

# Problem-Solving with Karel

# Announcements

- Programming Assignment #1 Out:
  - Karel the Robot: Due Friday, January 20 at 3:15 PM
  - Email: Due Sunday, January 22 at 11:59PM
- Sign up for section!

**<http://cs198.stanford.edu/section>**

Signups close this Sunday at 5PM.

# Friday Four Square



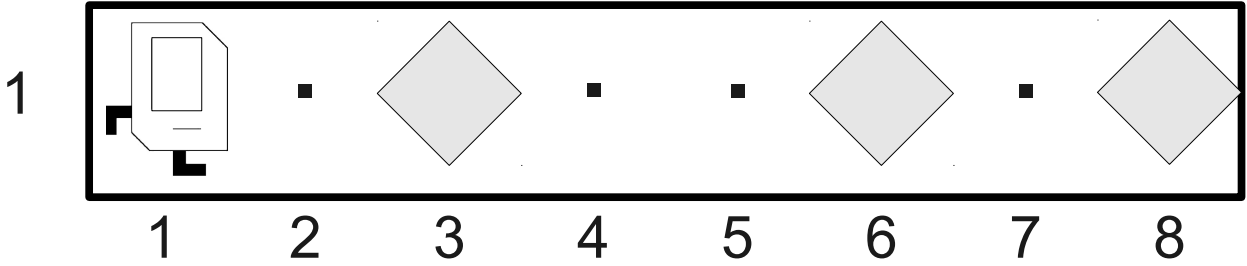
- Good snacks!
- Good company!
- Good game!
- Good fun!
- **Today at 4:15  
in front of  
Gates.**

Don't be this guy!

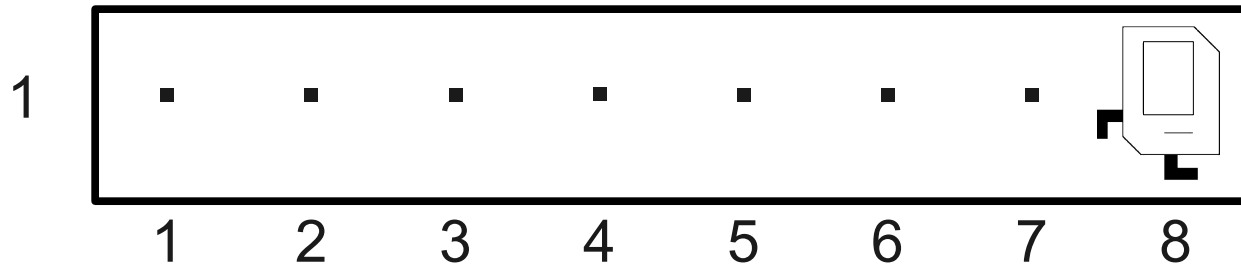
Revisiting HurdleJumpingKarel

**RowSweepingKarel**

# Before



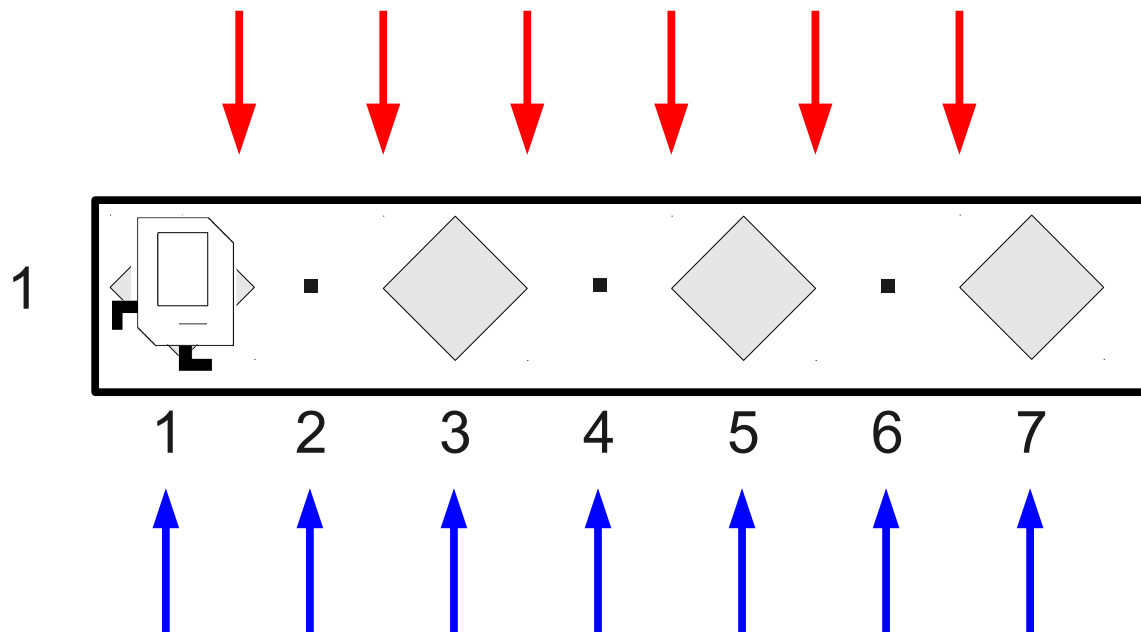
# After



Let's Code it Up!

