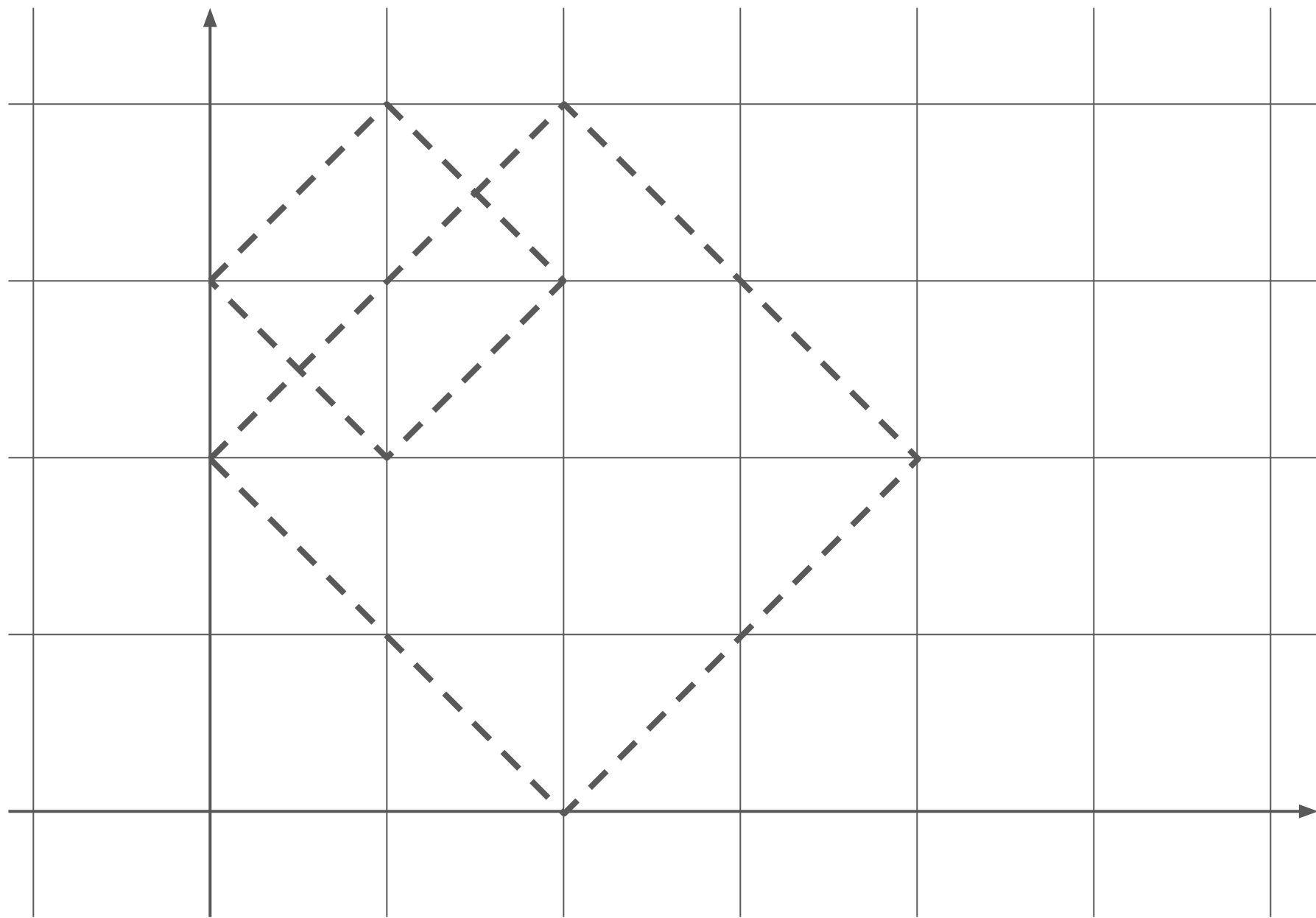


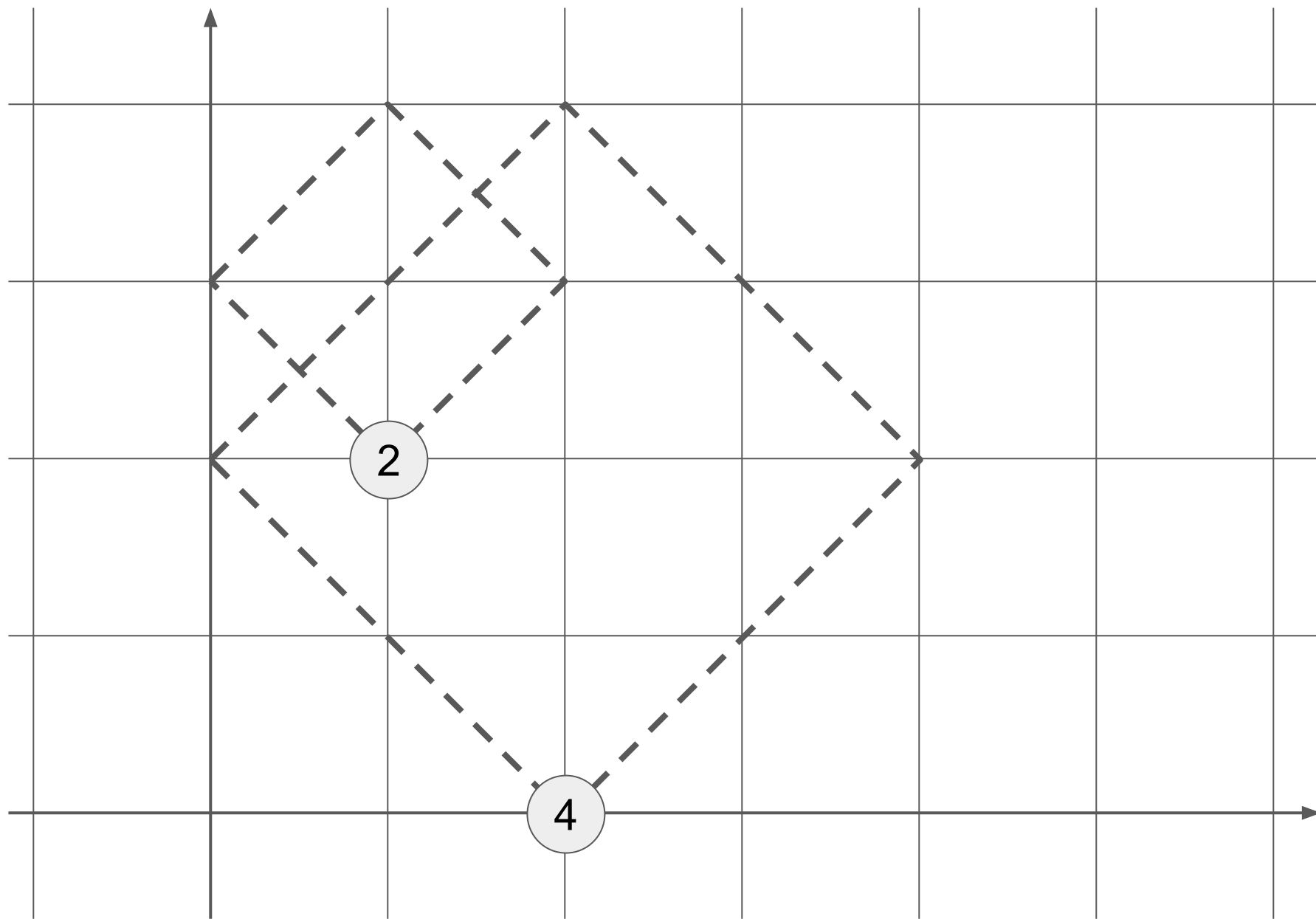


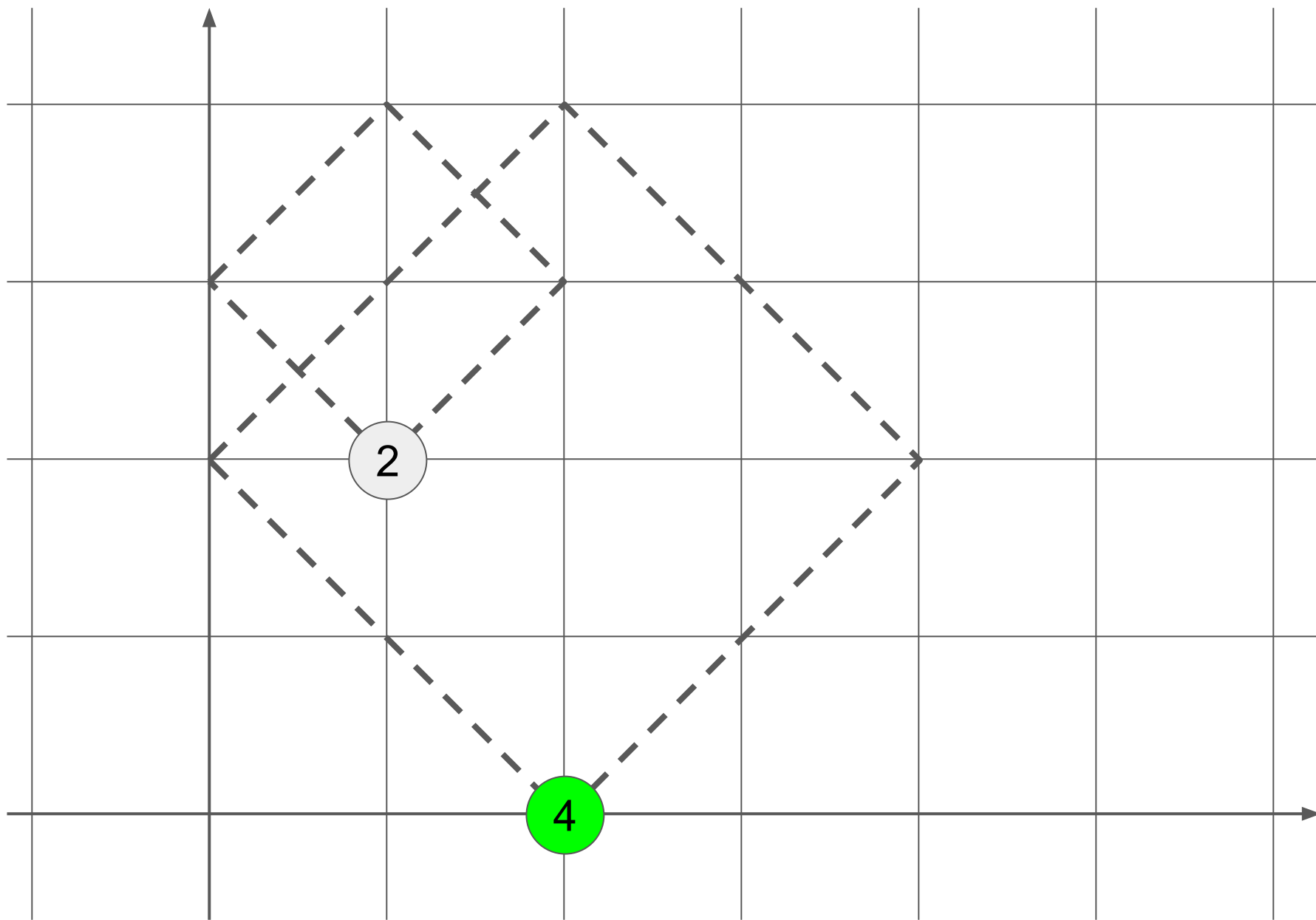


