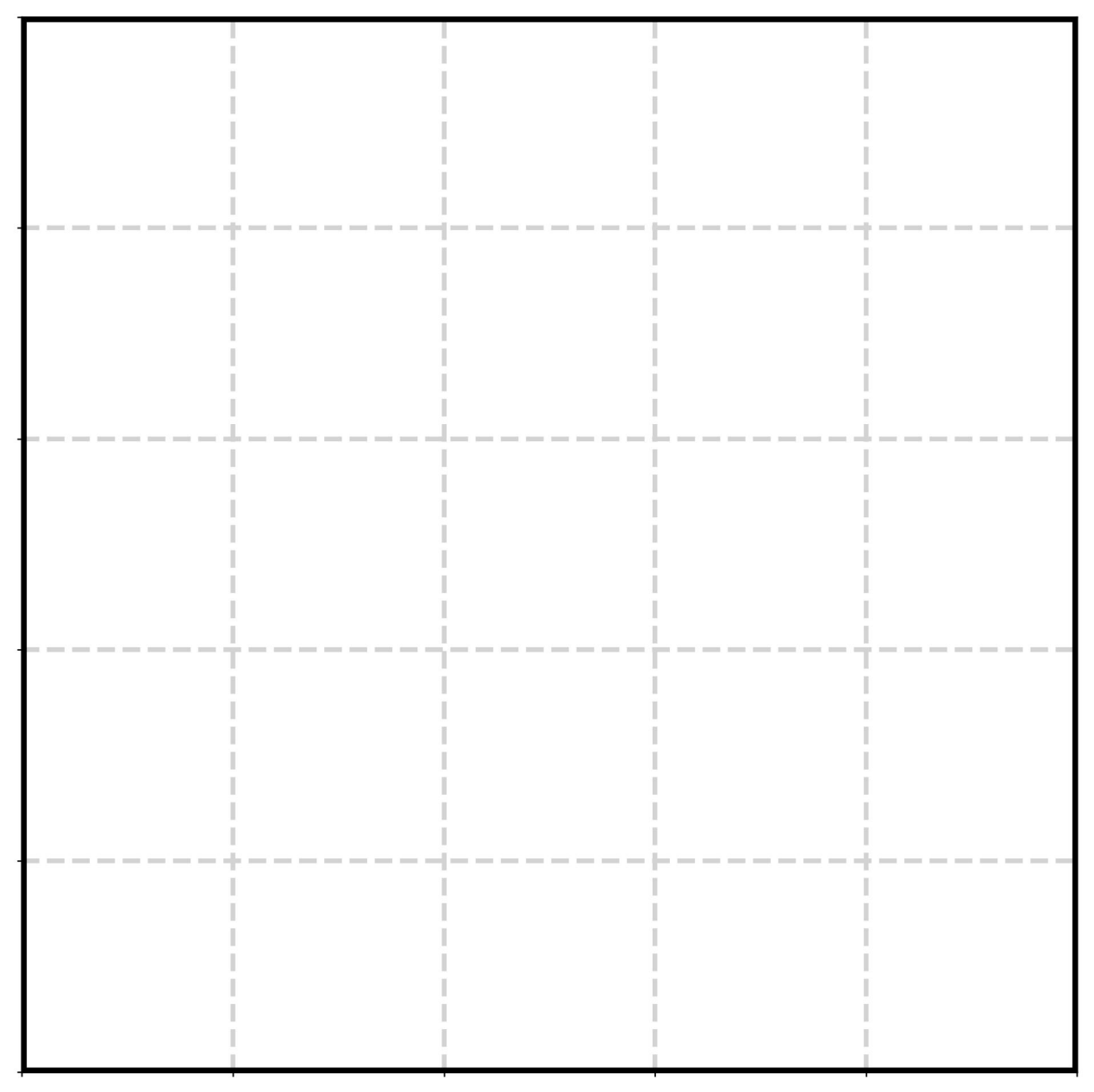
Rješenje kombinatornog problema

Sandro Paradžik

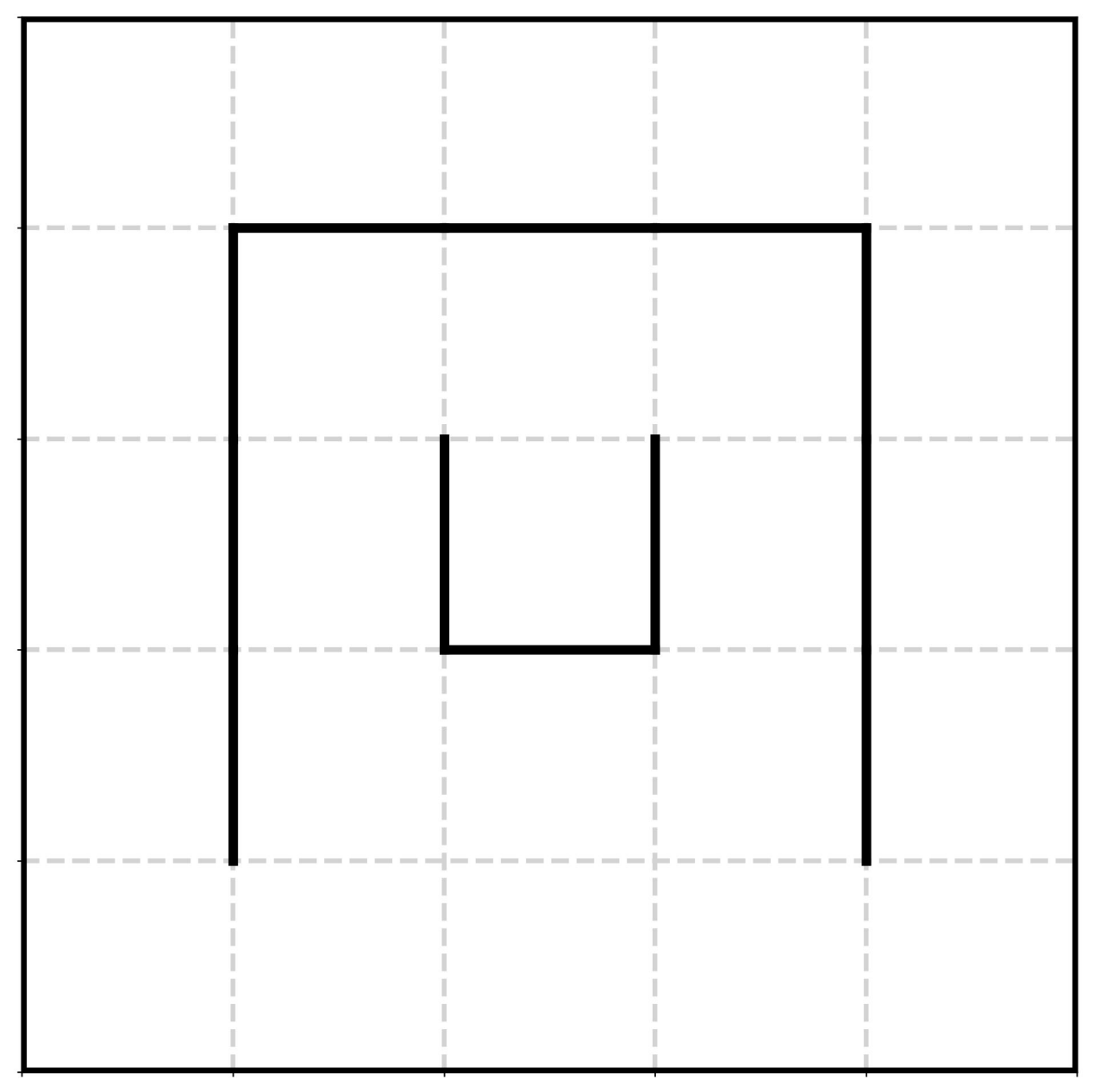
Sadržaj

Opis problema

Opis problema



Opis problema



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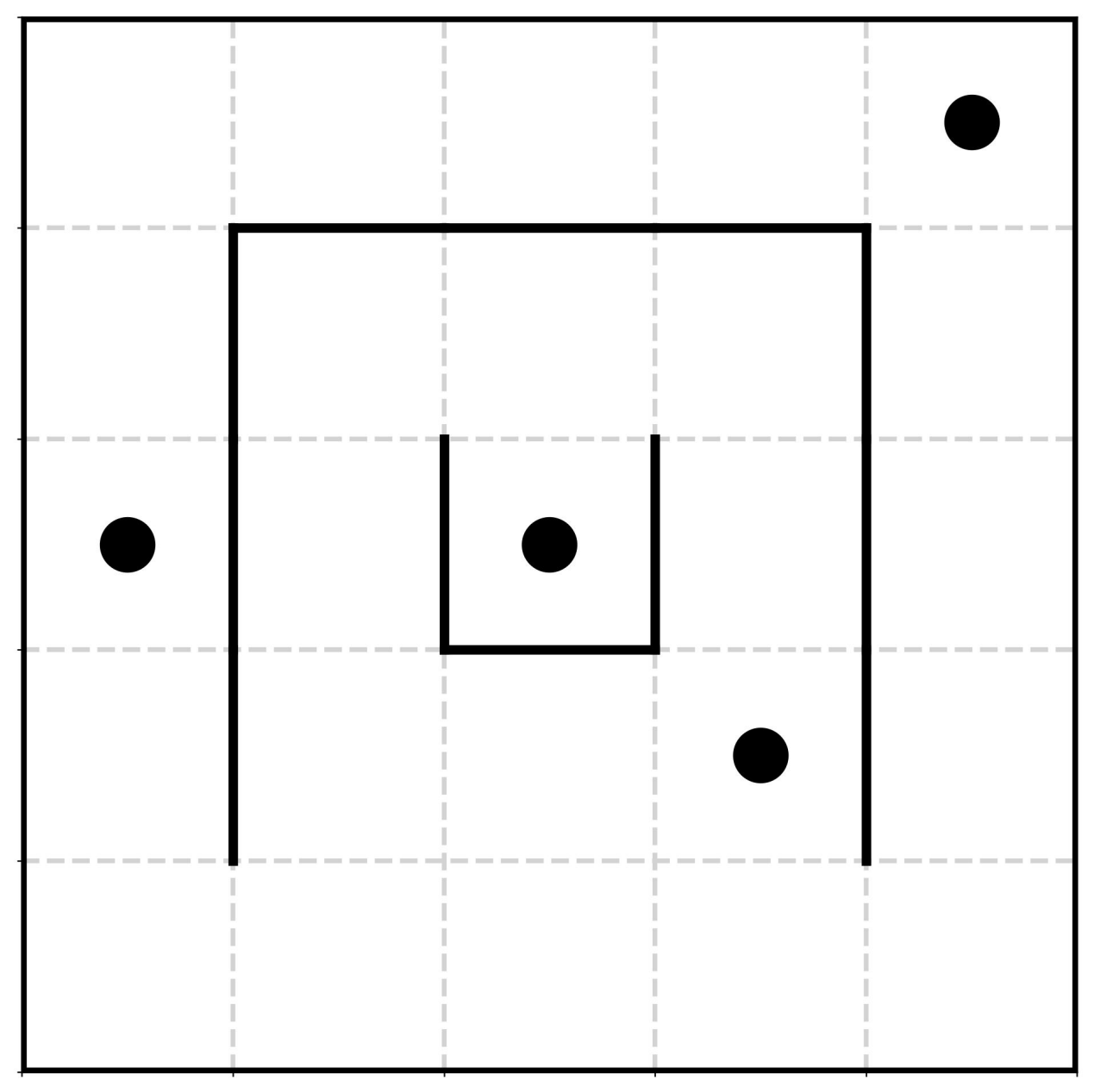
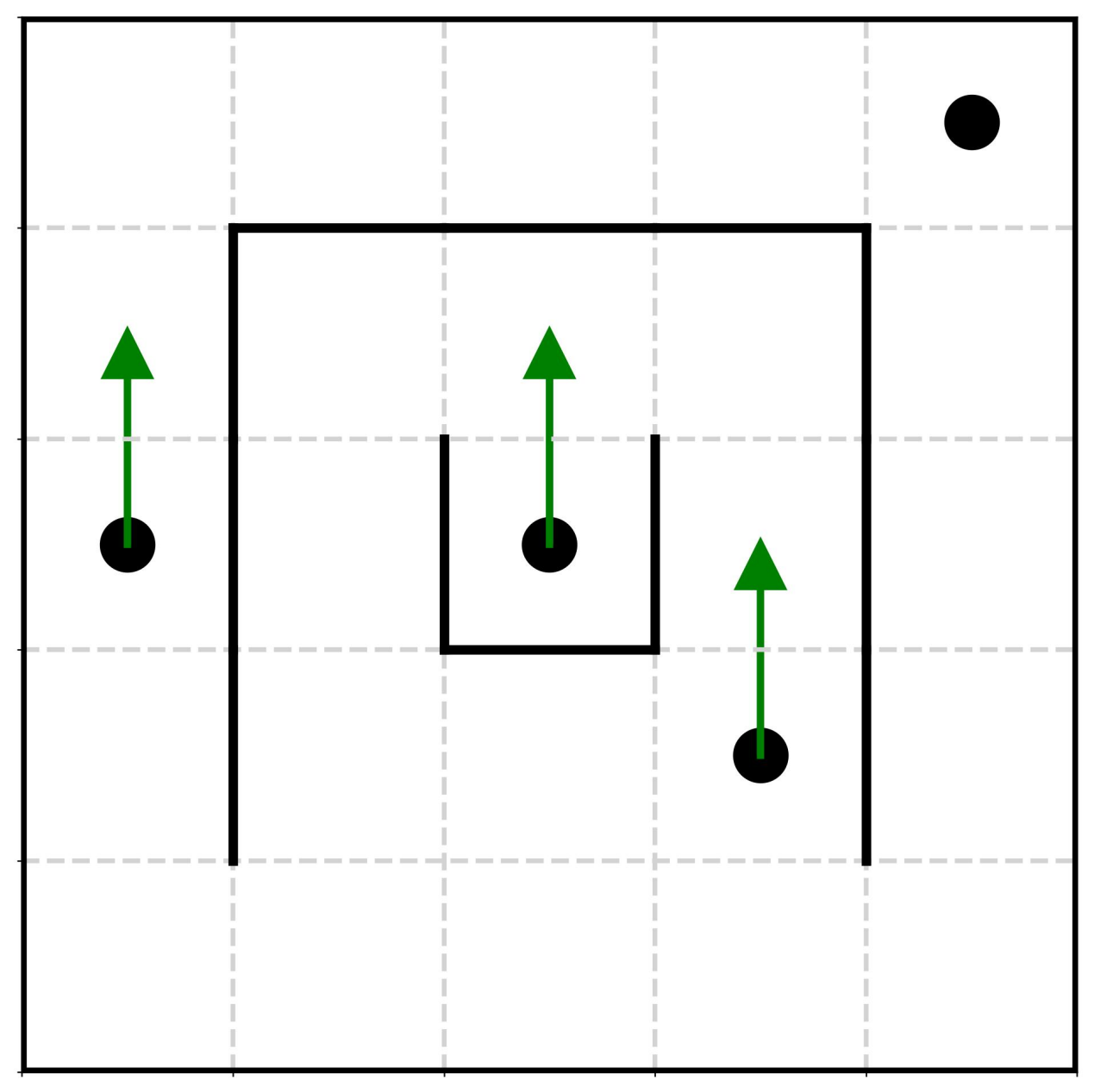