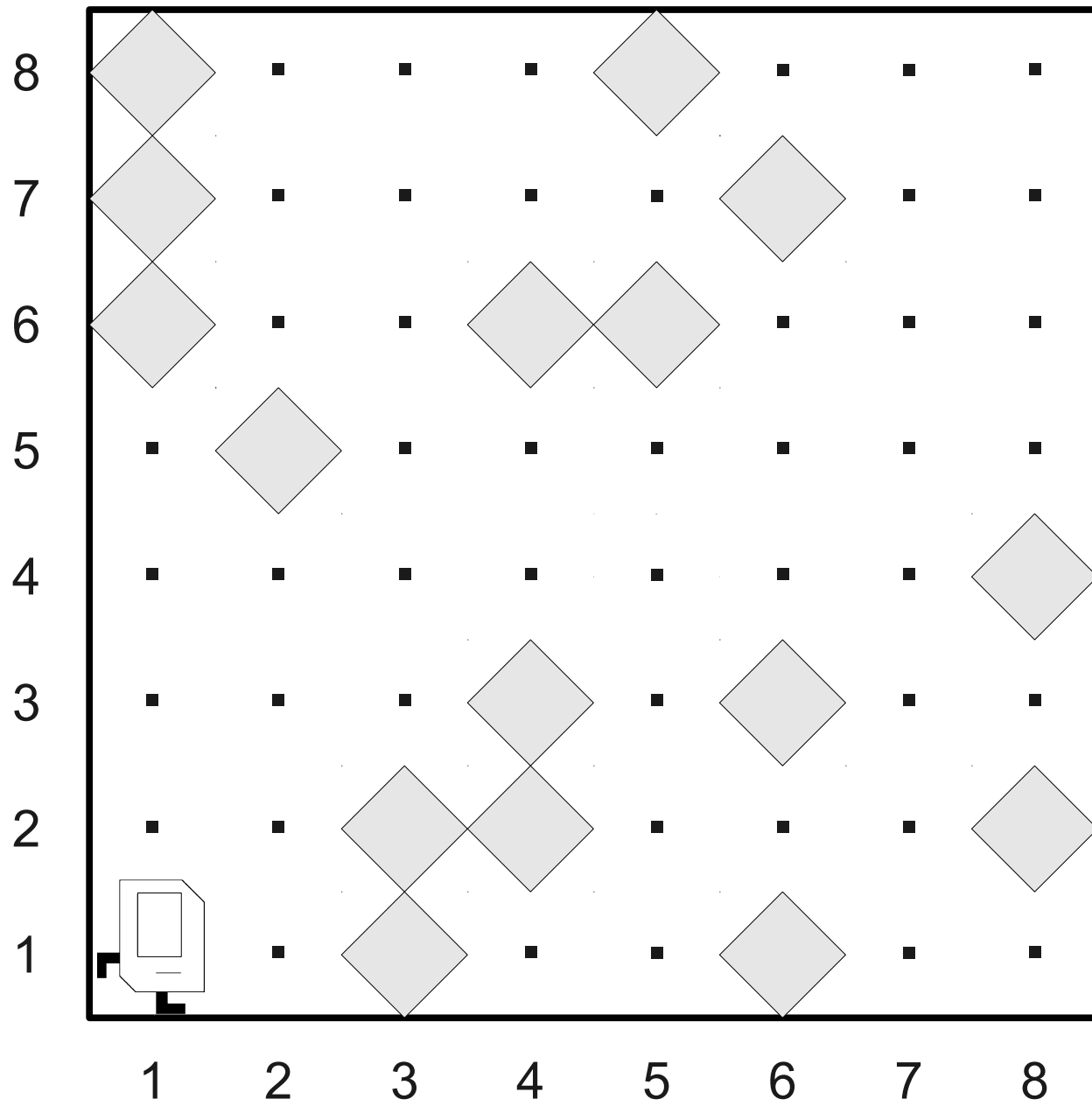


Karel has to take six steps...



...but has to sweep seven corners.