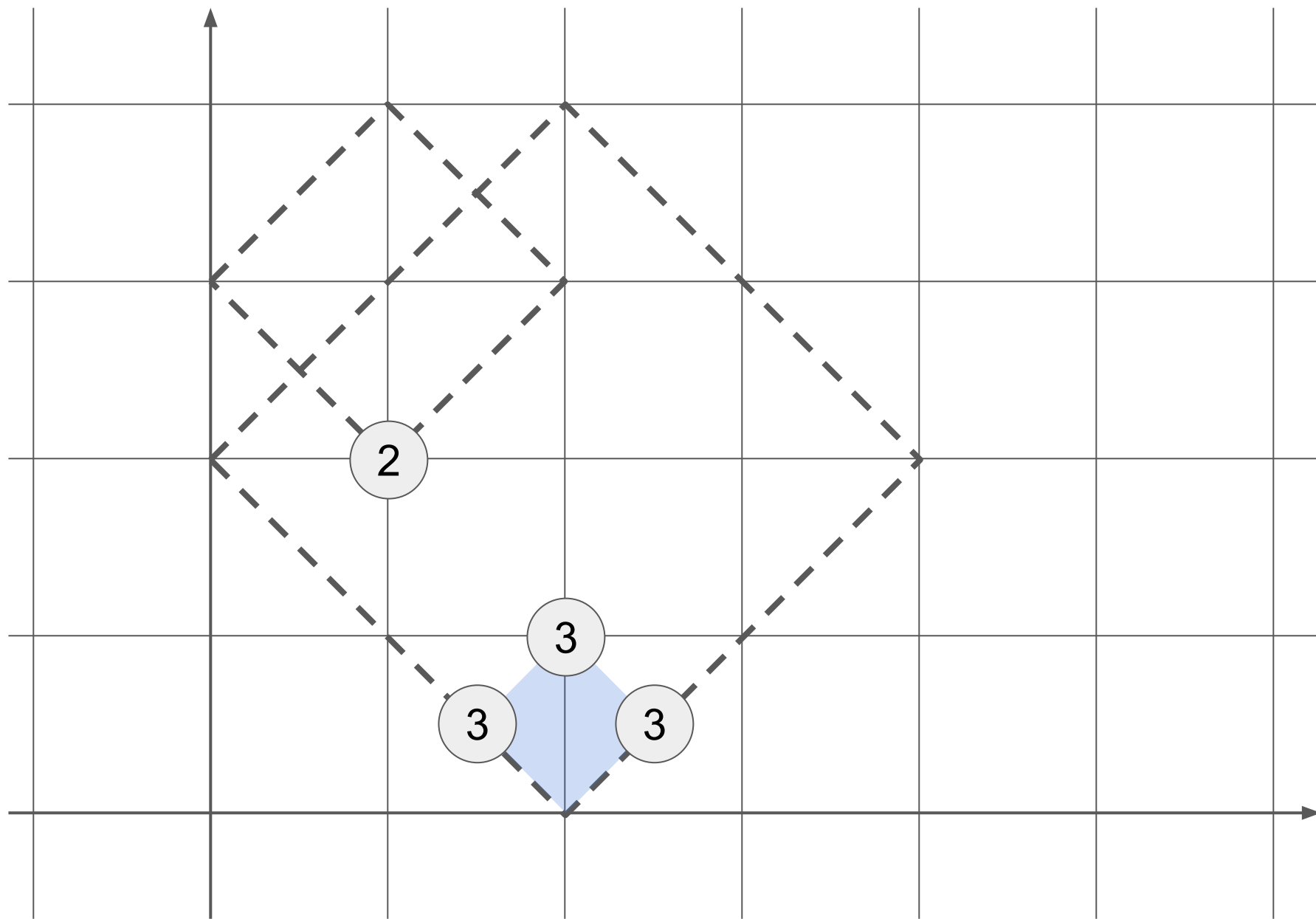


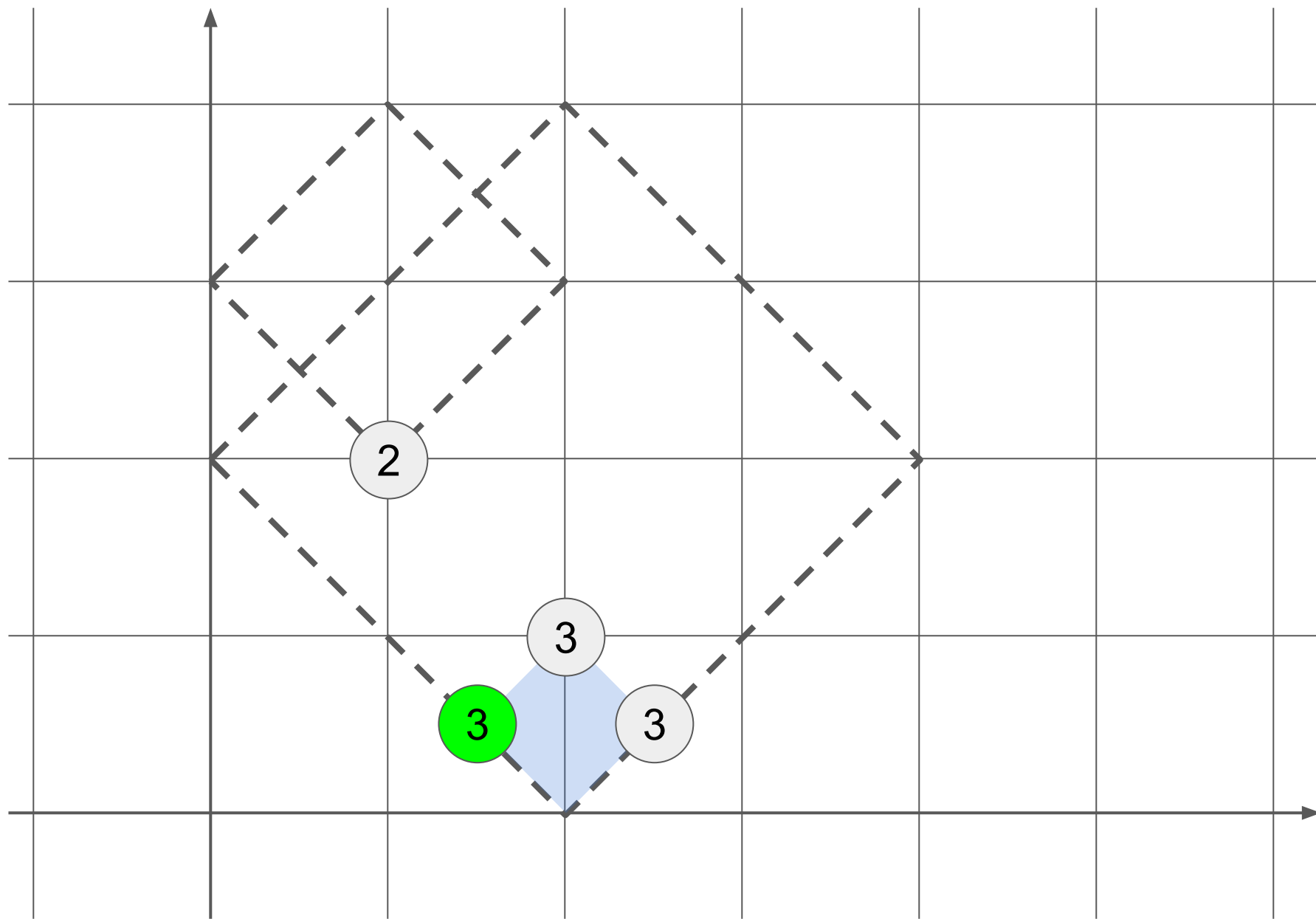




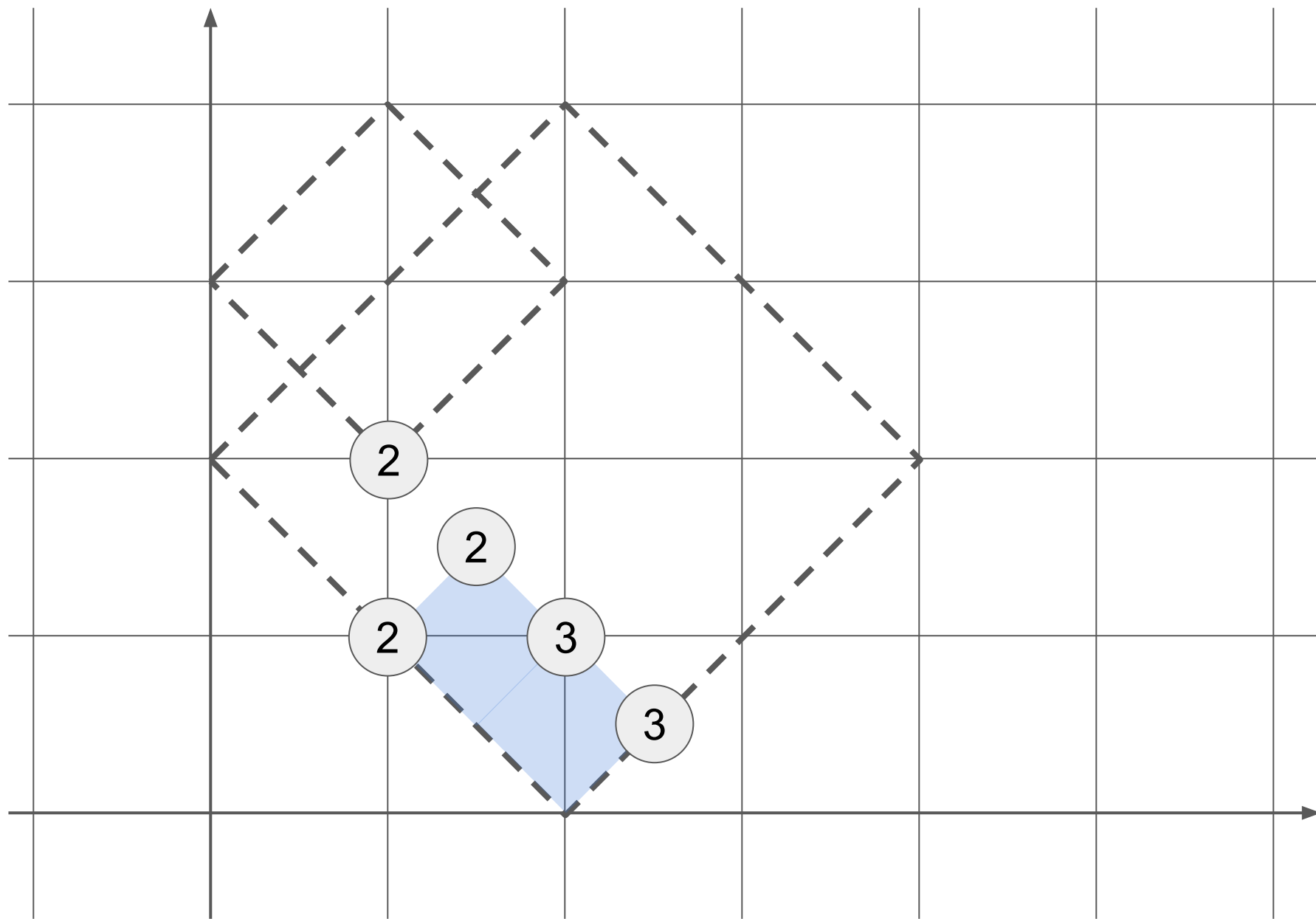


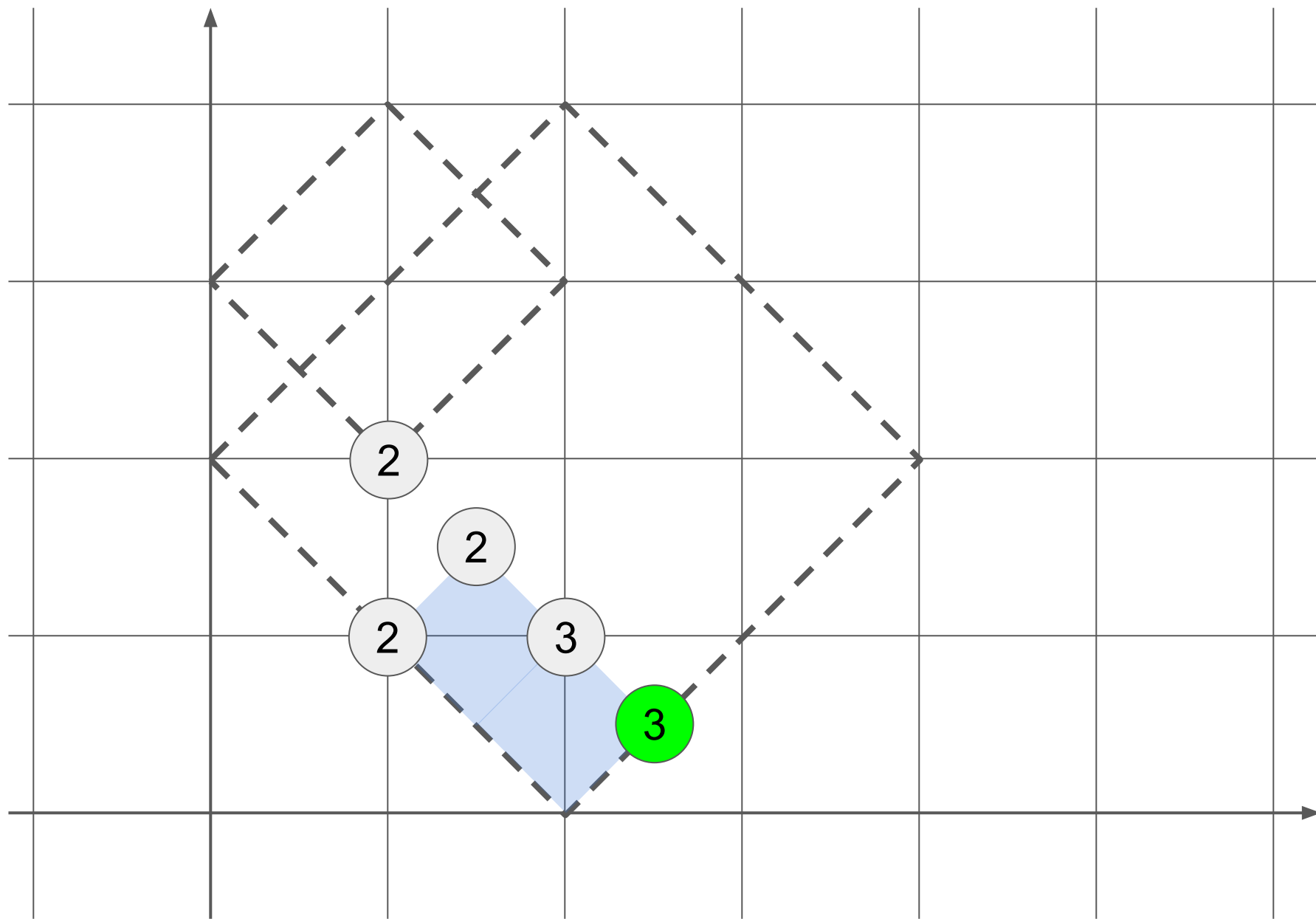