Opis problema - potez prema gore



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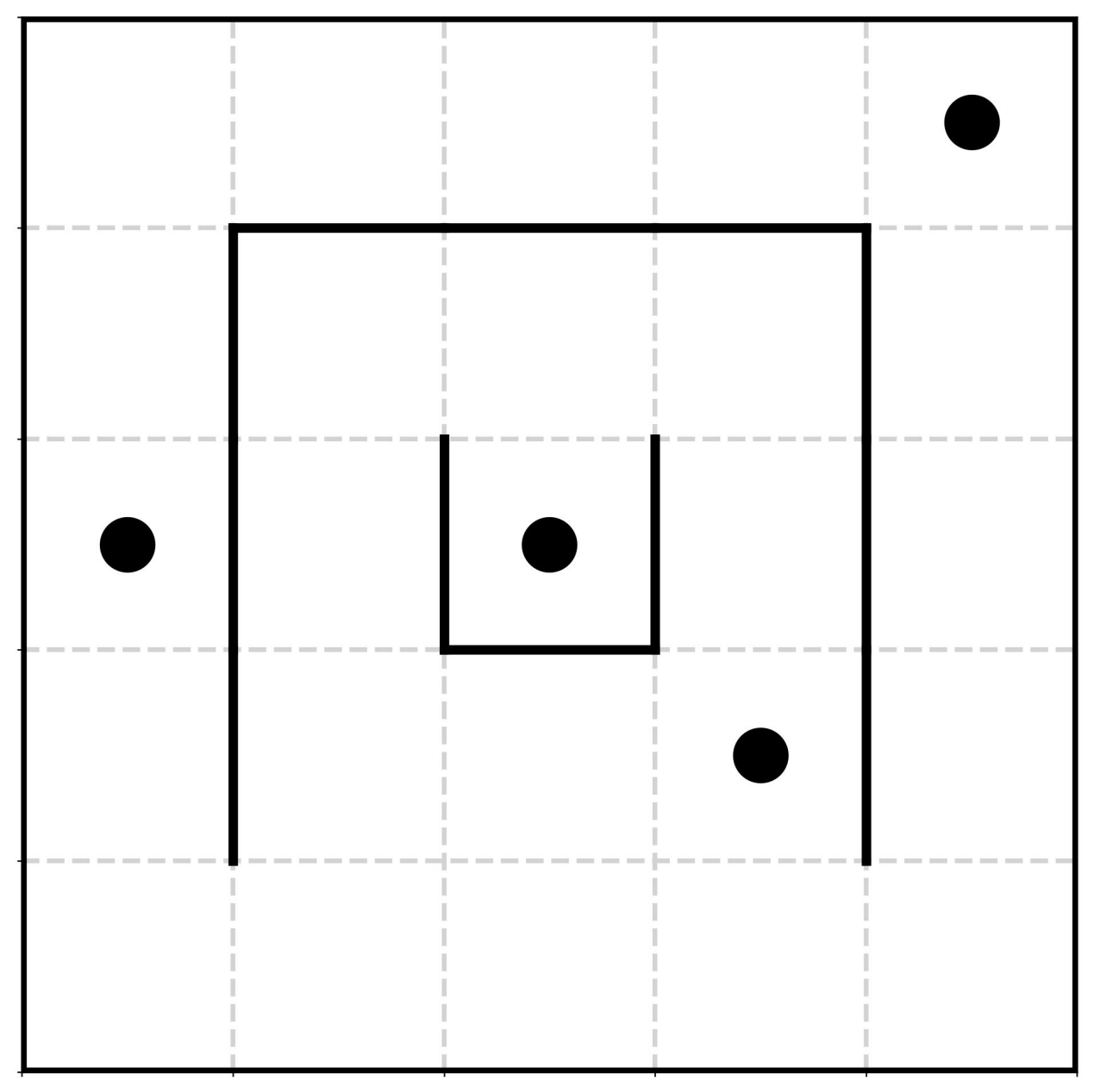
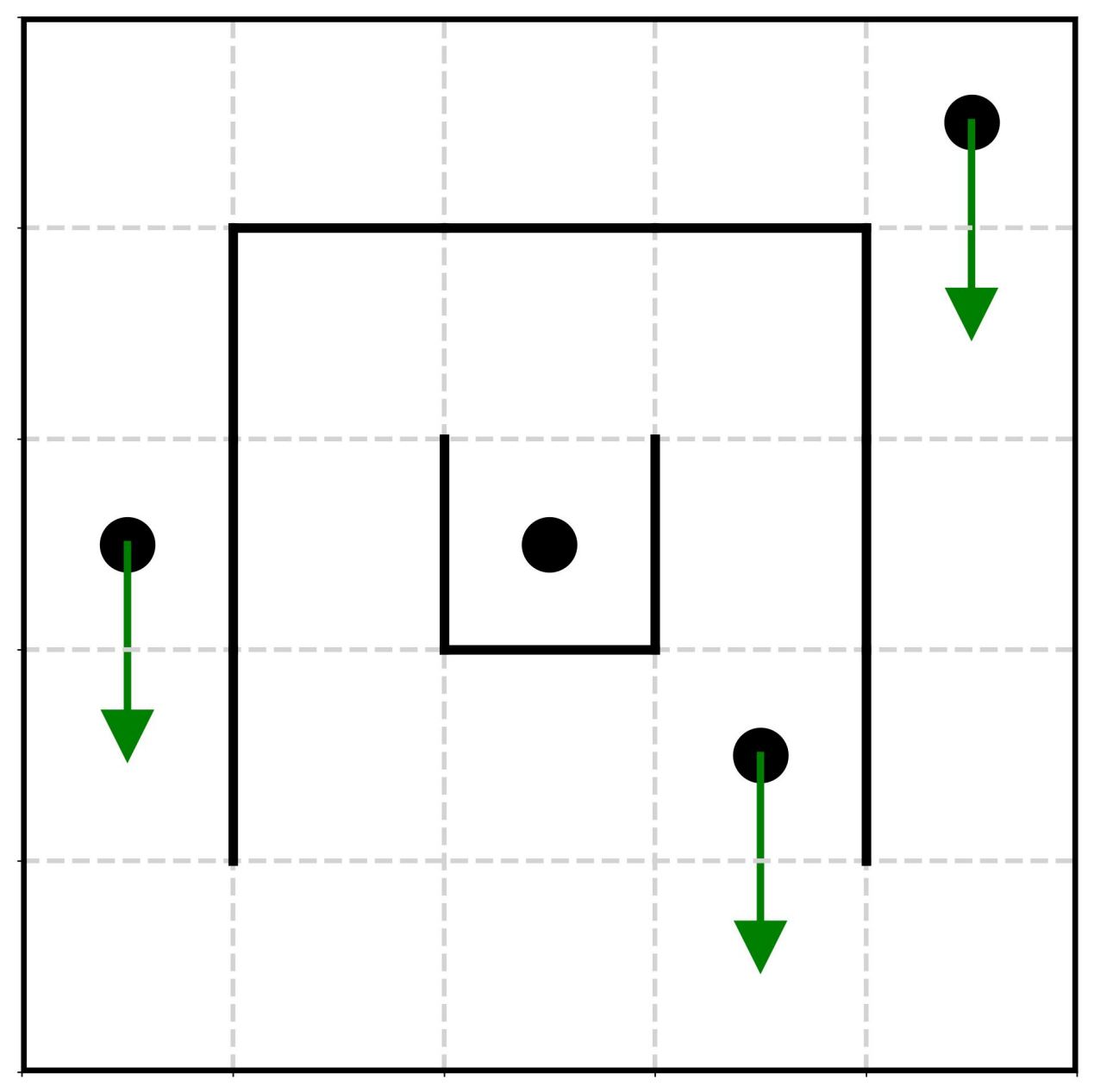
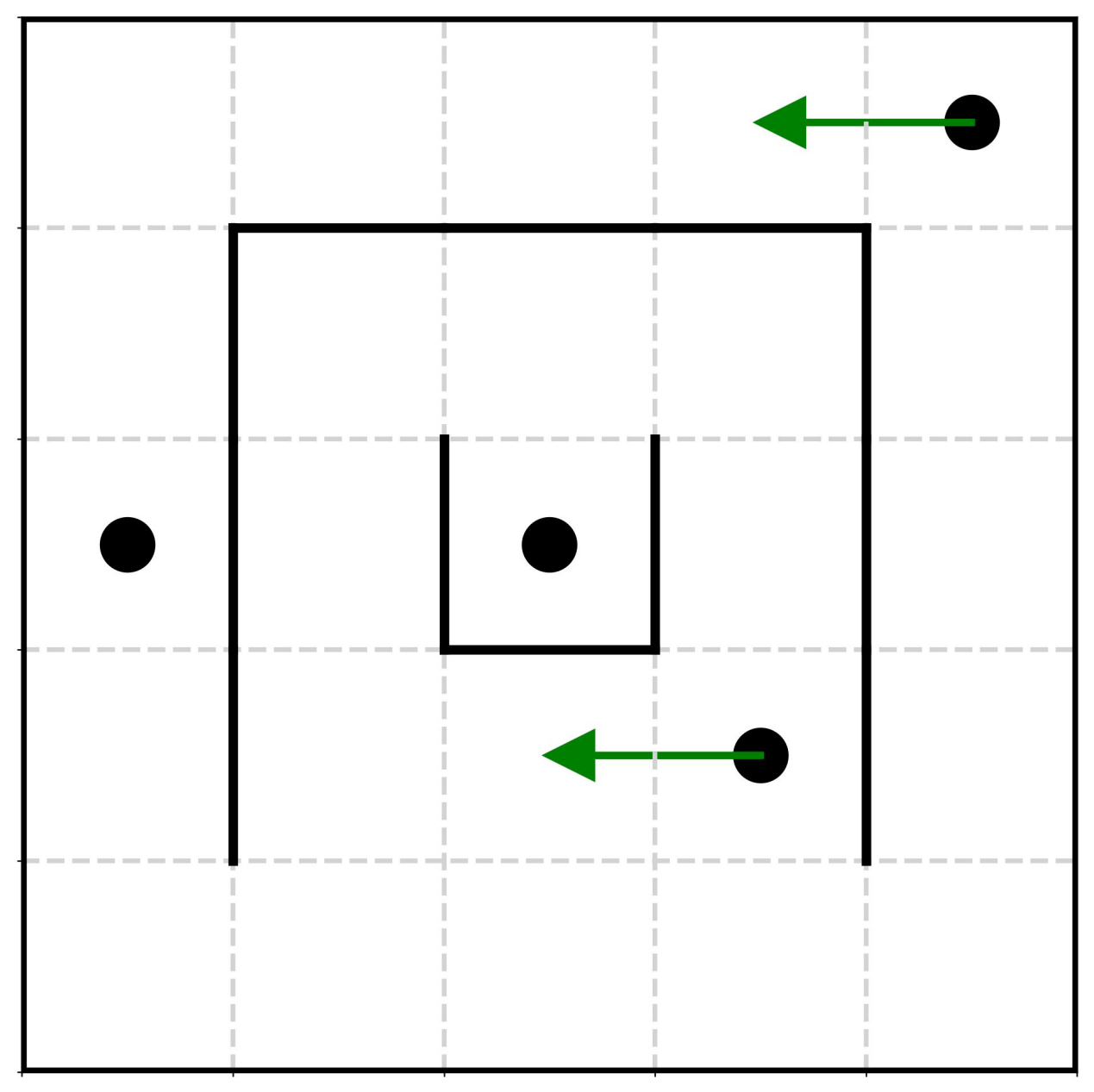