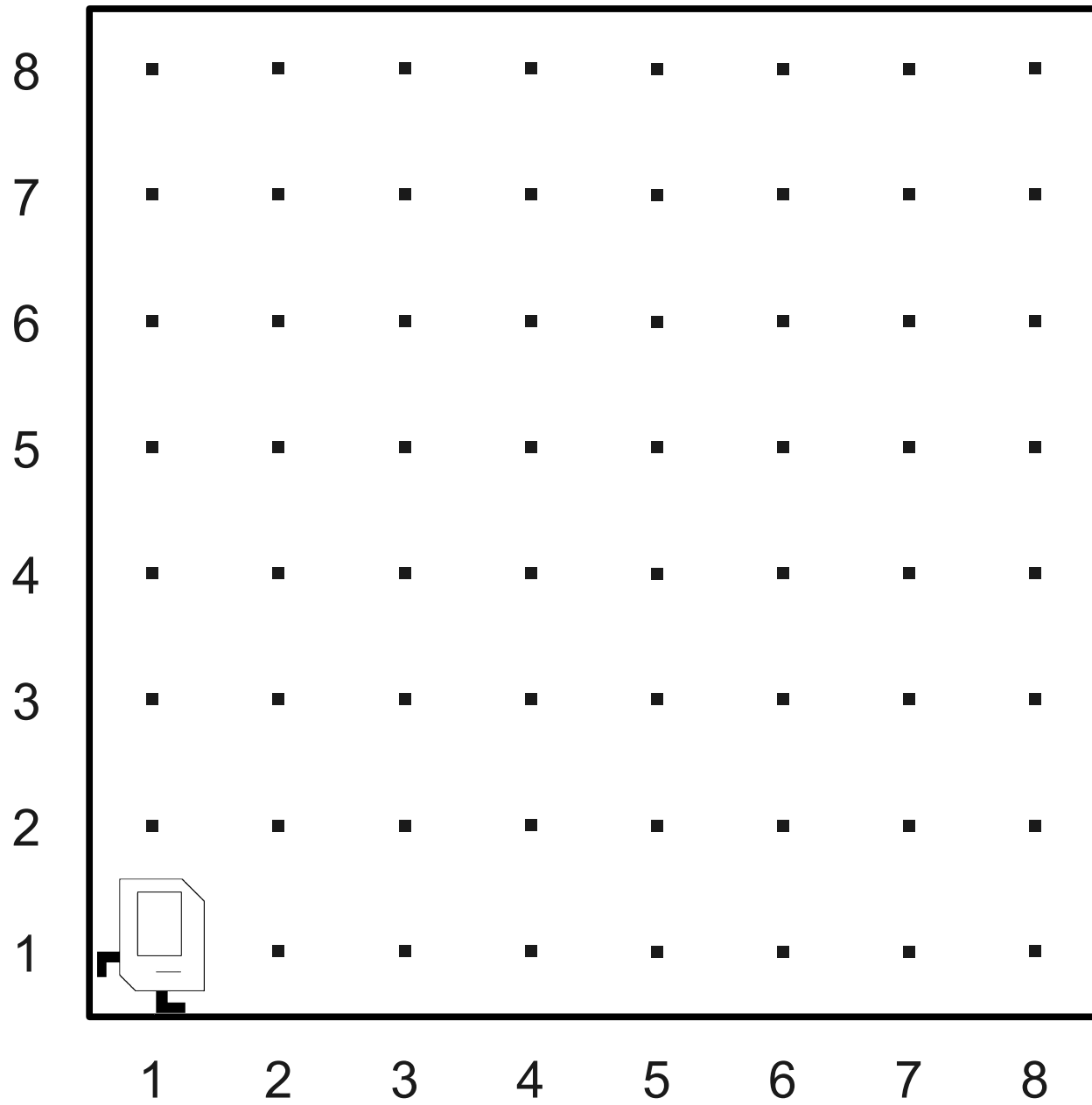
# A More Elaborate Problem

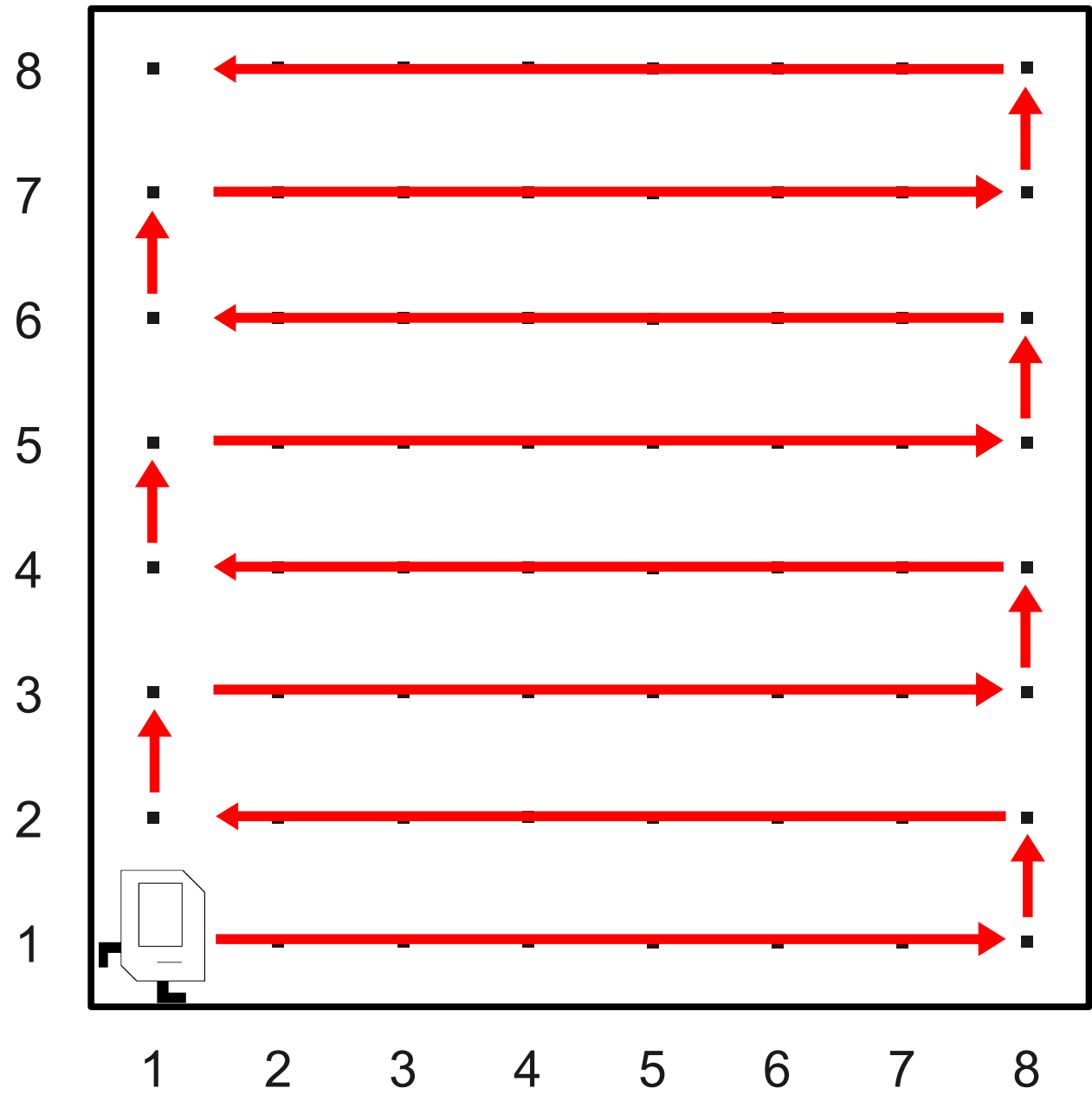