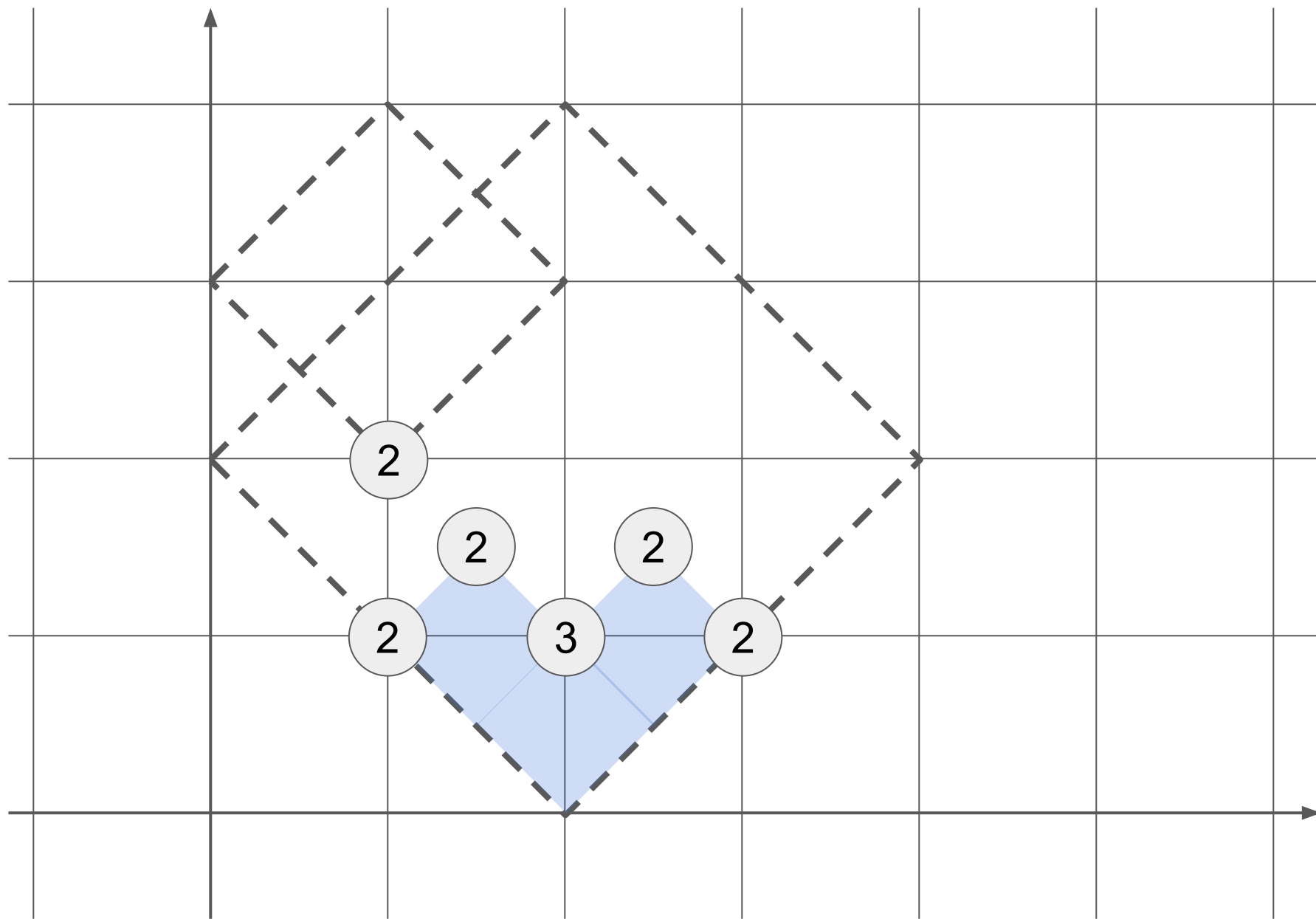


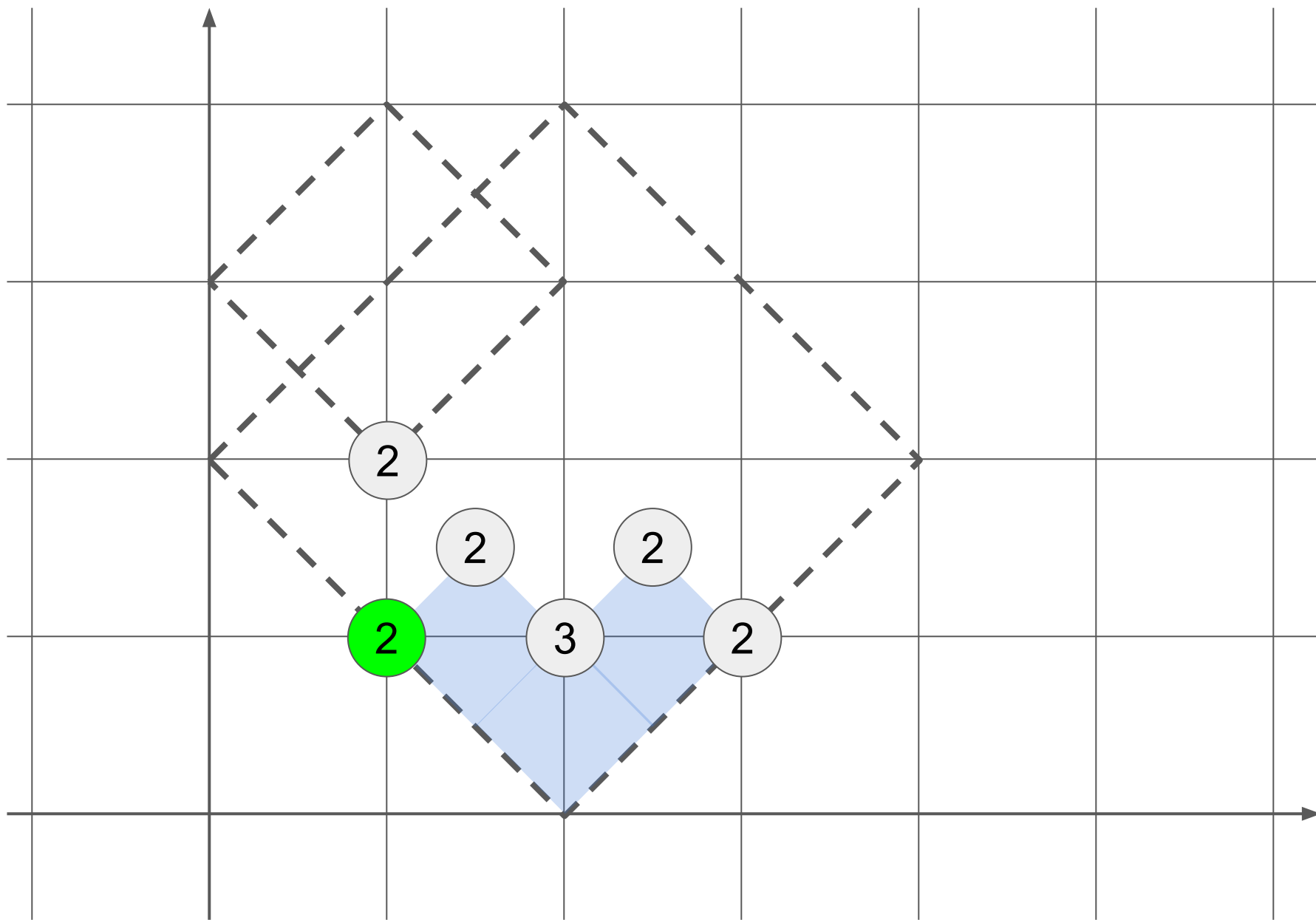


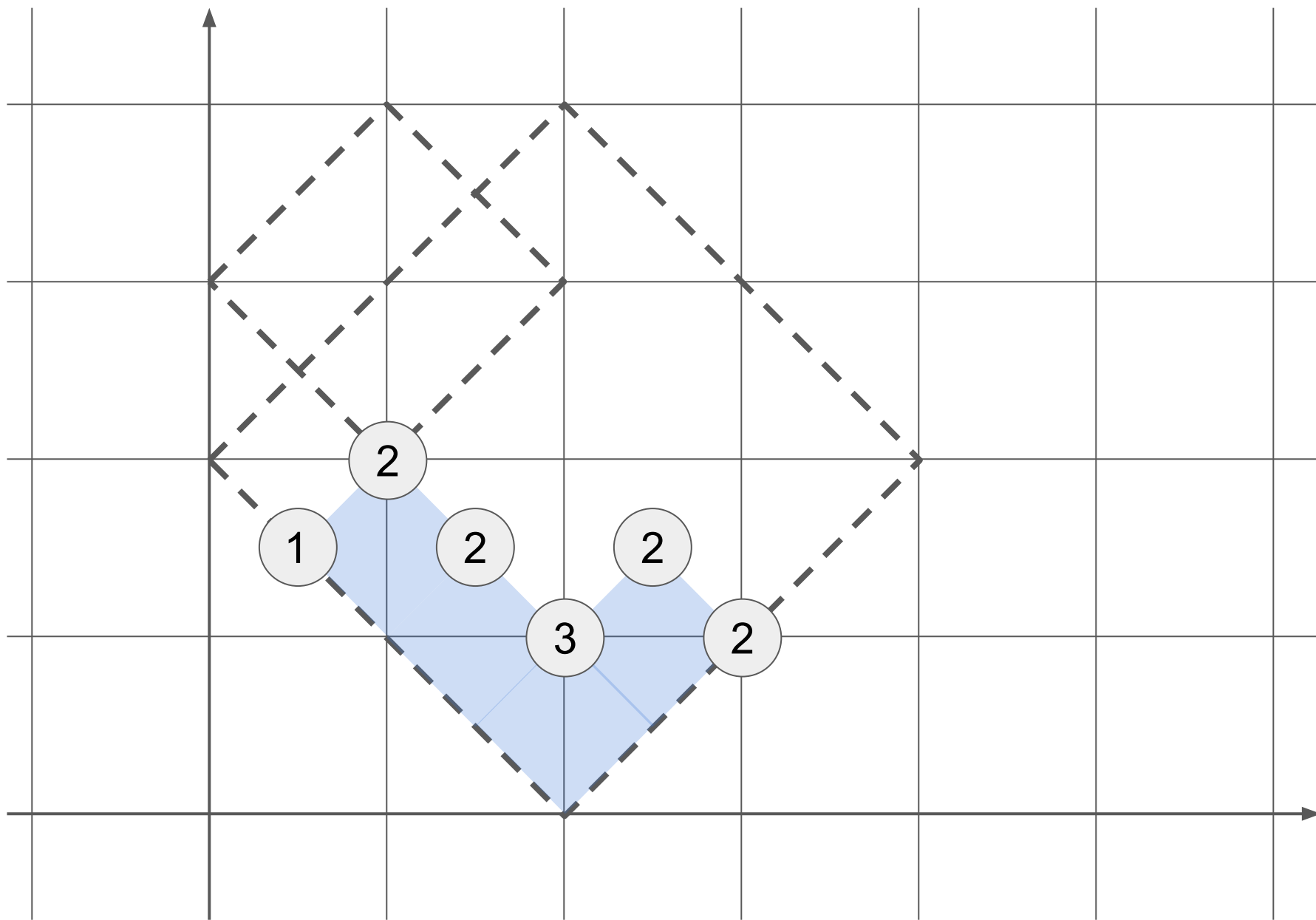