Opis problema - potez prema dole



Opis problema - potez prema lijevo

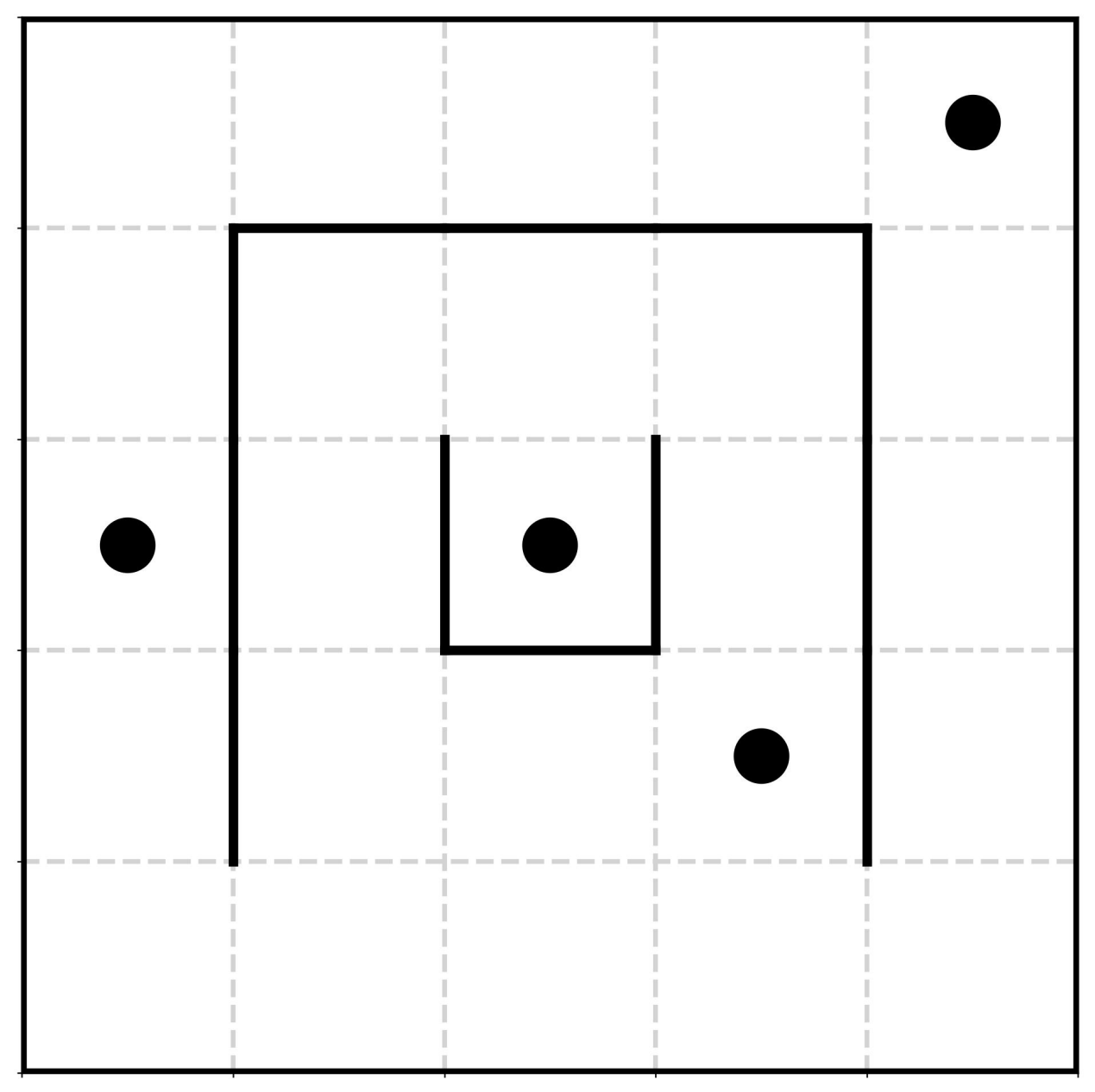


Opis problema

- Data je ploča nekih dimenzija
- Na ploču su postavljeni roboti i zidovi
- Zidovi su postavljeni tako da je iz svakog polja moguće doći u svako drugo bez da prolazimo kroz zid
- Svim robotima istovremeno dajemo komande: gore, dole, desno, lijevo
- Dokazati da je moguće sve robote dovesti na isto polje ploče

Rješenje

Algoritam



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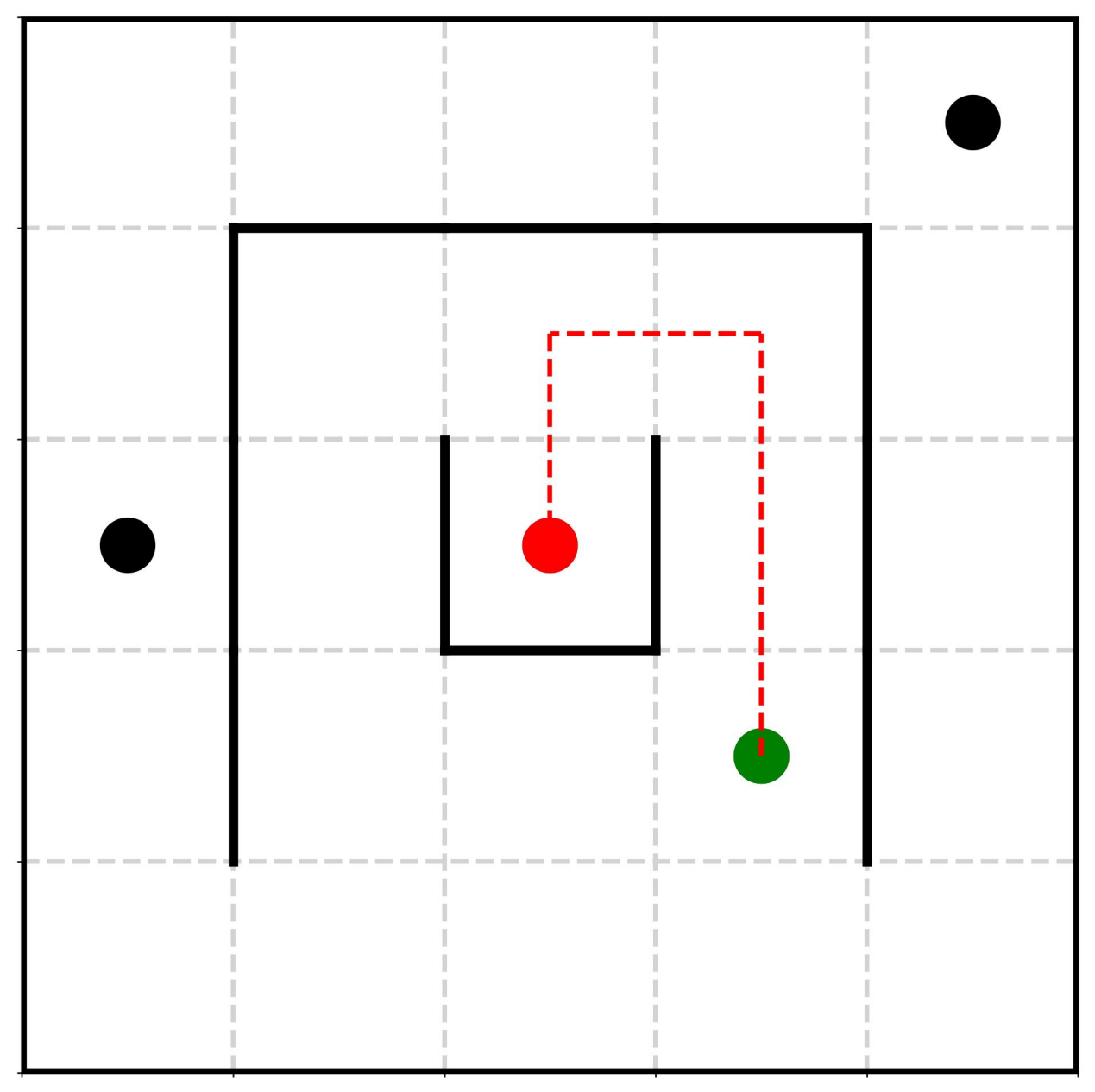

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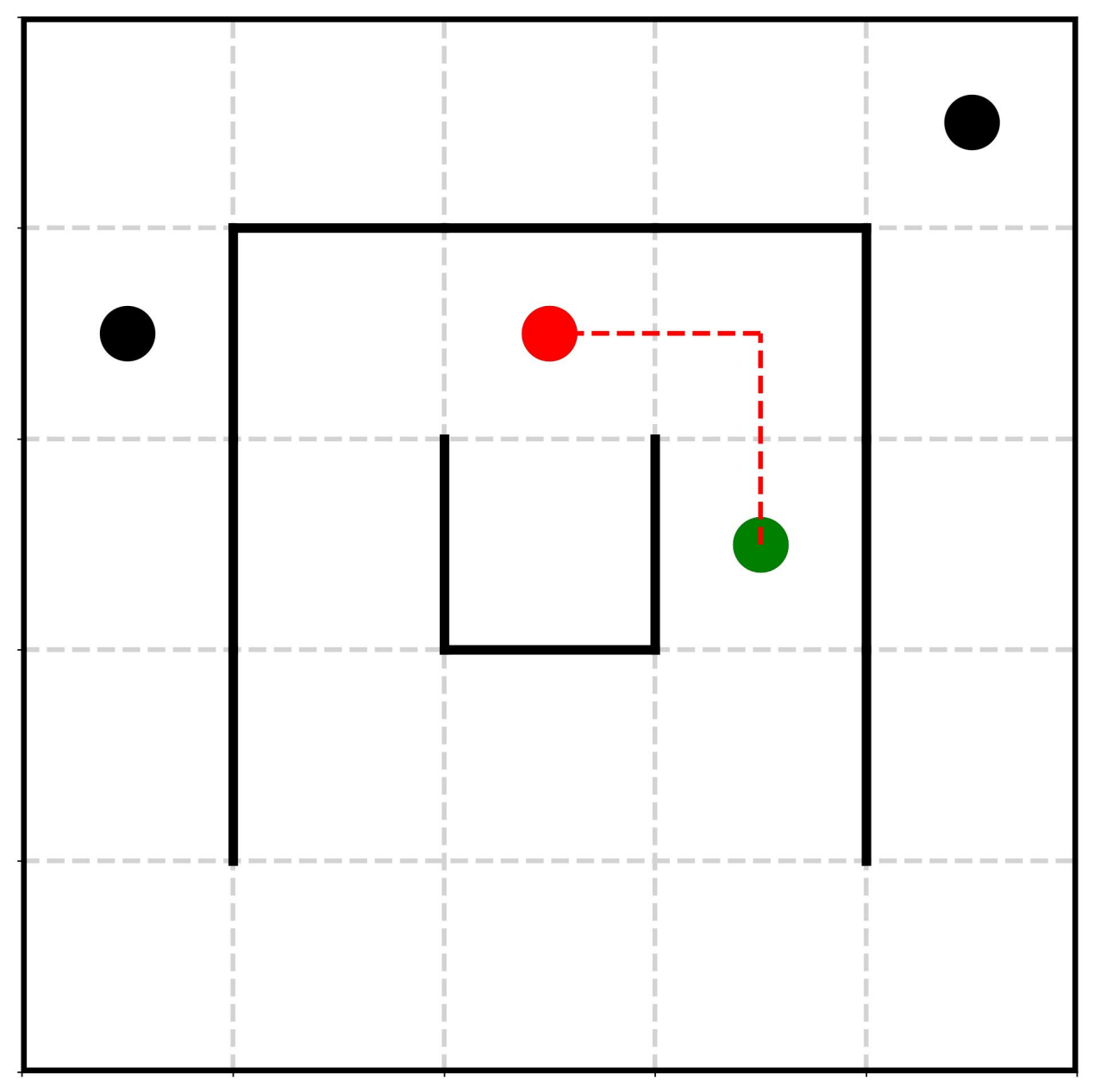