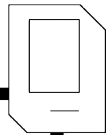
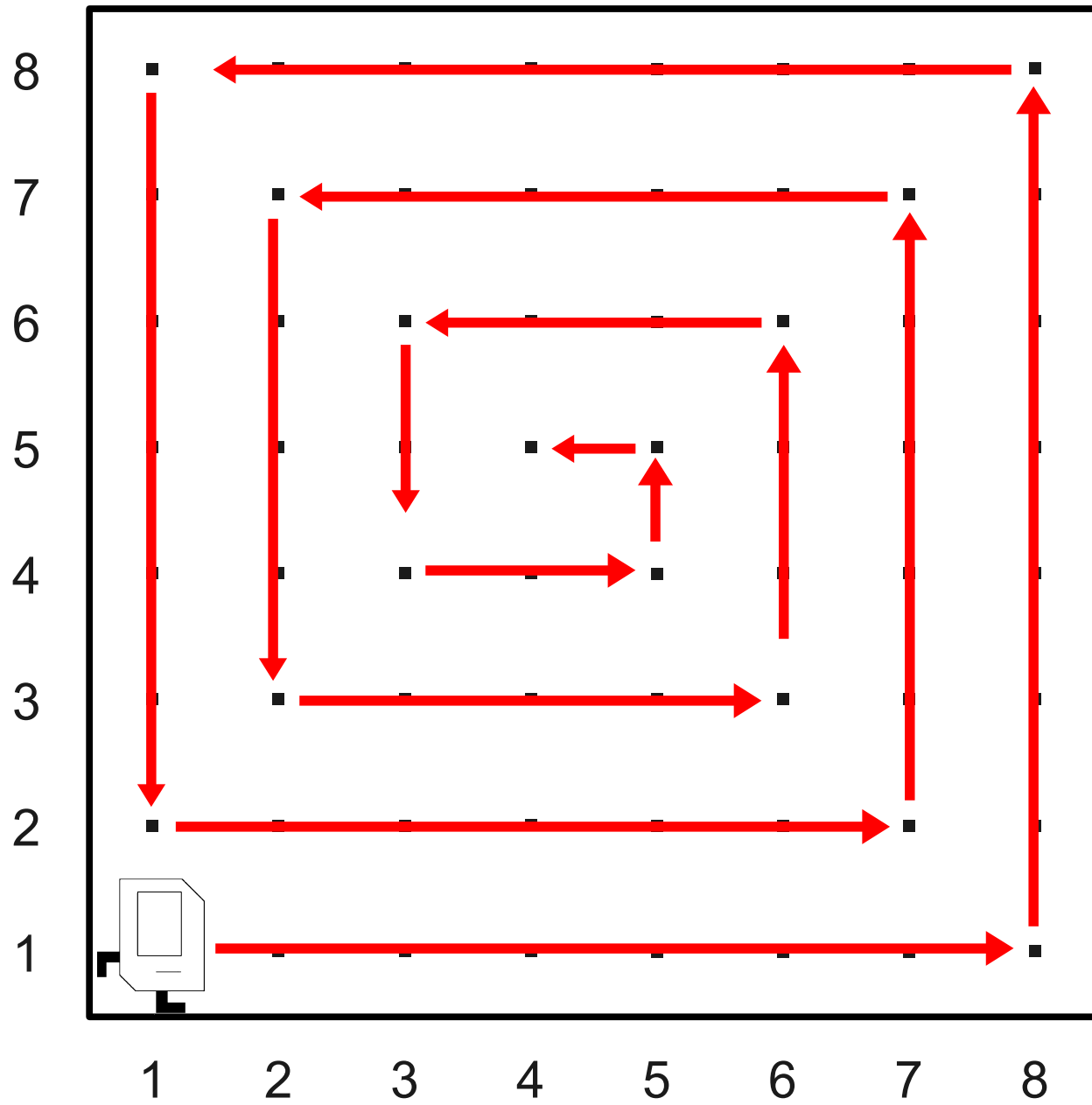
**RoombaKarel**