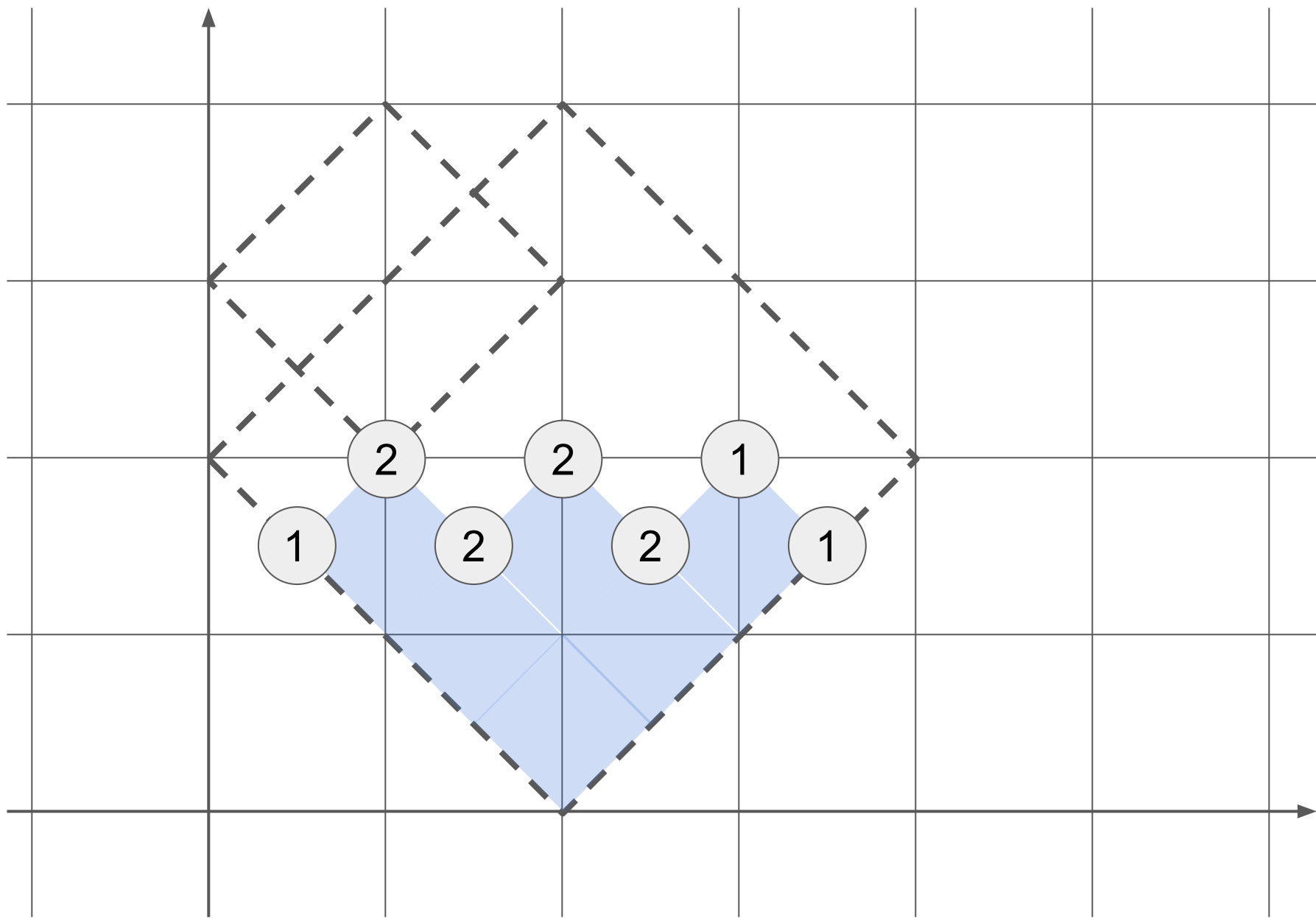


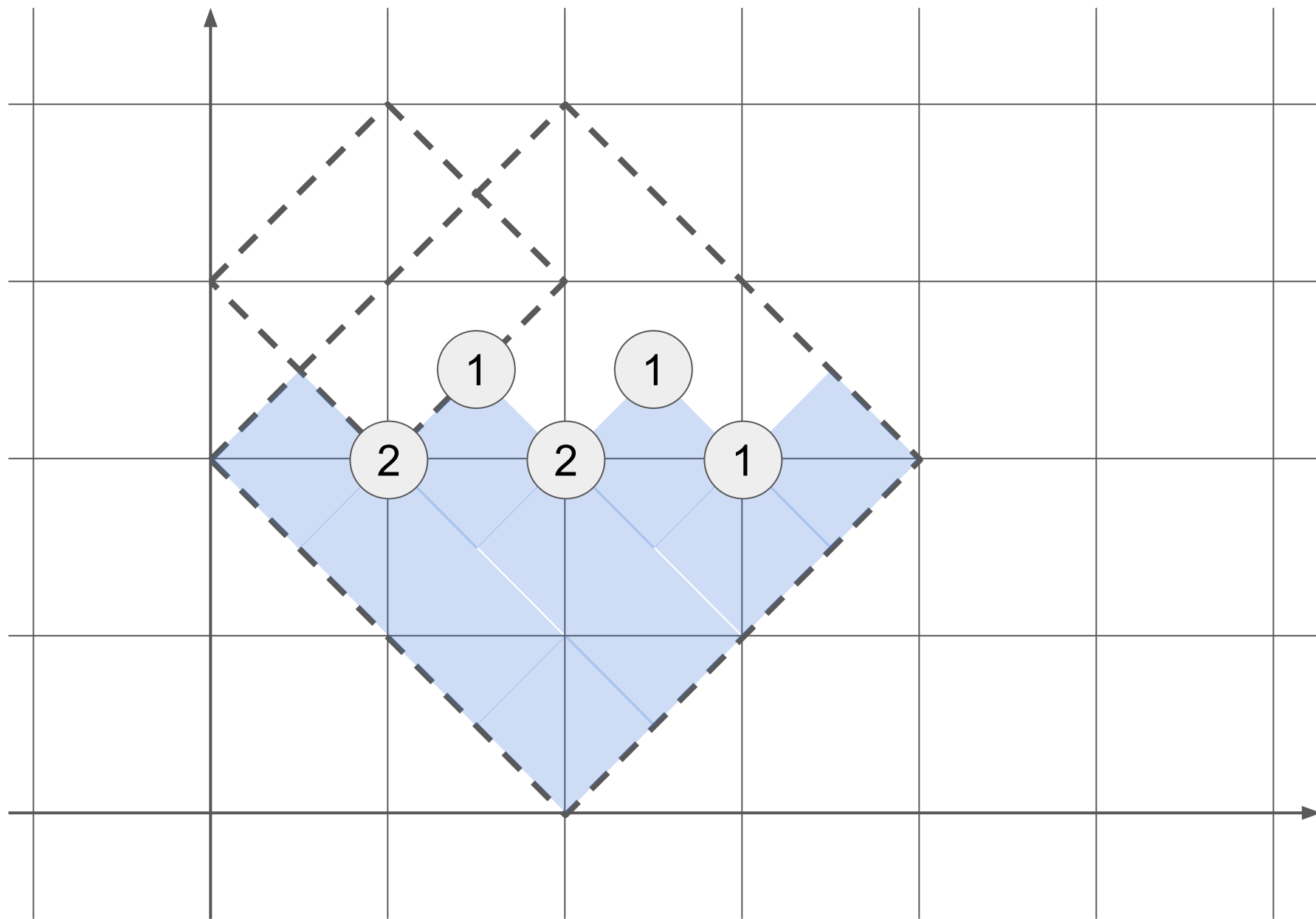


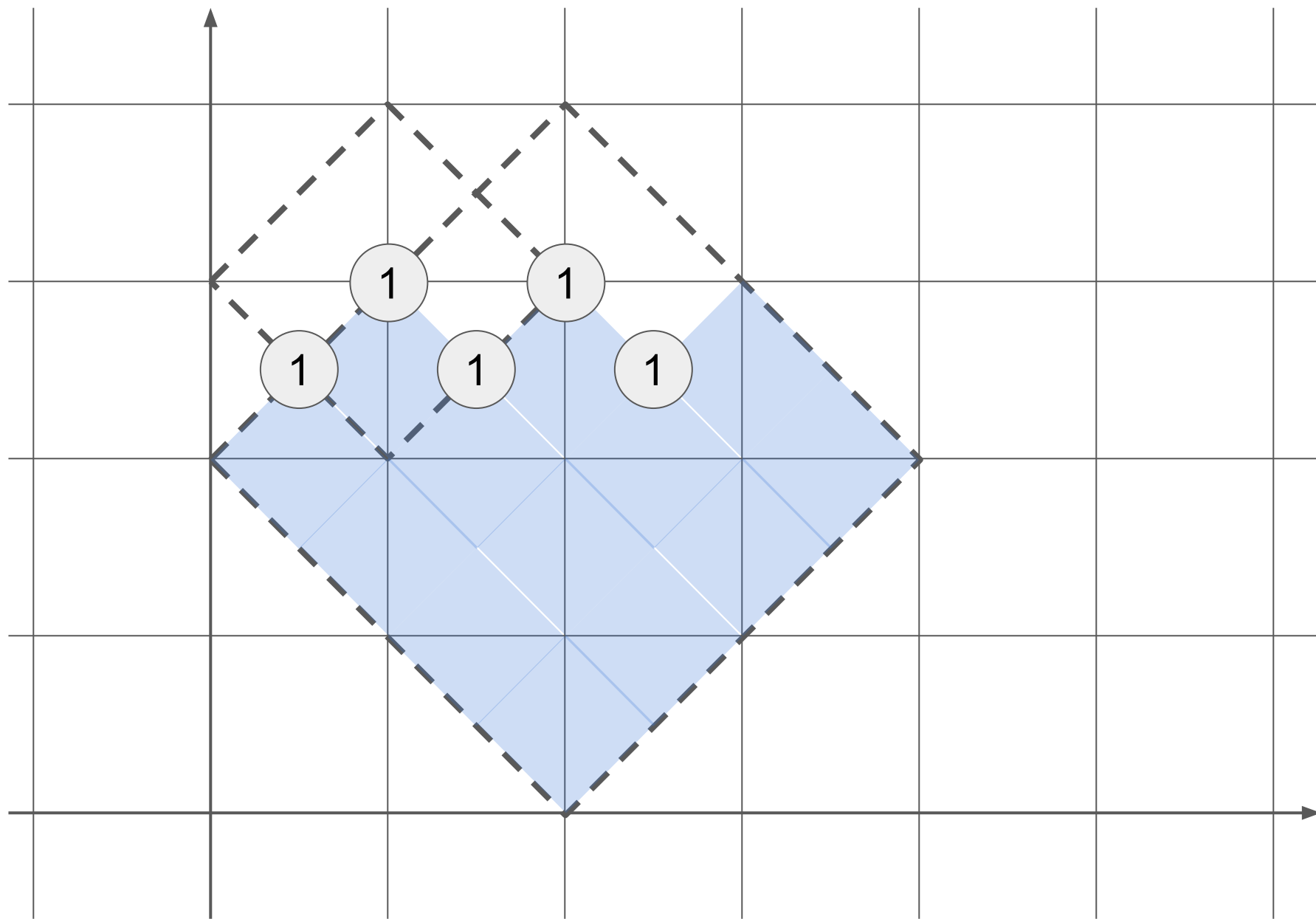




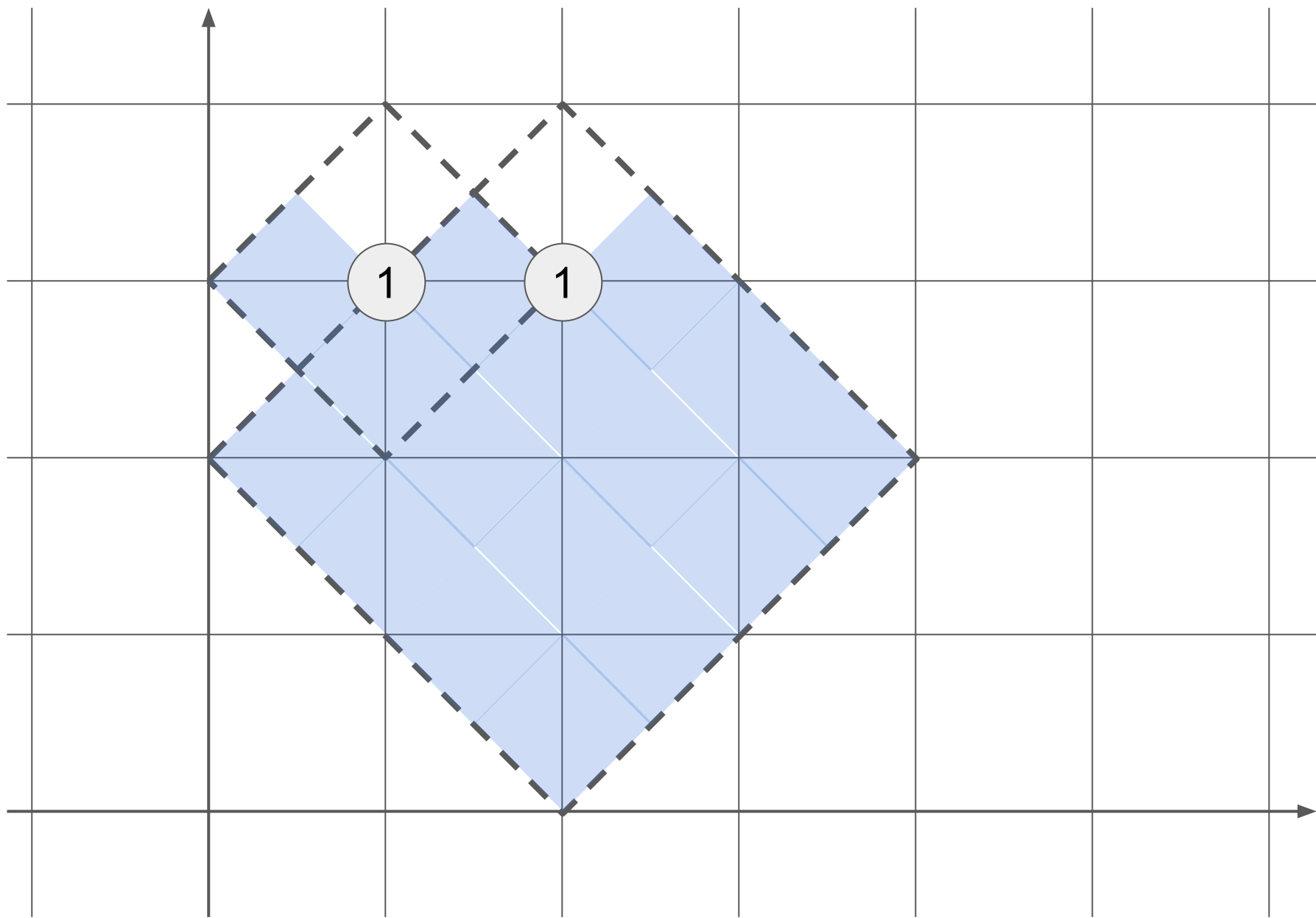