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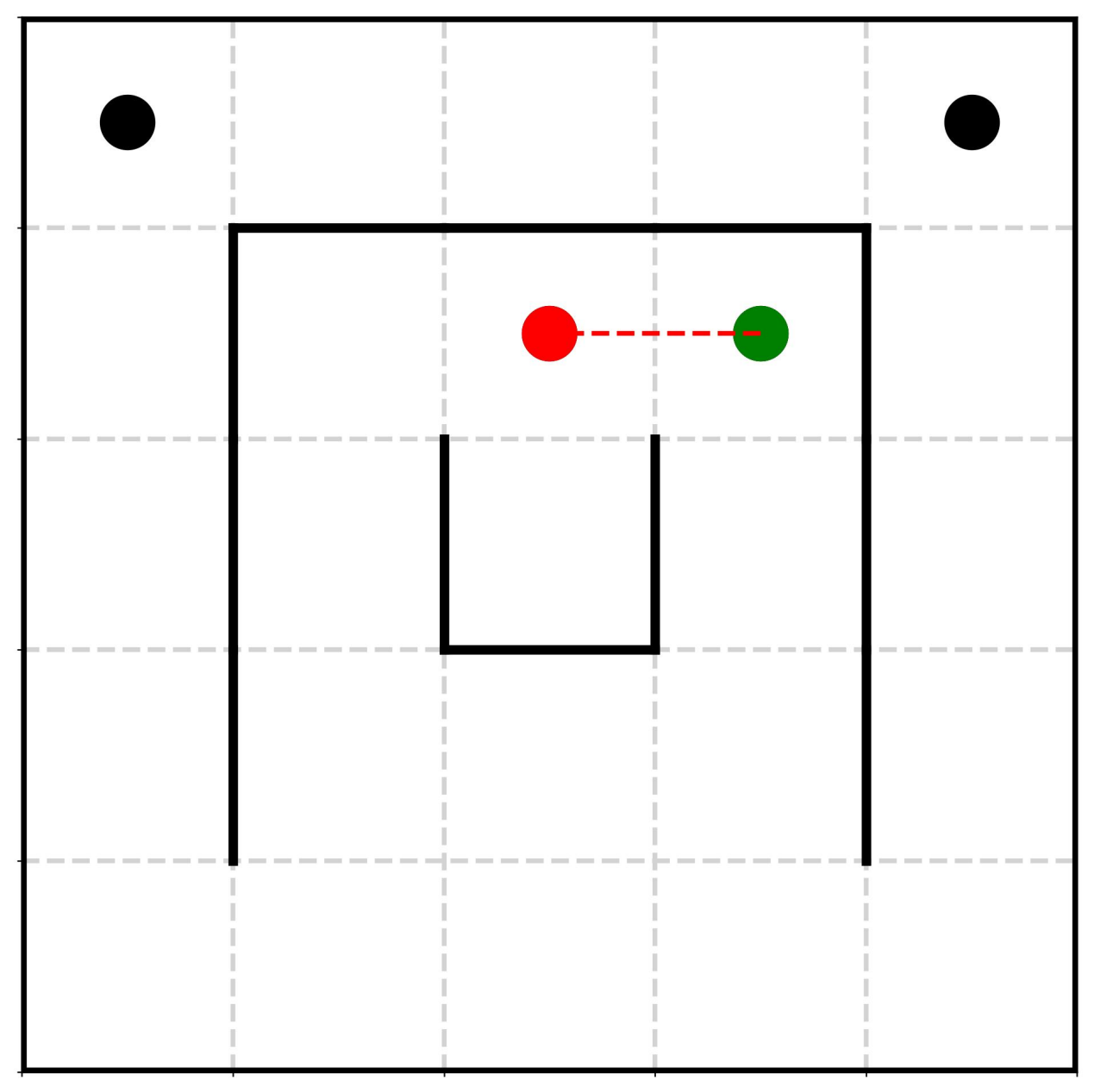

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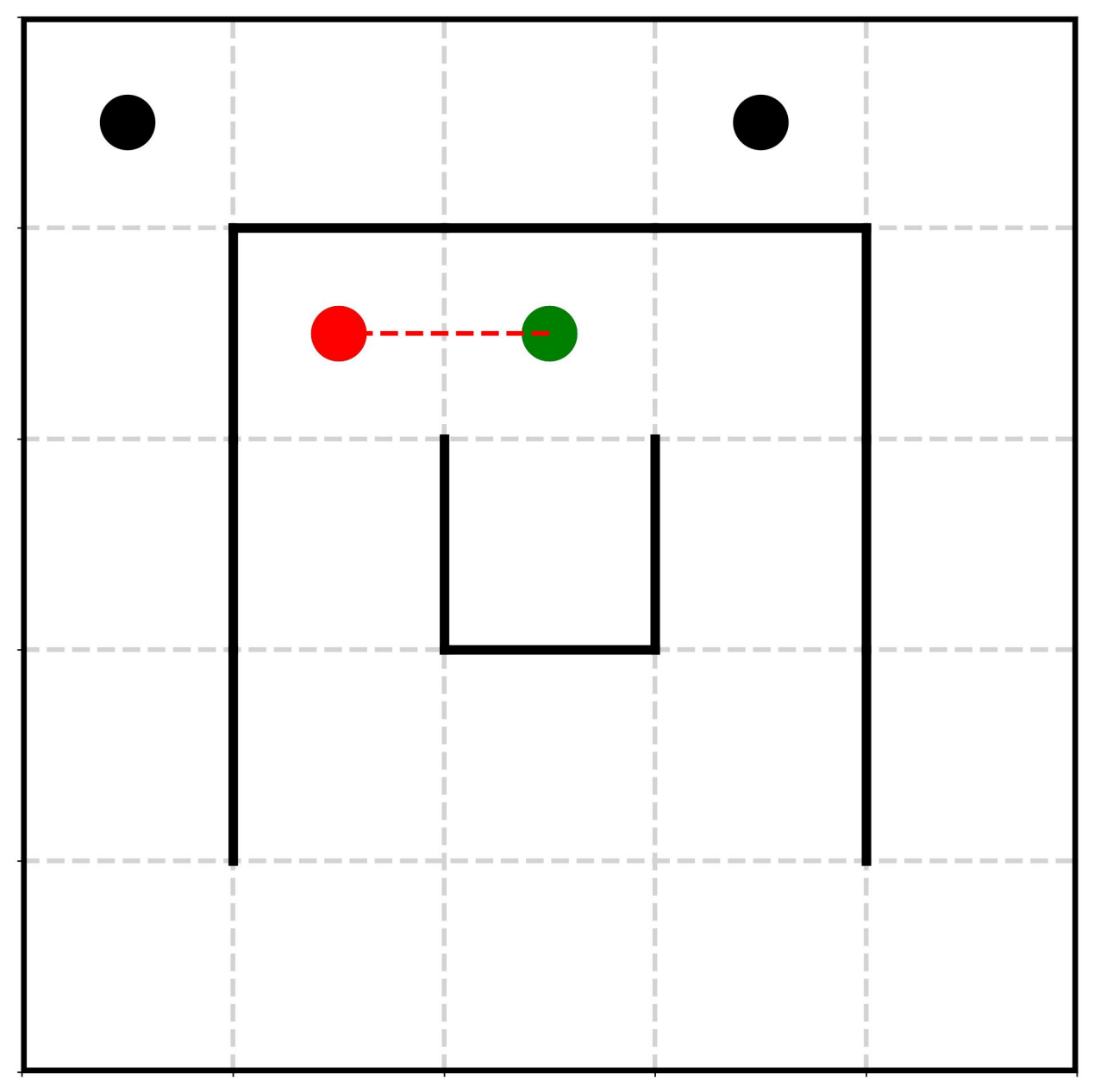

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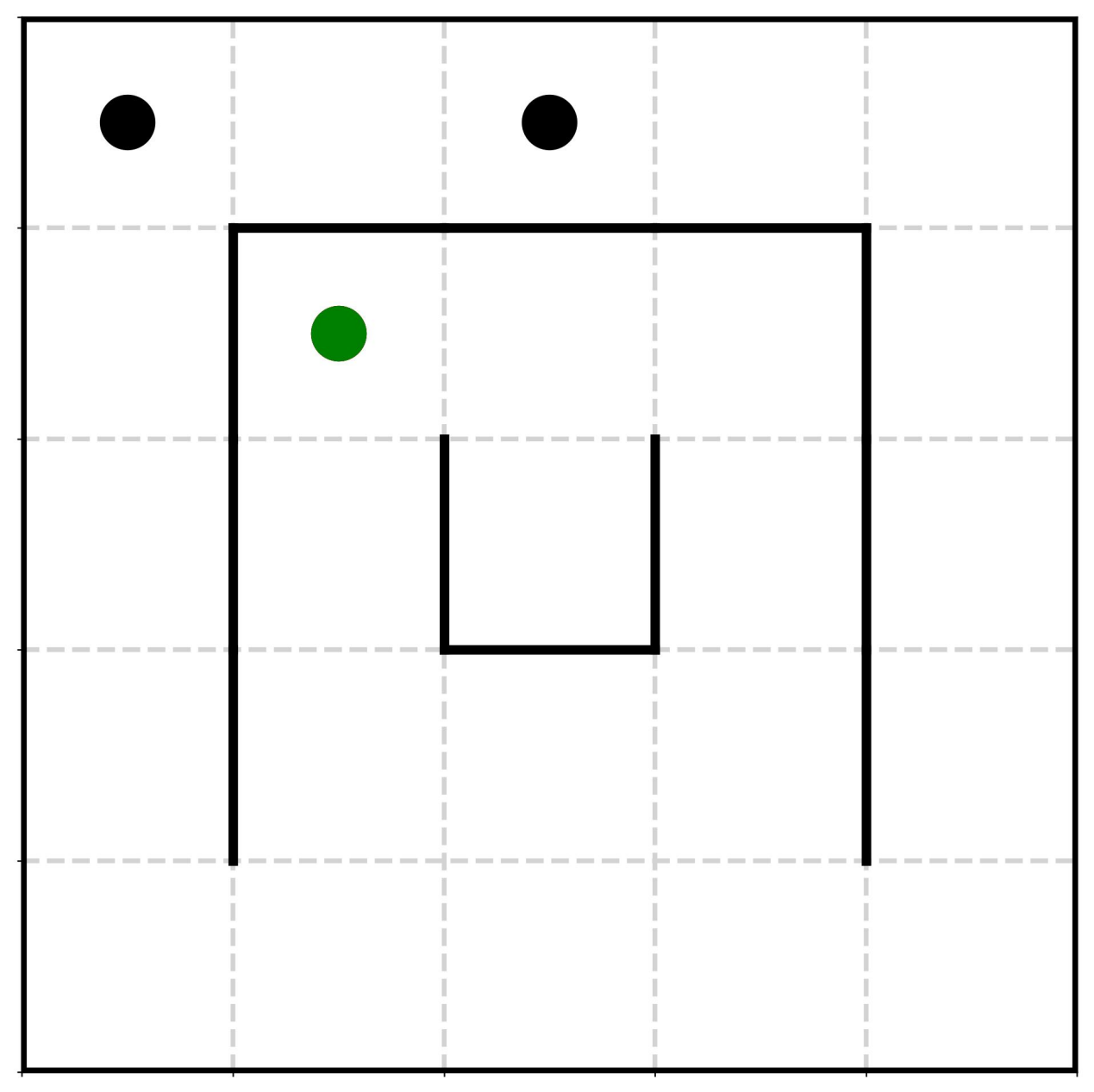

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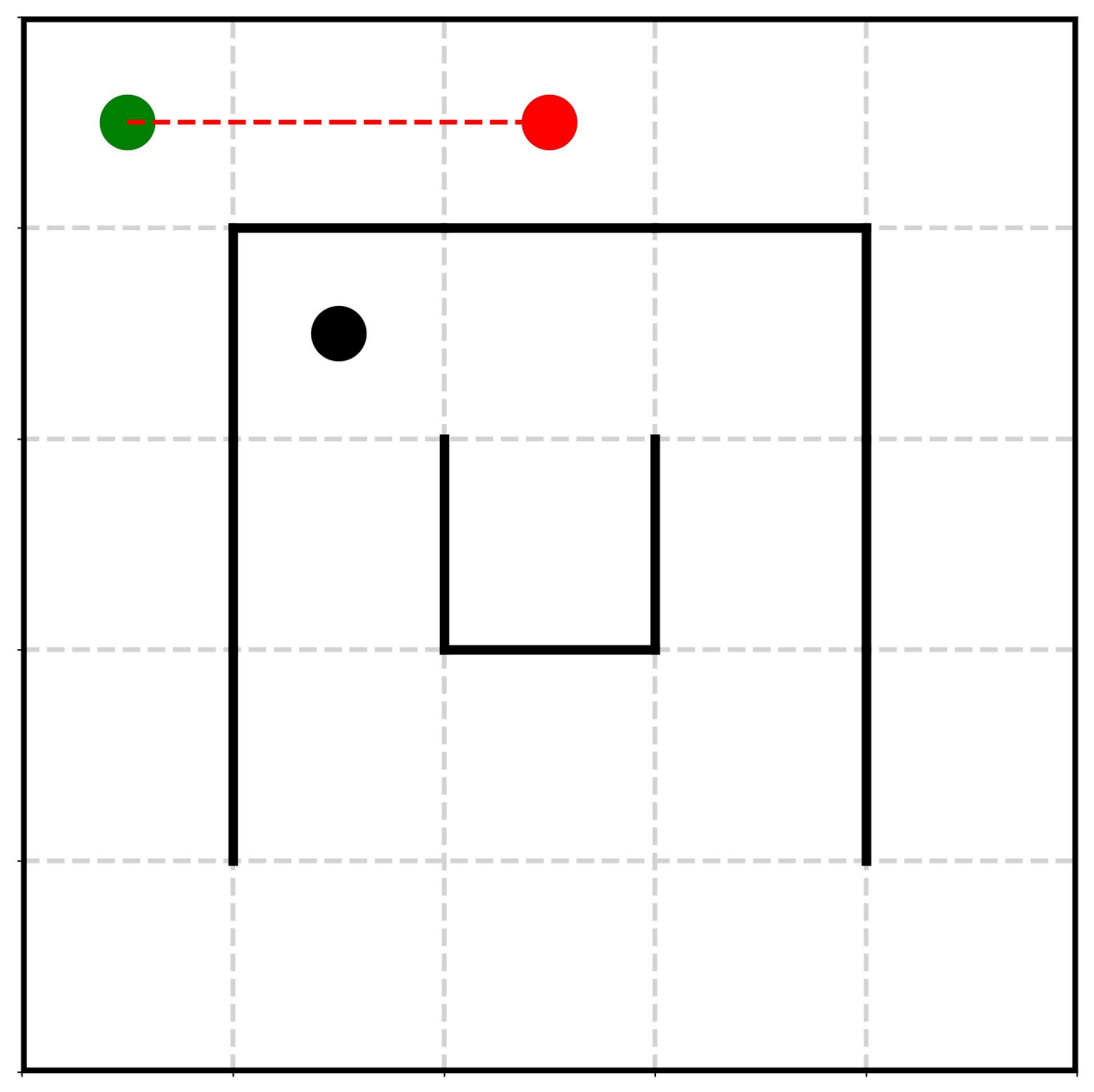