# The Problem

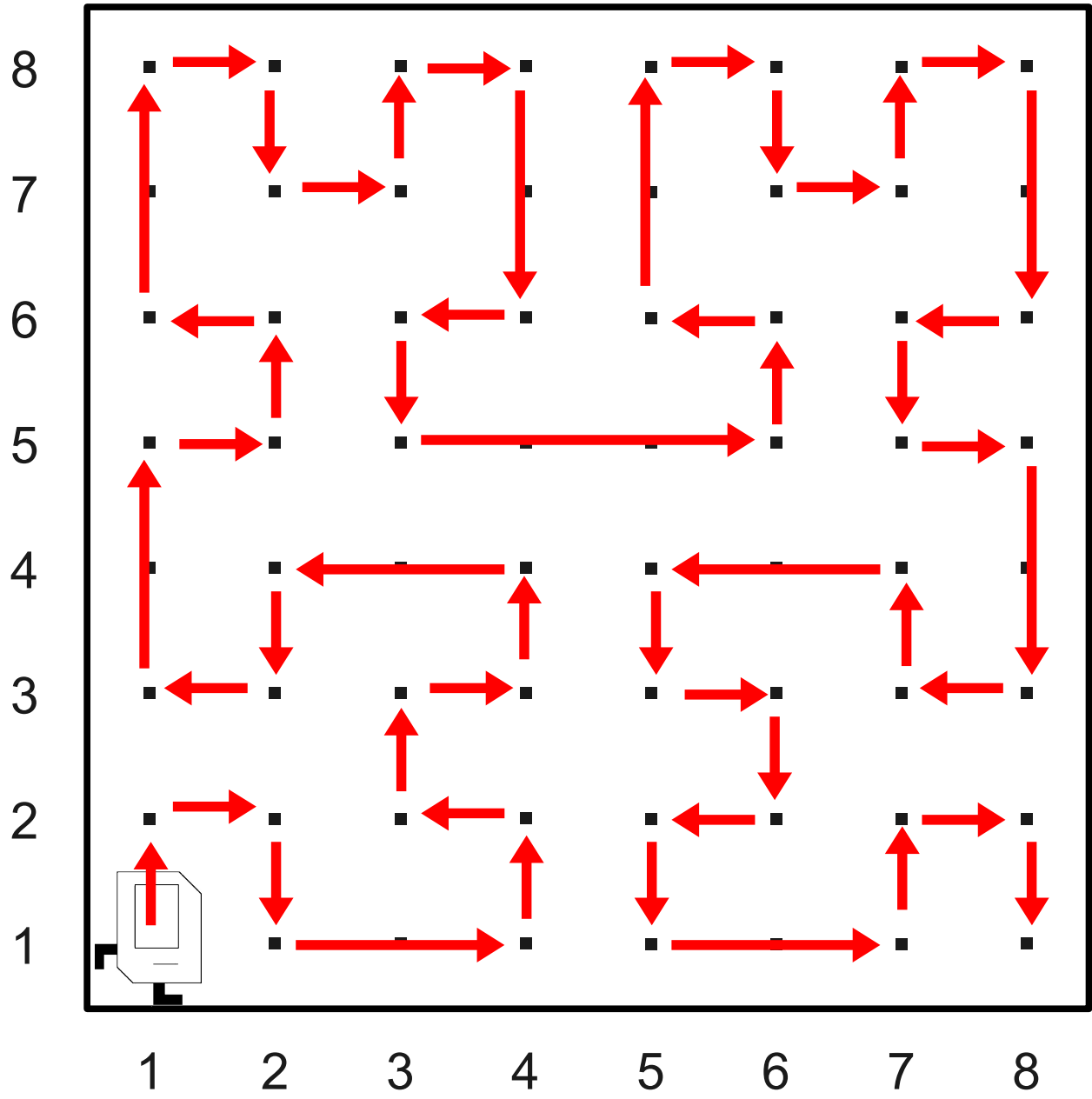
- Setup:
  - Karel begins at (1, 1).
  - Karel's world has no walls in it.
  - Each corner has zero or one beepers.
- Goal:
  - Karel's world is free of beepers.
  - Karel's location does not matter.