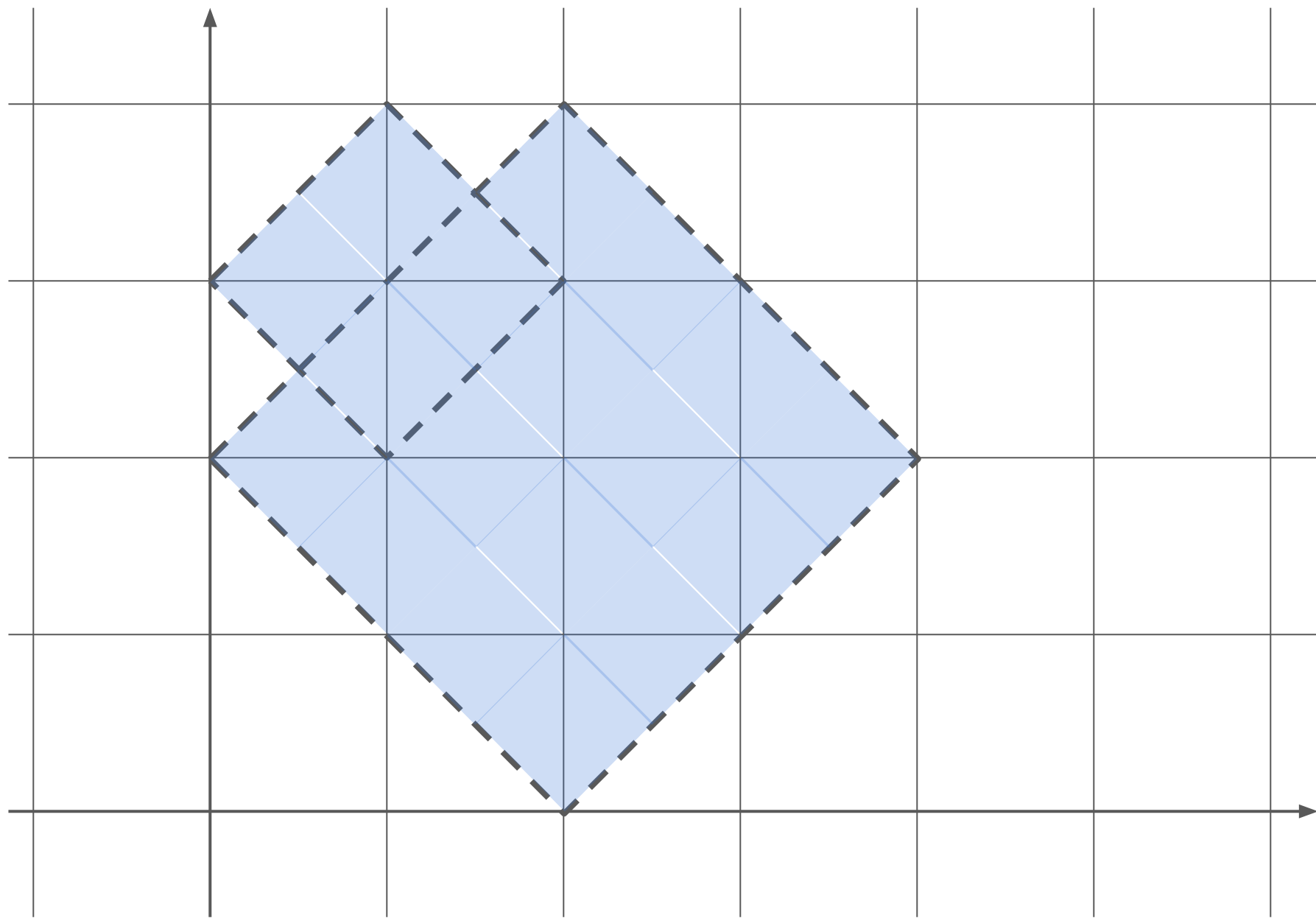


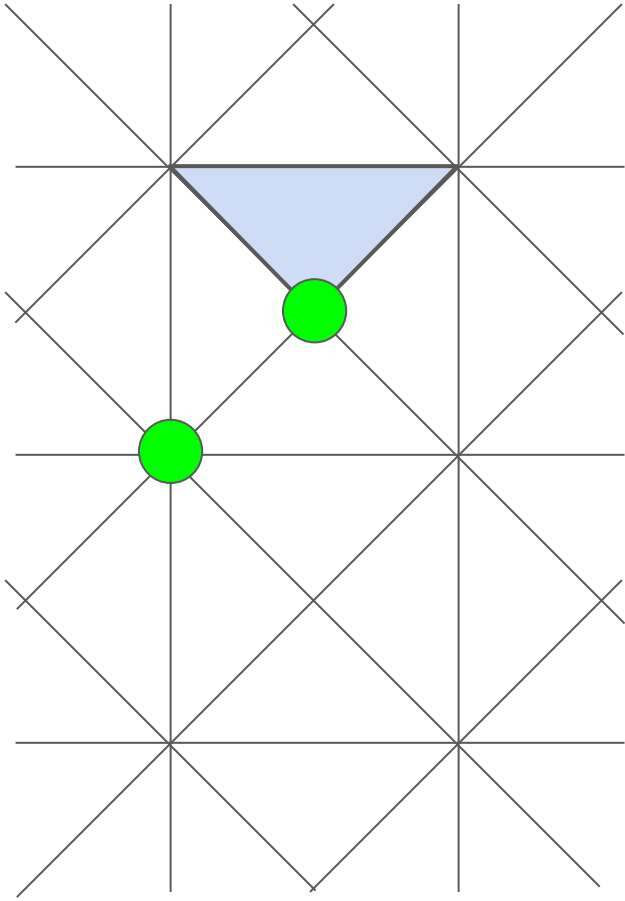






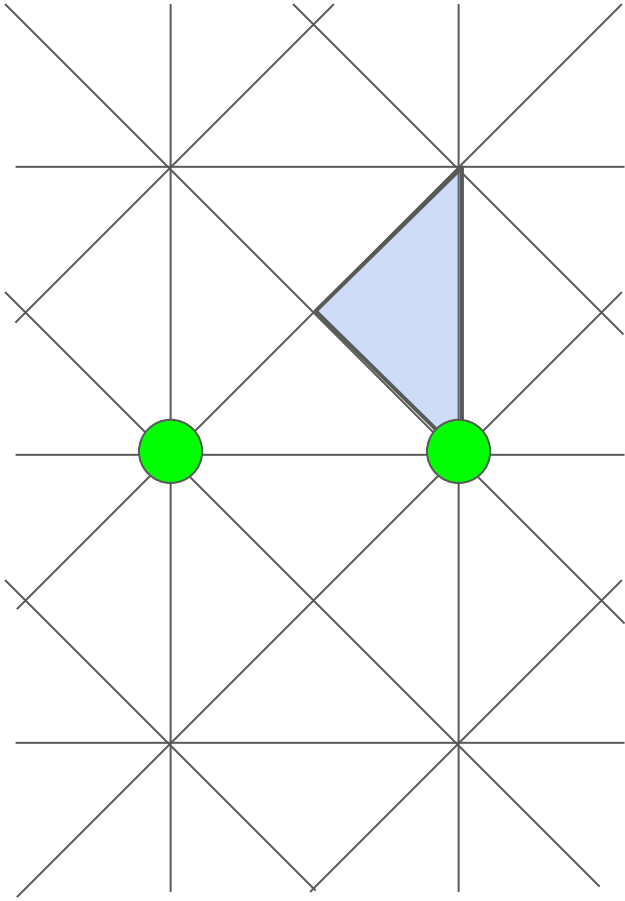