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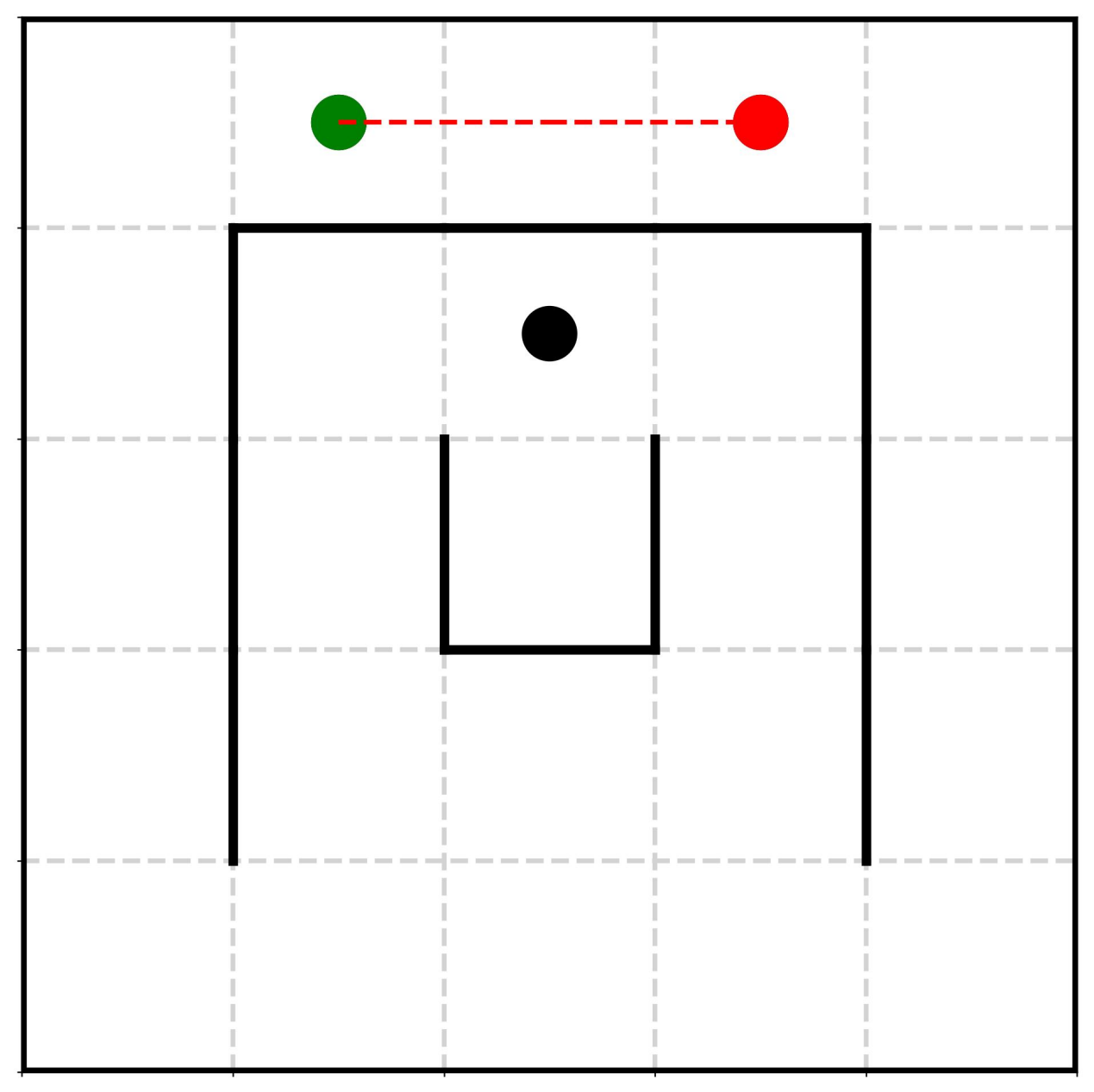

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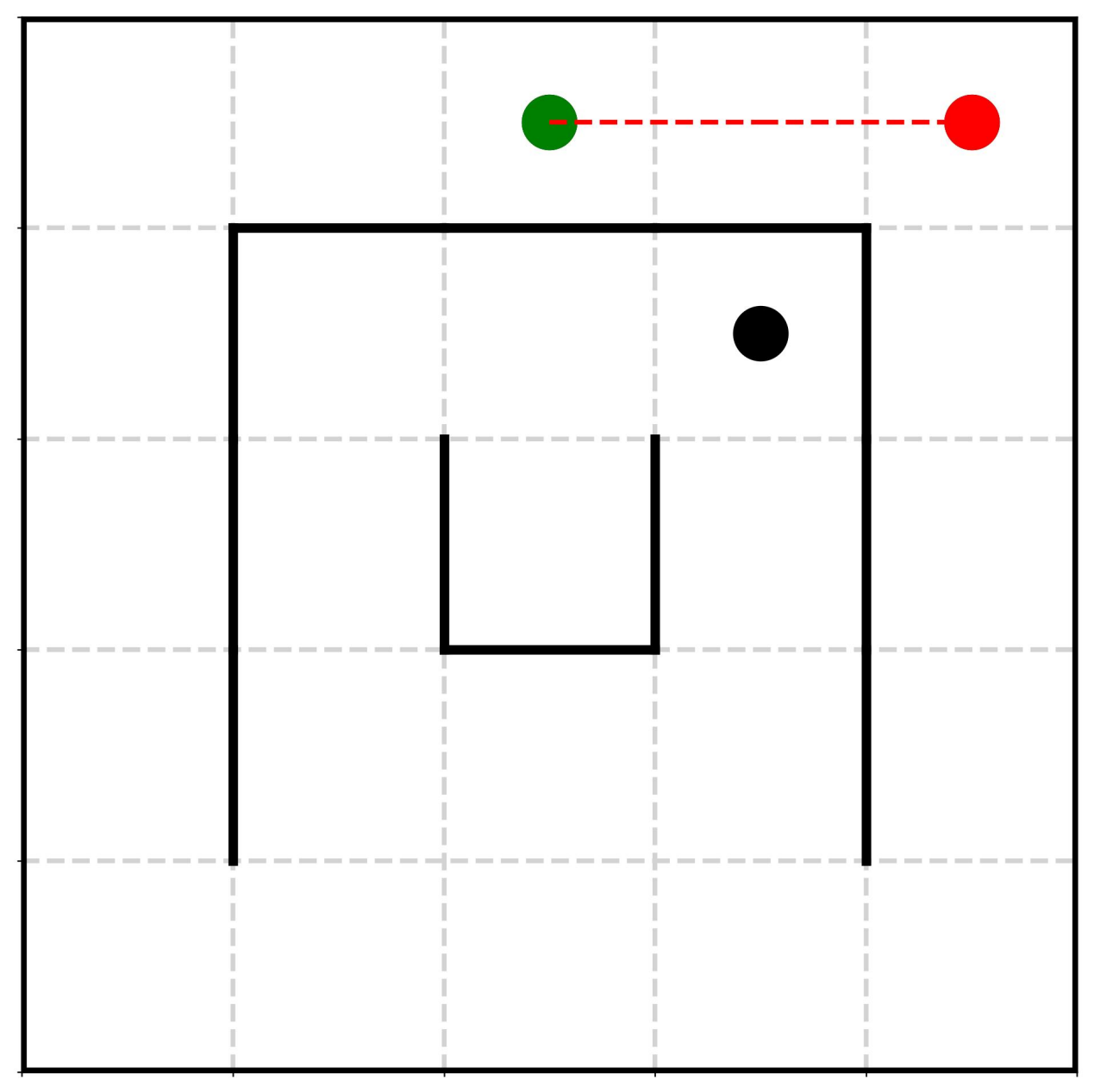

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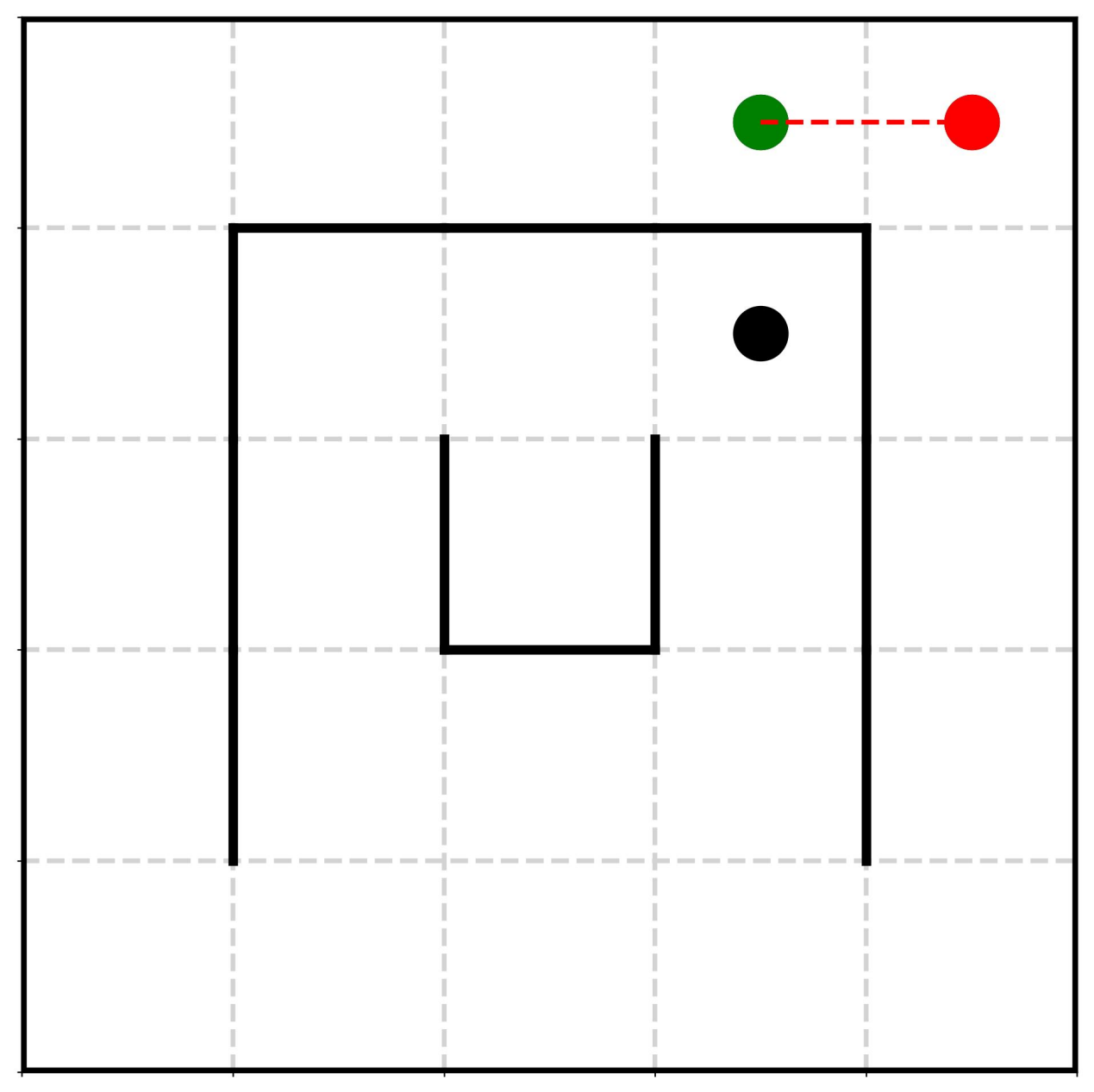