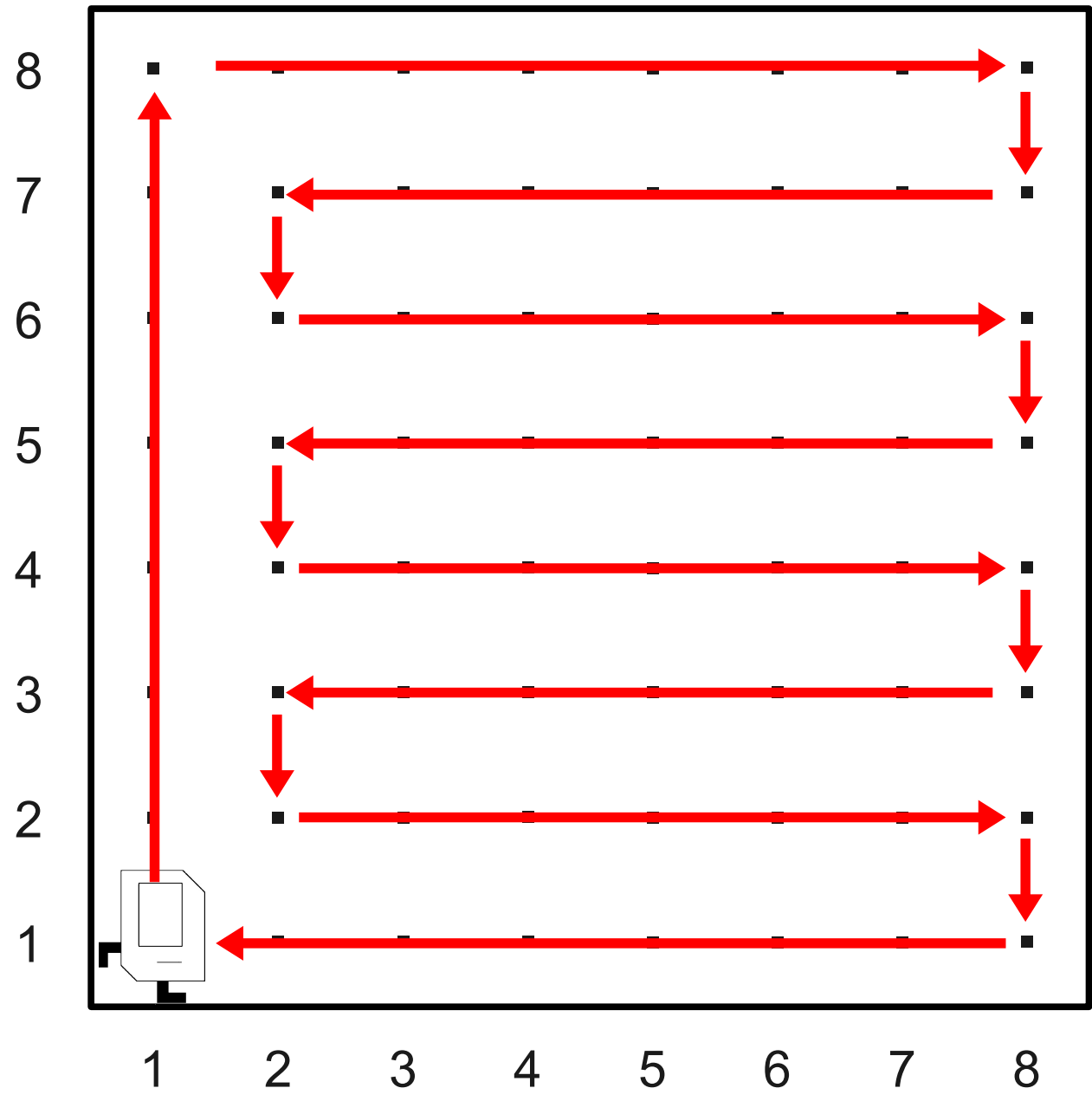






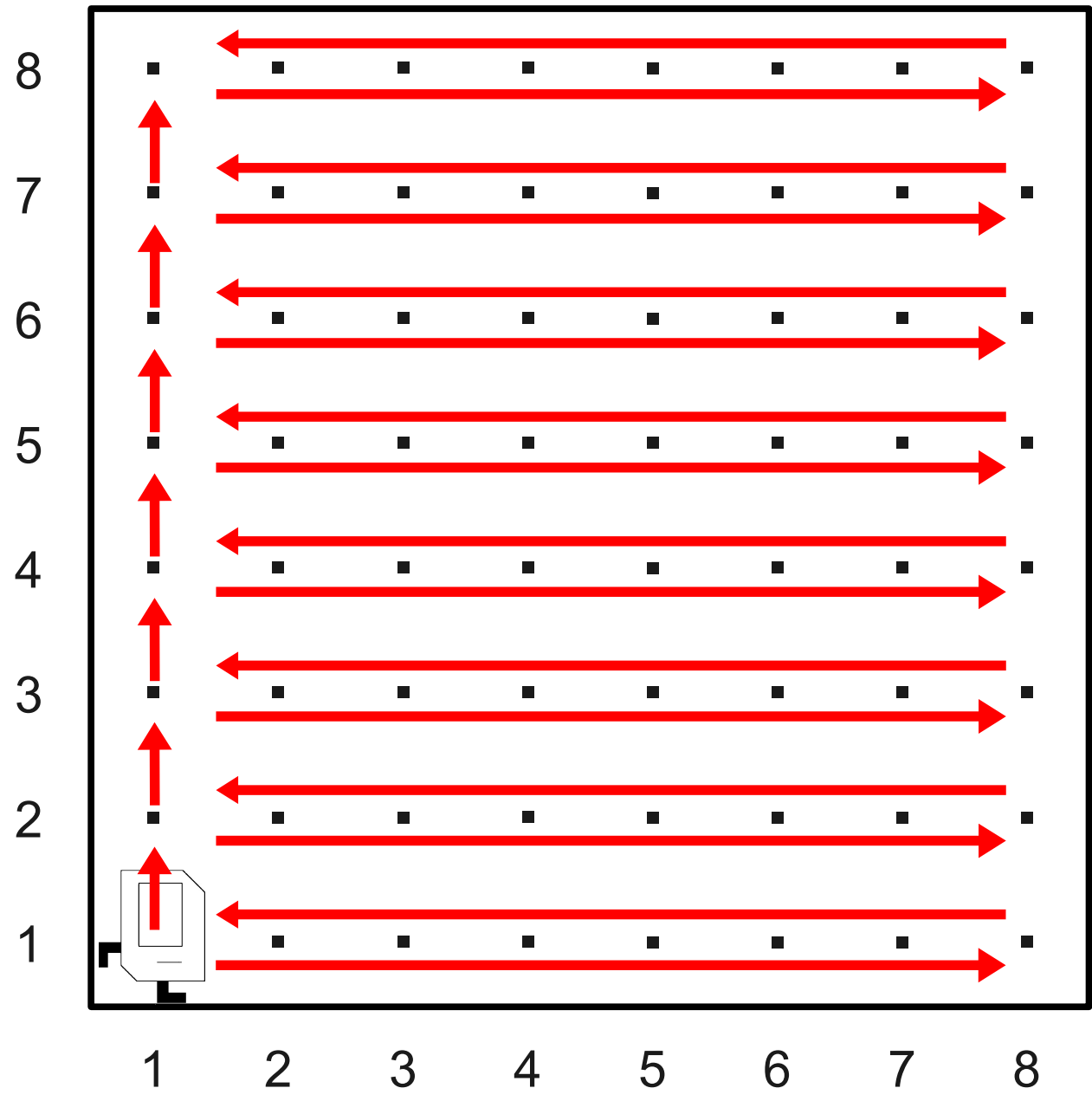






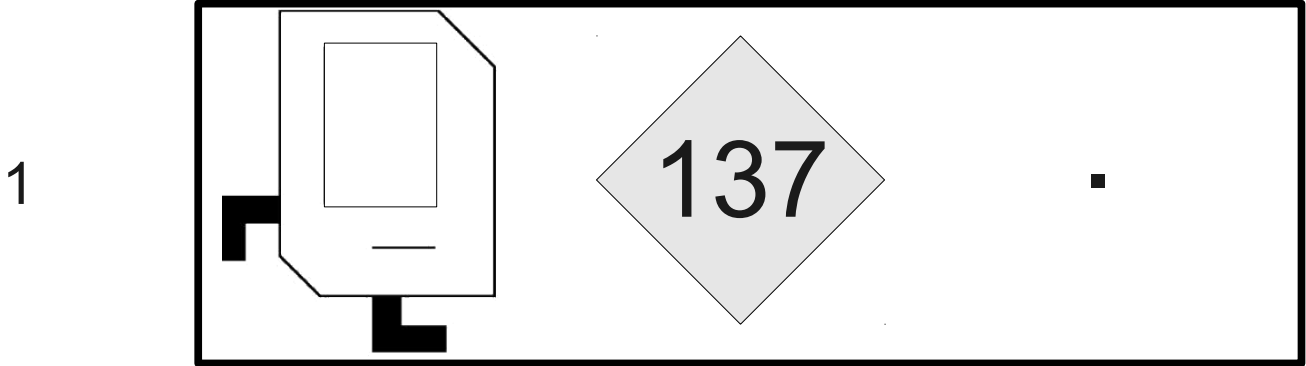
# Algorithms

- An **algorithm** is a process for solving some problem.
- Named for 9th-century Persian mathematician محمد بن موسى الخوارزمي, (Muhammad ibn Musa **al-Khwarizmi**).