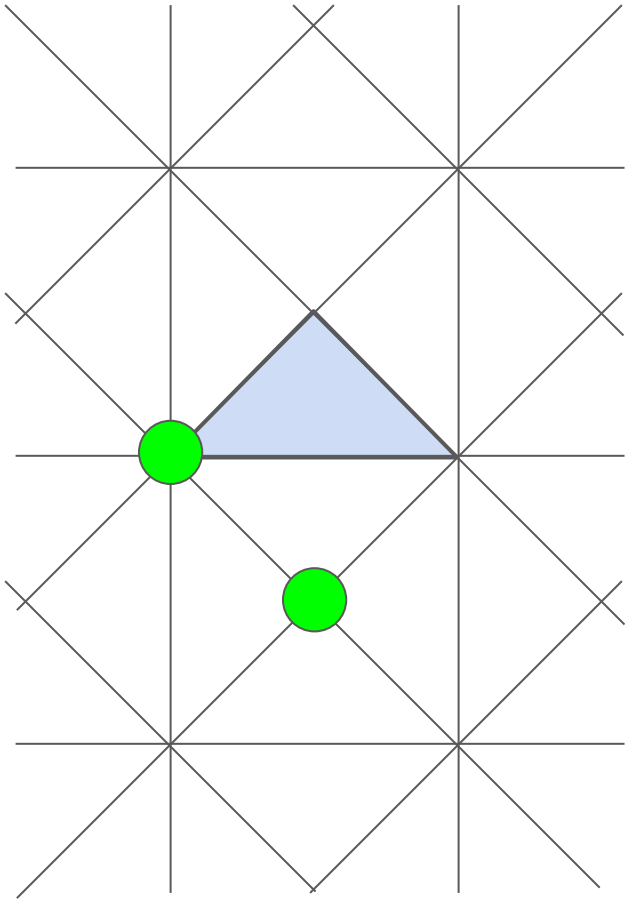
For each triangle we can deduce whether it was painted or not.

We need to check whether we ever had a type A bucket