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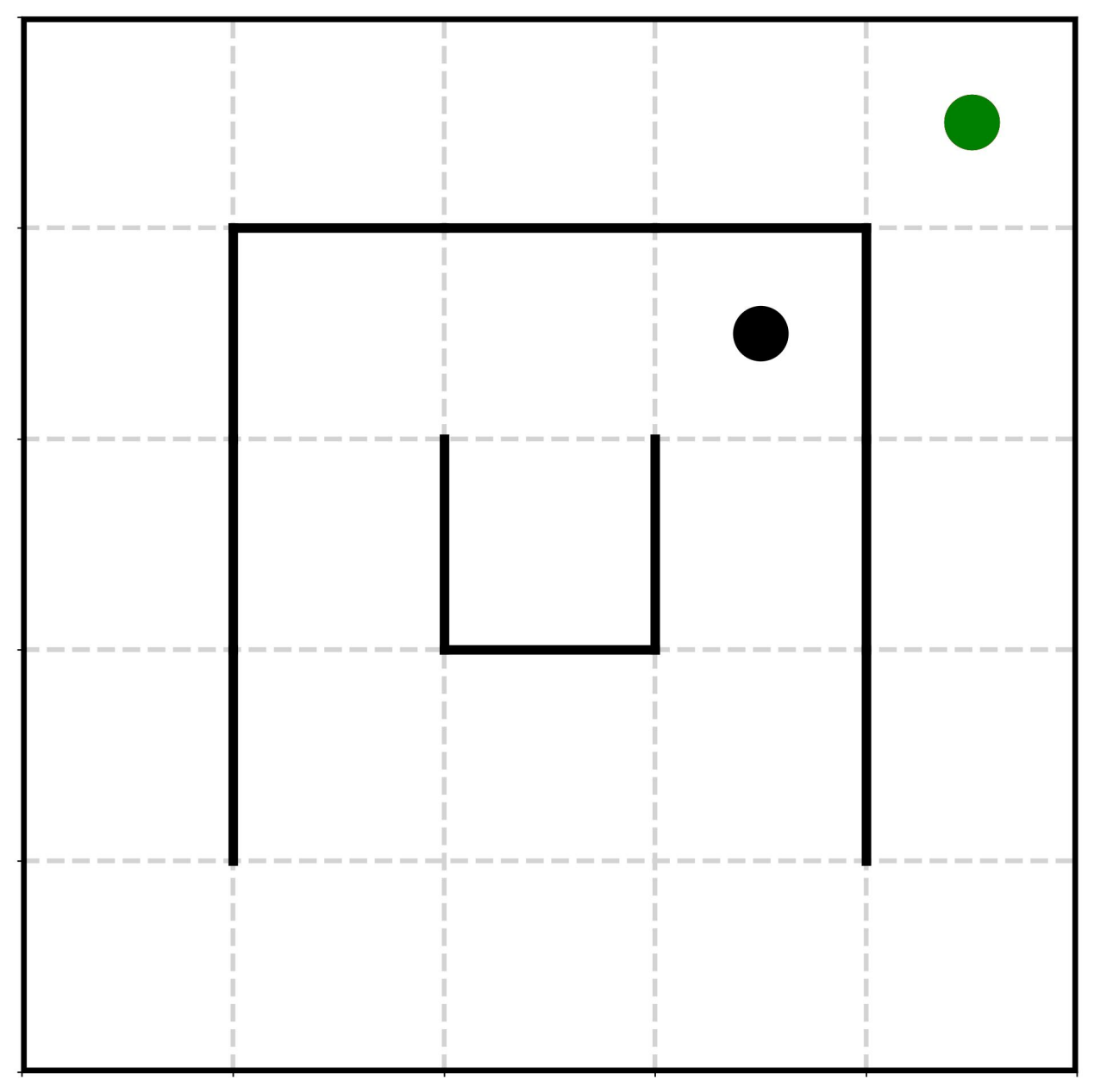

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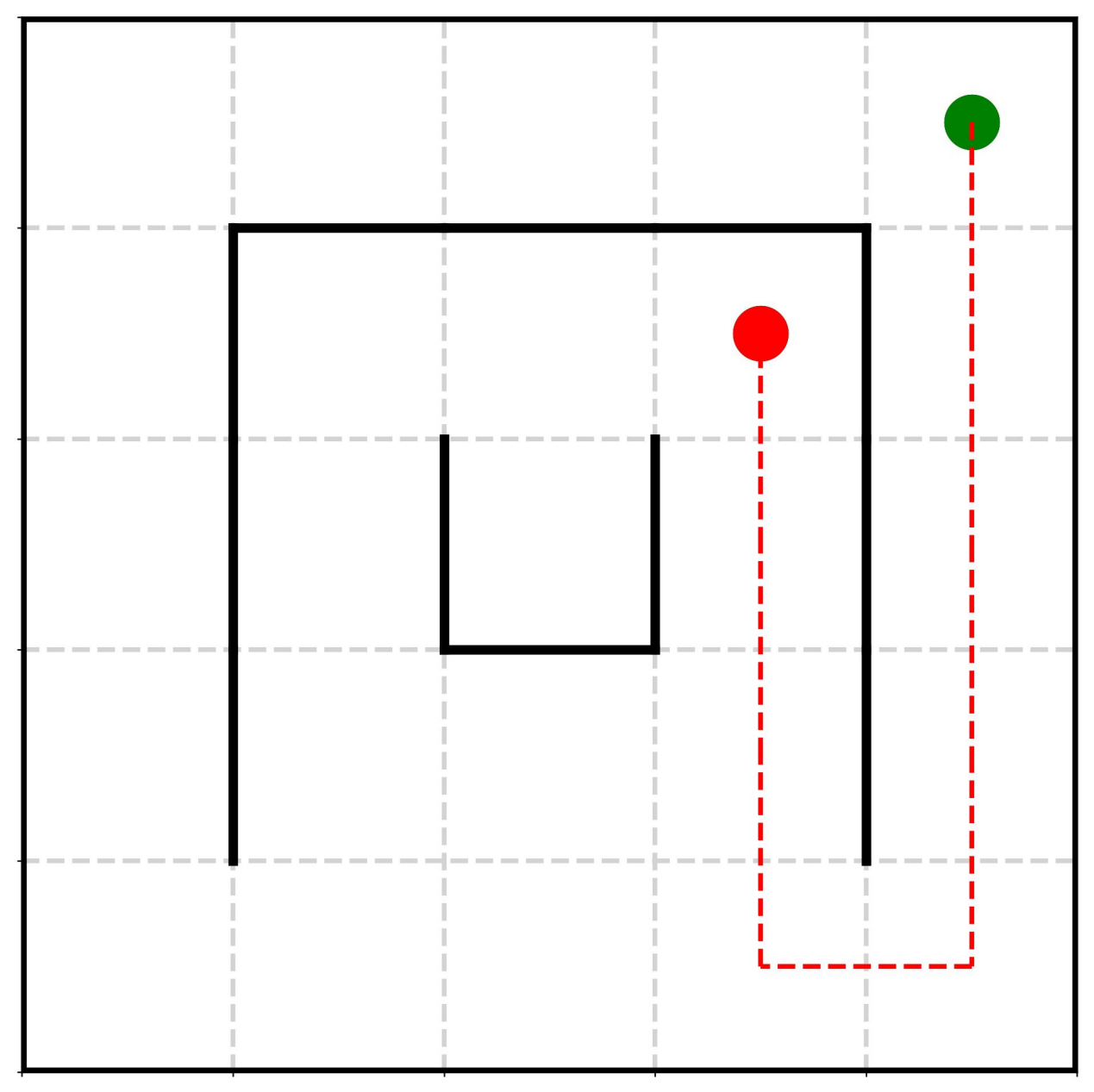

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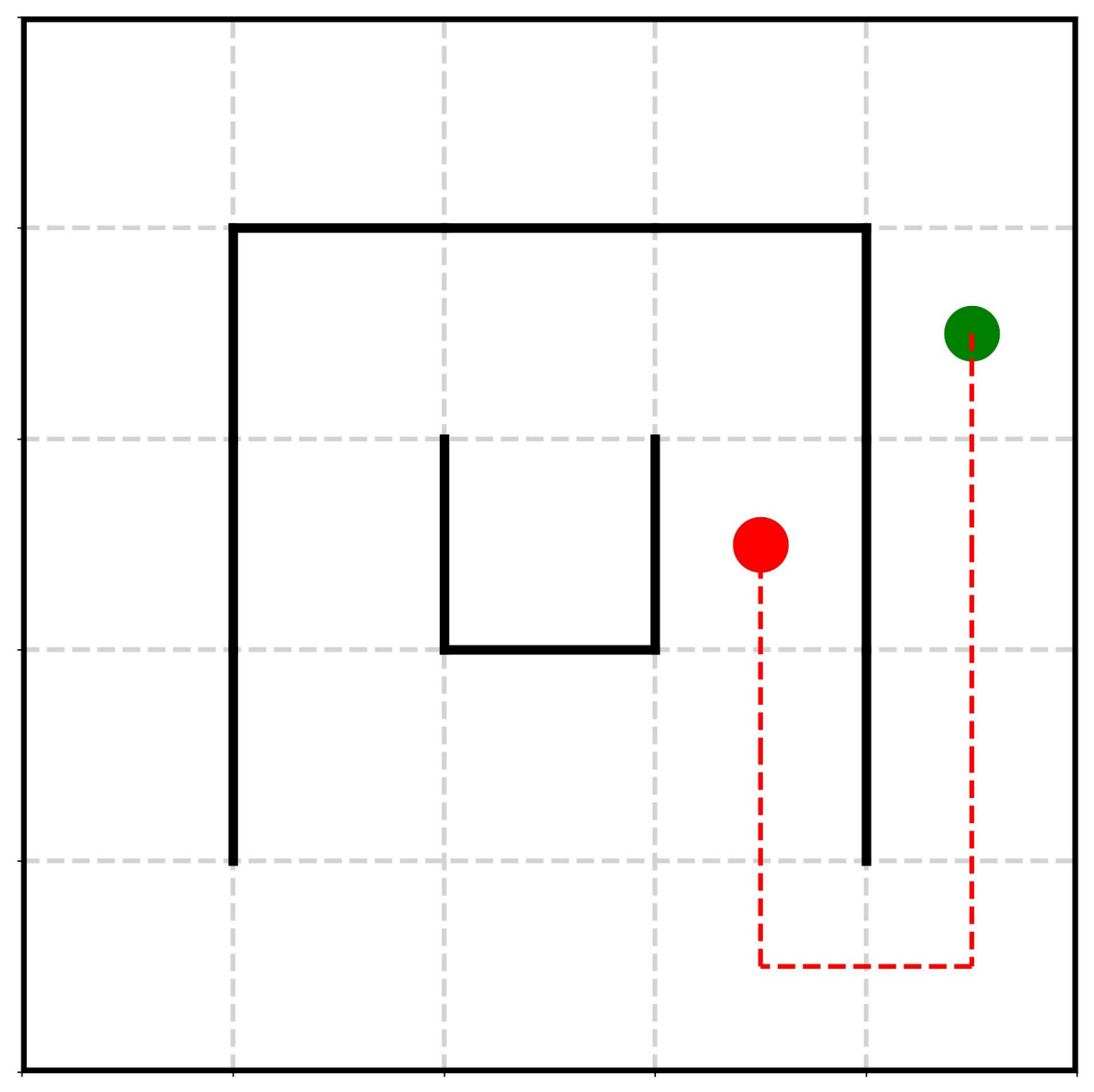