- There are many algorithms for solving each problem; each offers tradeoffs.



**BeeperDoublingKarel**

# Before



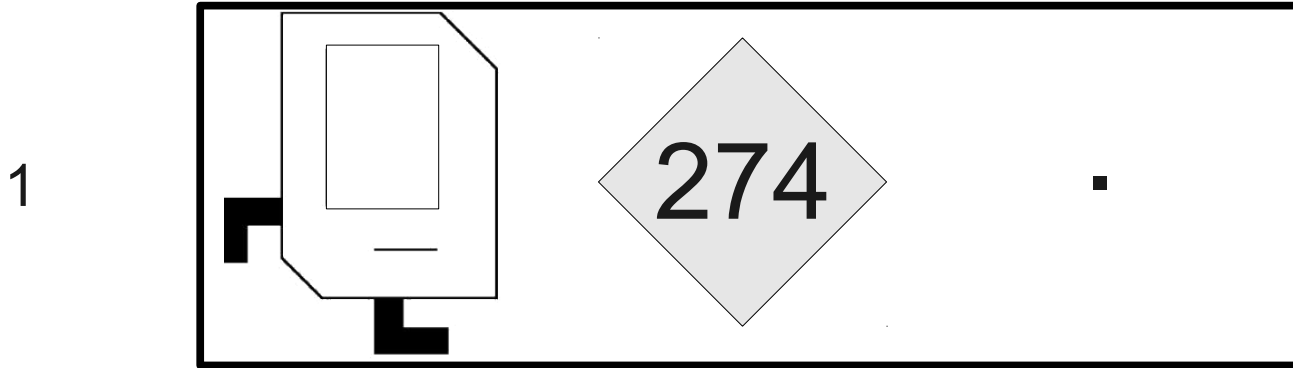
1

1

2

3

# After



1

1

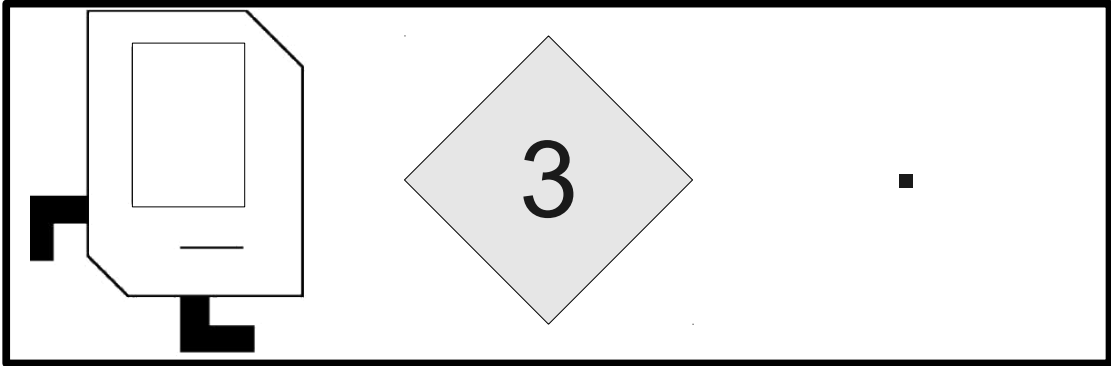
2

3

How do you double beepers?