of paint in the lower left corner of the unit square or a type B bucket in the right position (depending on the triangle type).



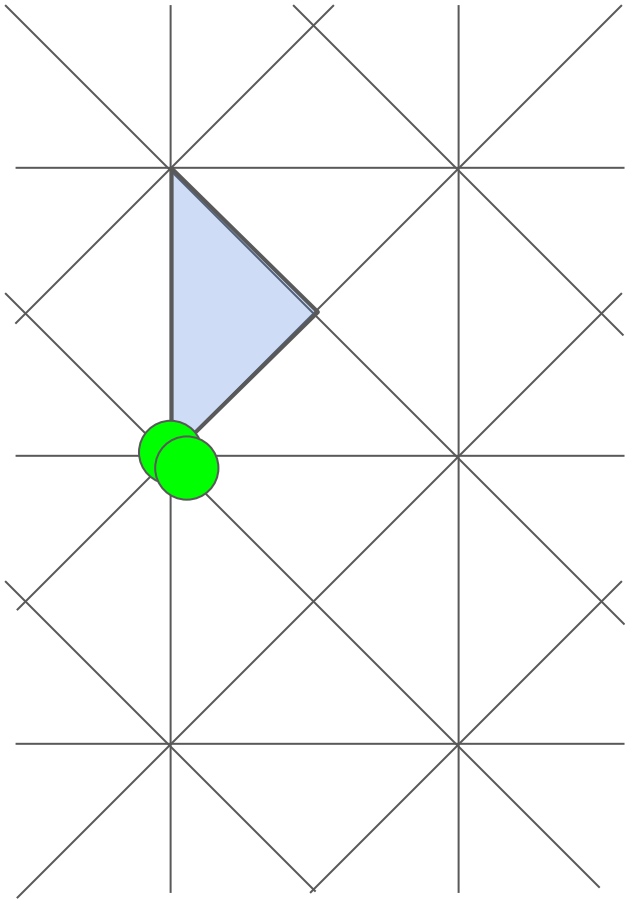
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Time complexity:  $O(n + H \cdot W)$

Memory complexity:  $O(H \cdot W)$