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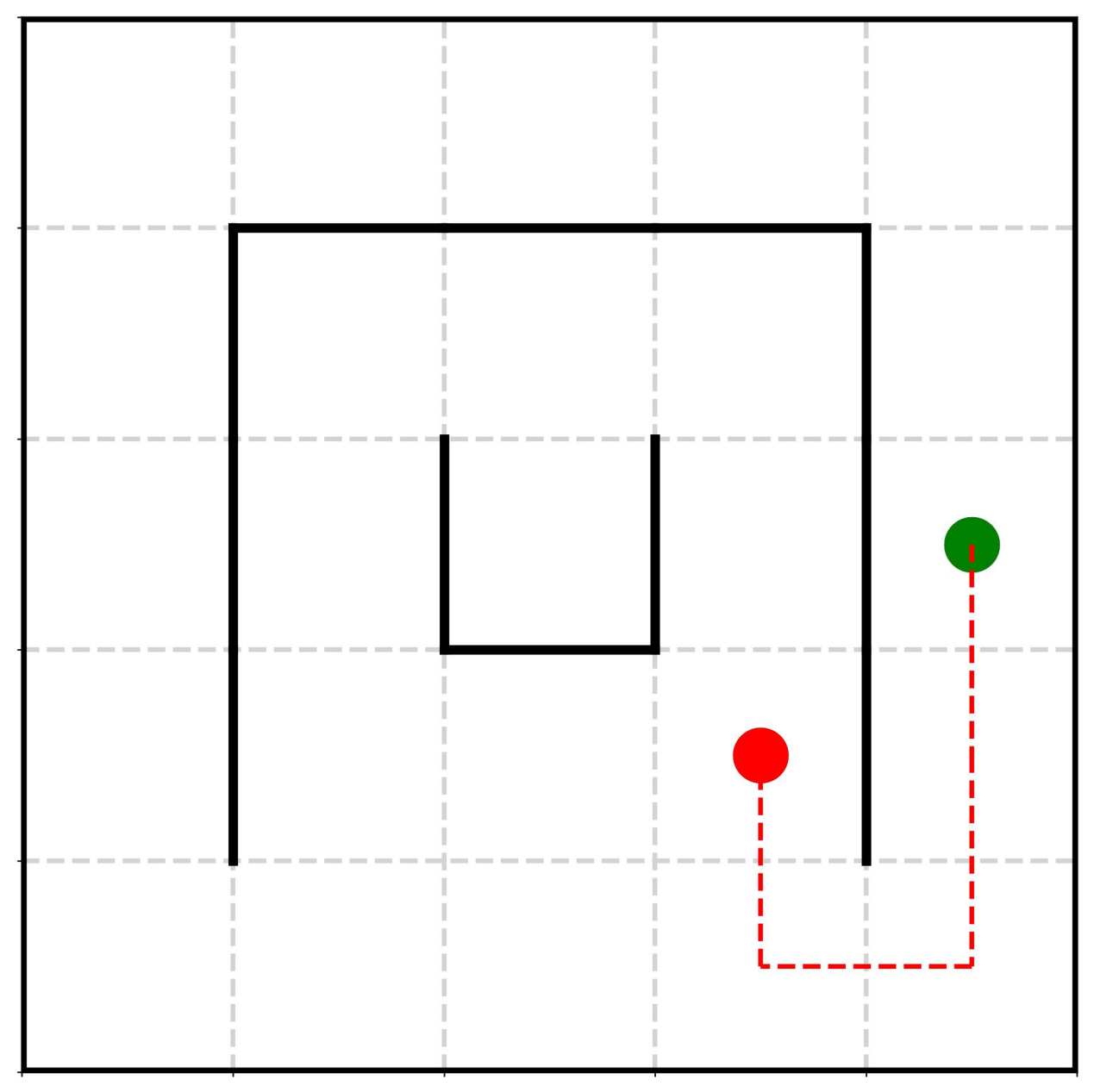

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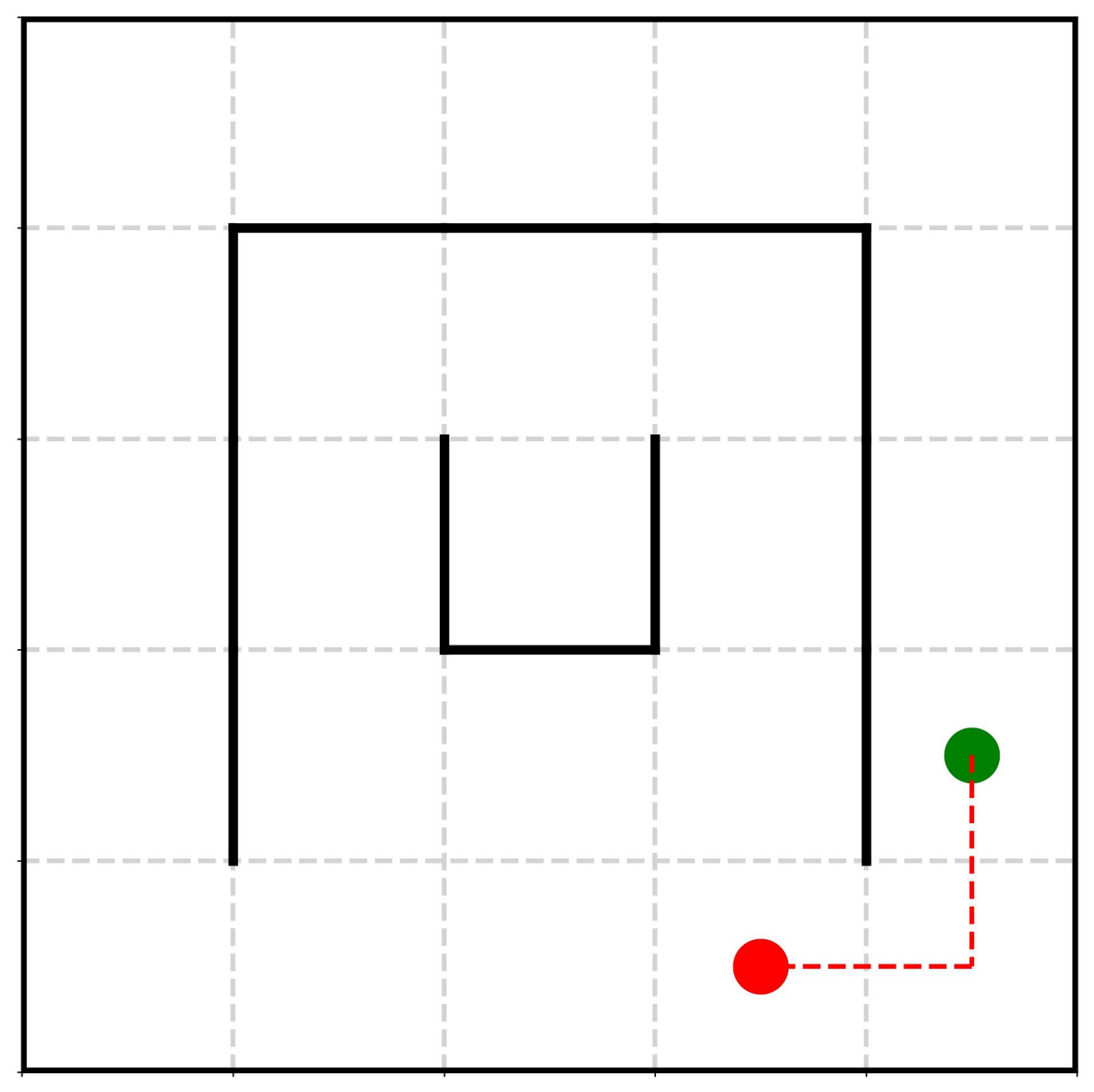

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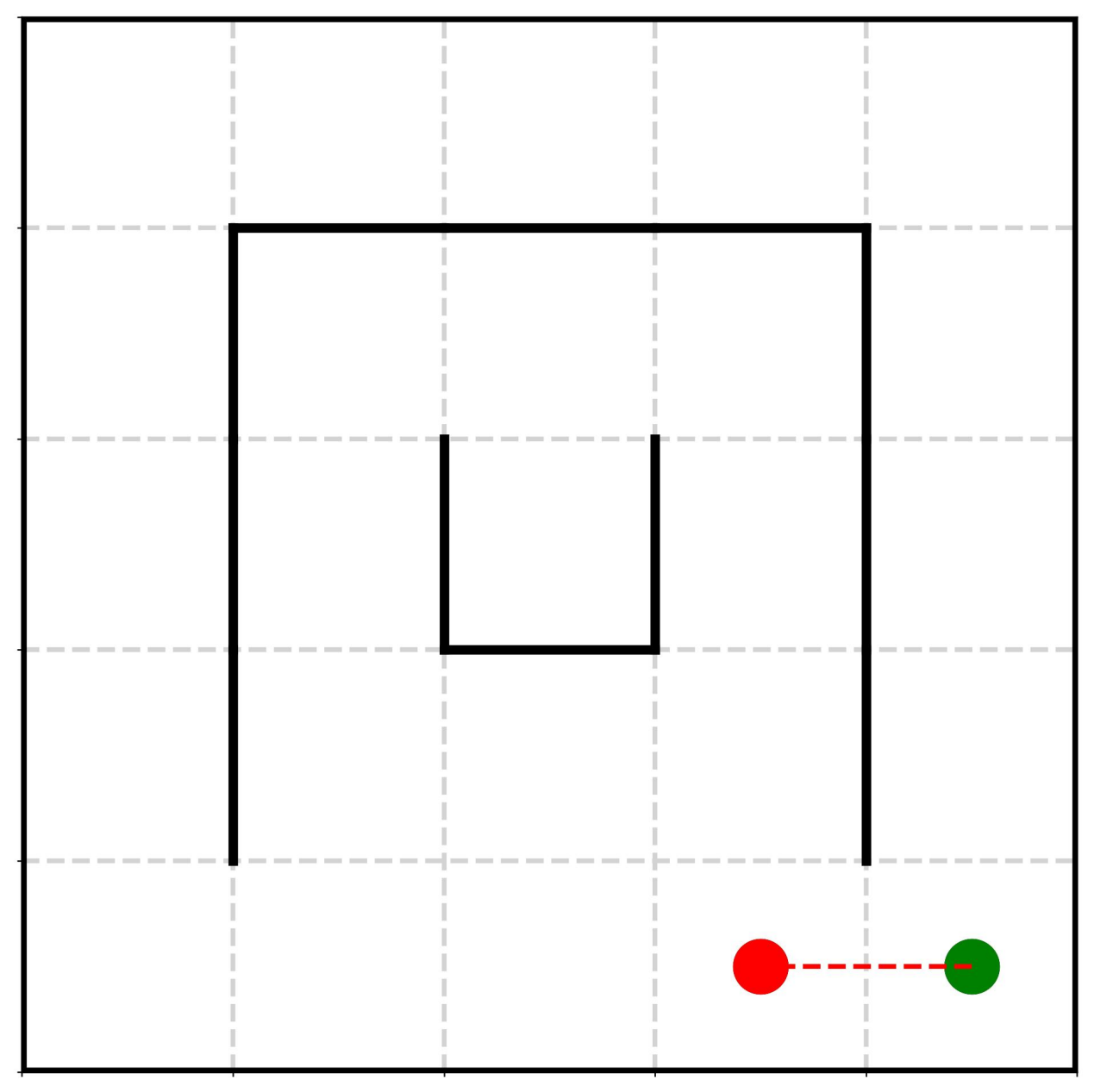

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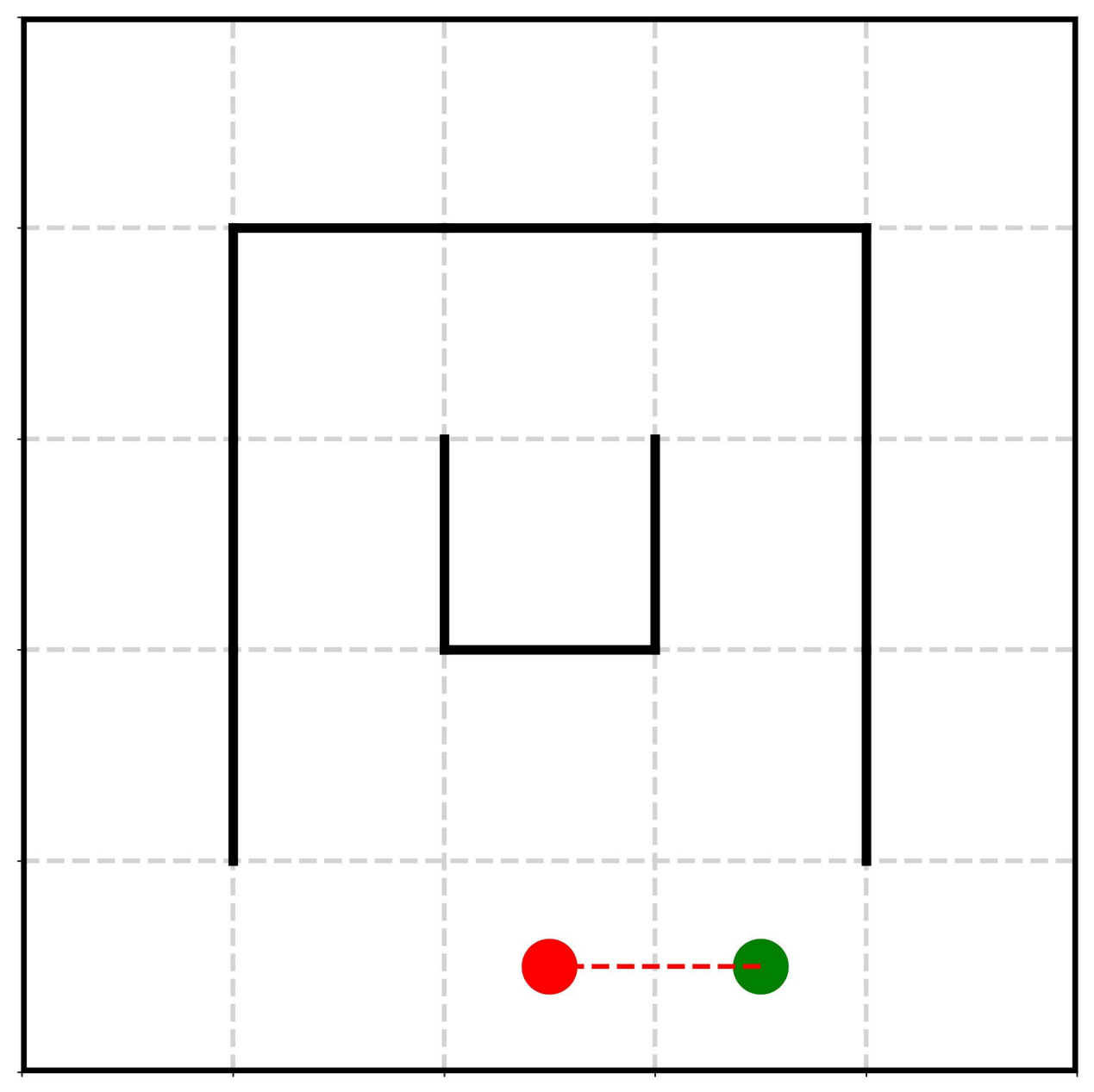