1

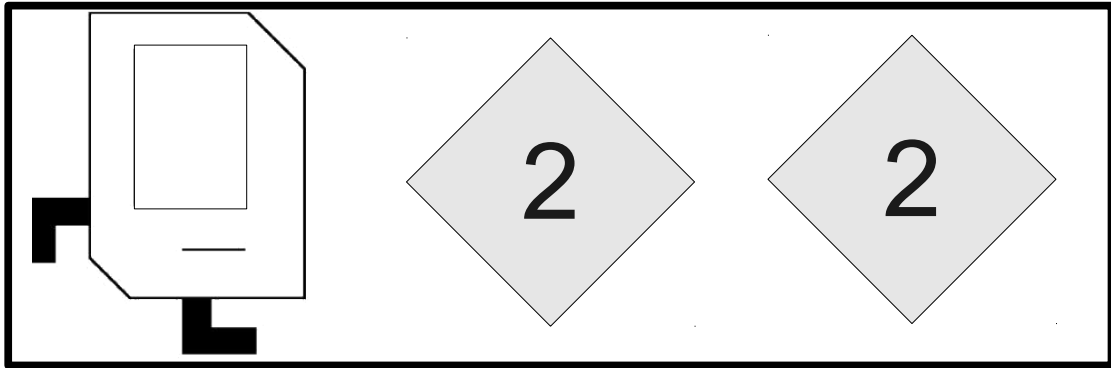


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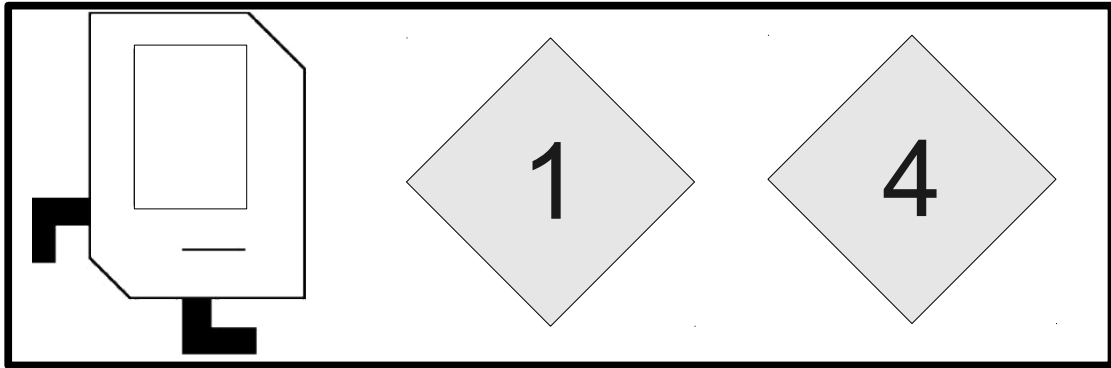


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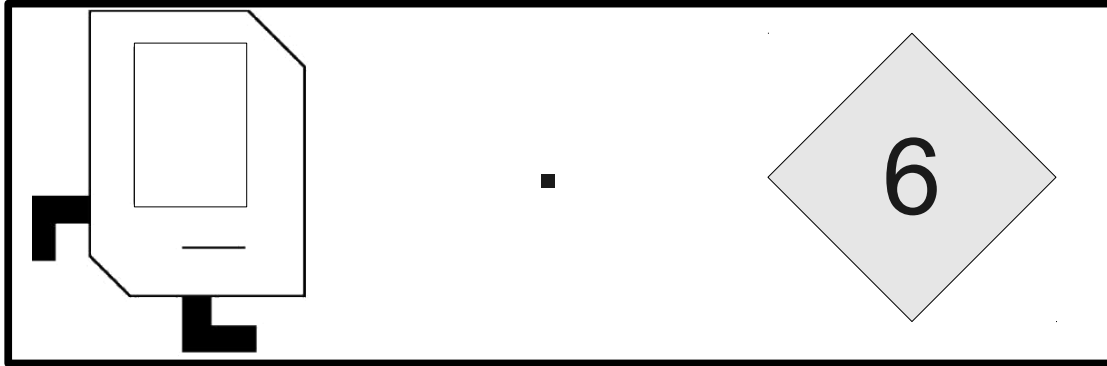


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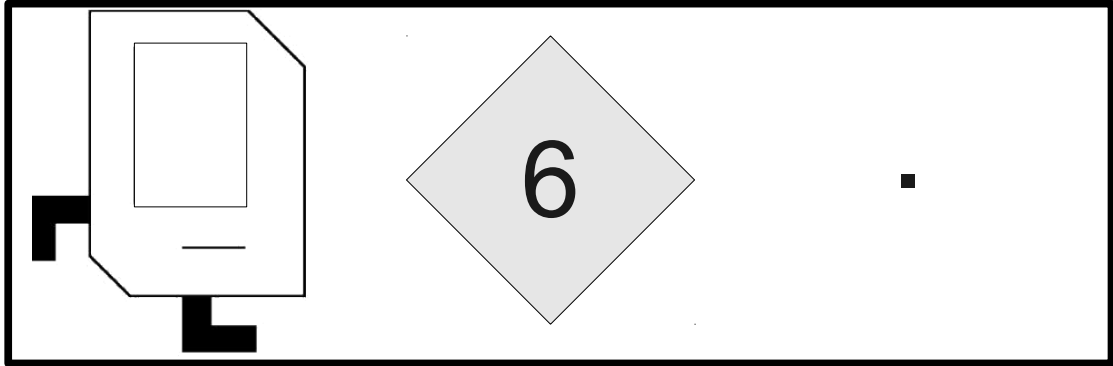


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