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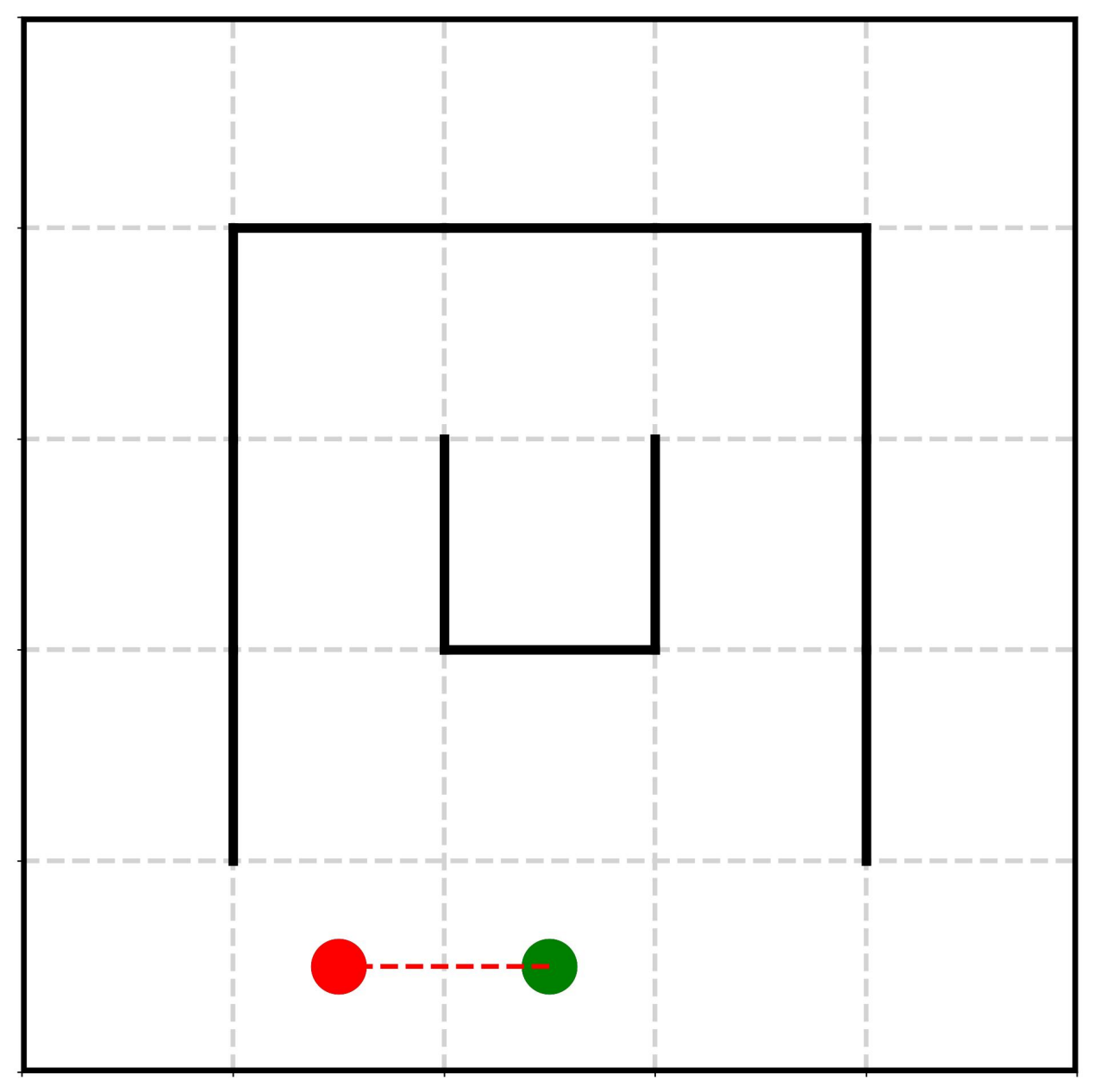

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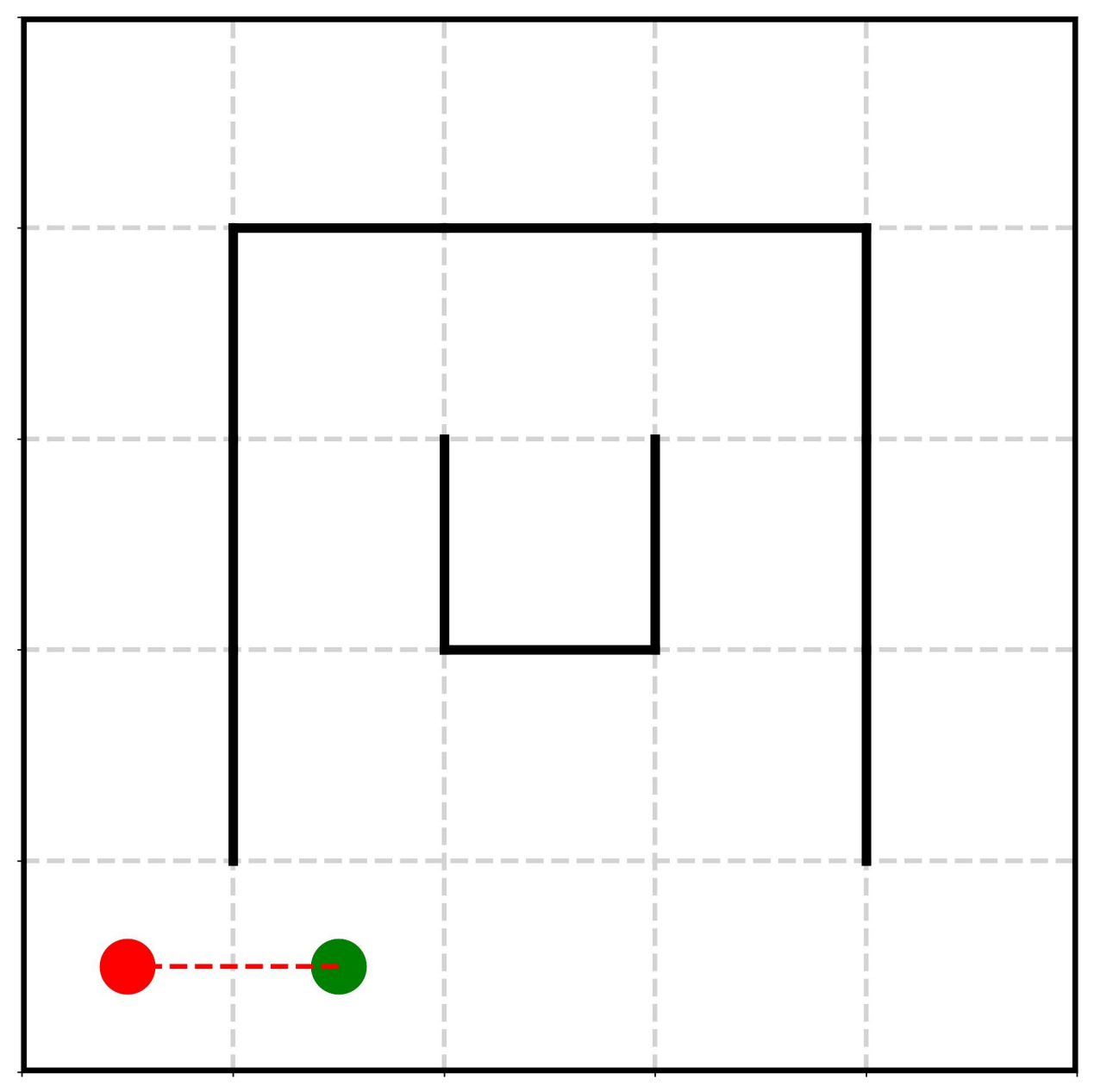

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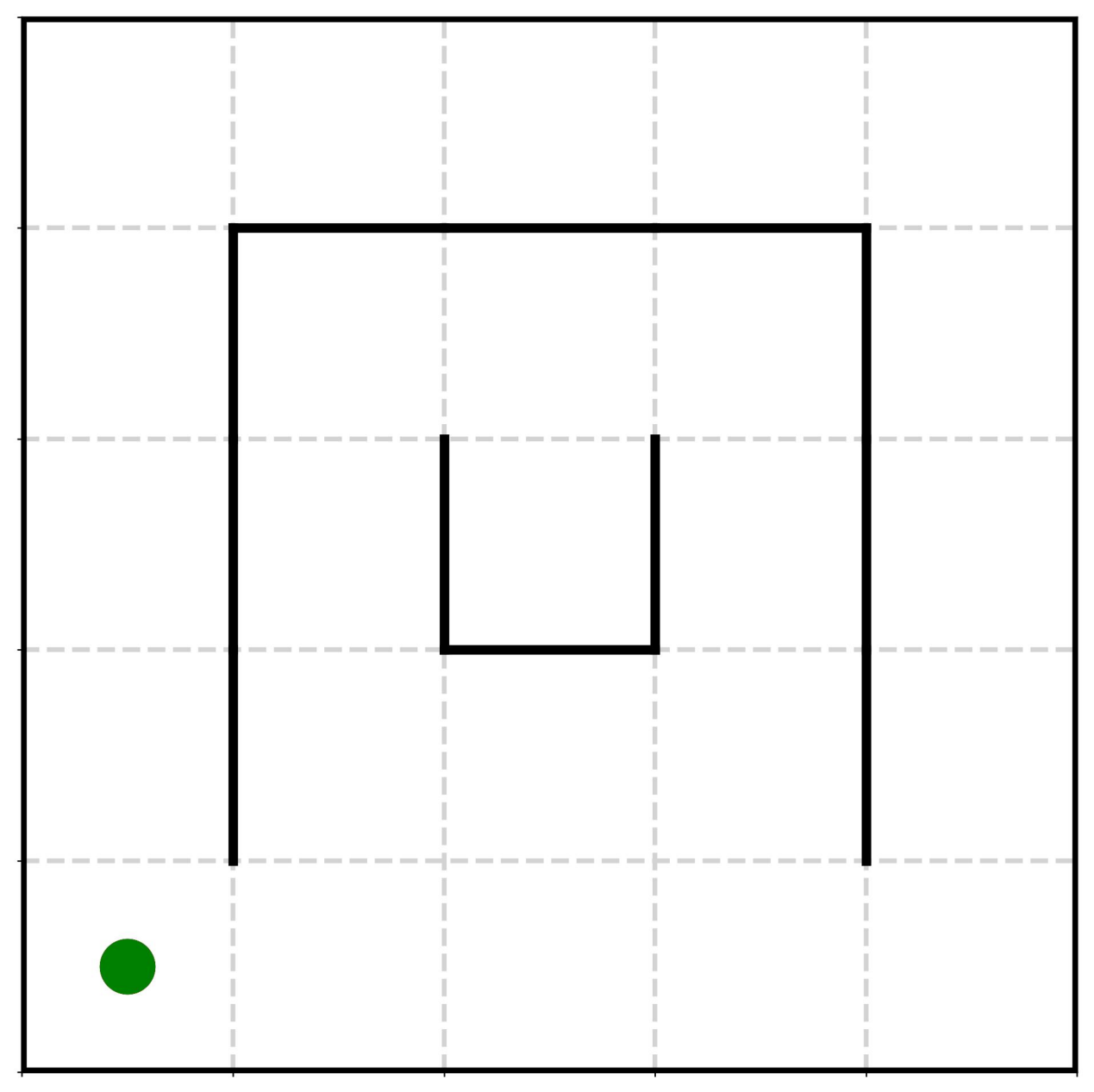

Neodgovorena pitanja

Zašto se ne može desiti da se crveni put od nekog trenutka nikako ne smanji (znamo da se ne može povećati, ali zašto se mora smanjiti)?

Orginalni tekst zadatka (Kanada 2012 - 4)

A number of robots are placed on the squares of a finite, rectangular grid of squares. A square can hold any number of robots. Every edge of each square of the grid is classified as either passable or impassable. All edges on the boundary of the grid are impassable. A move consists of giving one of the commands up, down, left or right. All of the robots then simultaneously try to move in the specified direction. If the edge adjacent to a robot in that direction is passable, the robot moves across the edge and into the next square. Otherwise, the robot remains on its current square.

Suppose that for any individual robot, and any square on the grid, there is a finite sequence of commands that will move that robot to that square. Prove that you can also give a finite sequence of commands such that all of the robots end up on the same square at the same time.