

Welcome to CS106A!

- Today:
 - Course Overview
 - Why Learn to Program?
 - Meet Karel the Robot

Who's Here Today?

- Applied Physics
- Art History
- Art Studio
- Biology
- Biomedical Informatics
- Biophysics
- Business Administration
- Civil/Environmental Engineering
- Classics
- Chemical Engineering
- Communication
- Comparative Race and Ethnicity
- Earth Systems
- Economics
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- Linguistics
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- Materials Science
- Math and Computational Sciences
- Mathematics
- Mechanical Engineering
- Medicine
- Modern Languages
- MS&E
- Music
- Political Science
- Physics
- Psychology
- Sociology
- Science, Technology, and Society
- Slavic Languages and Literature
- Statistics
- Symbolic Systems
- Theater and Performing Arts
- **Undeclared!**
- Urban Studies

Course Staff

Instructor: Keith Schwarz
(htiek@cs.stanford.edu)

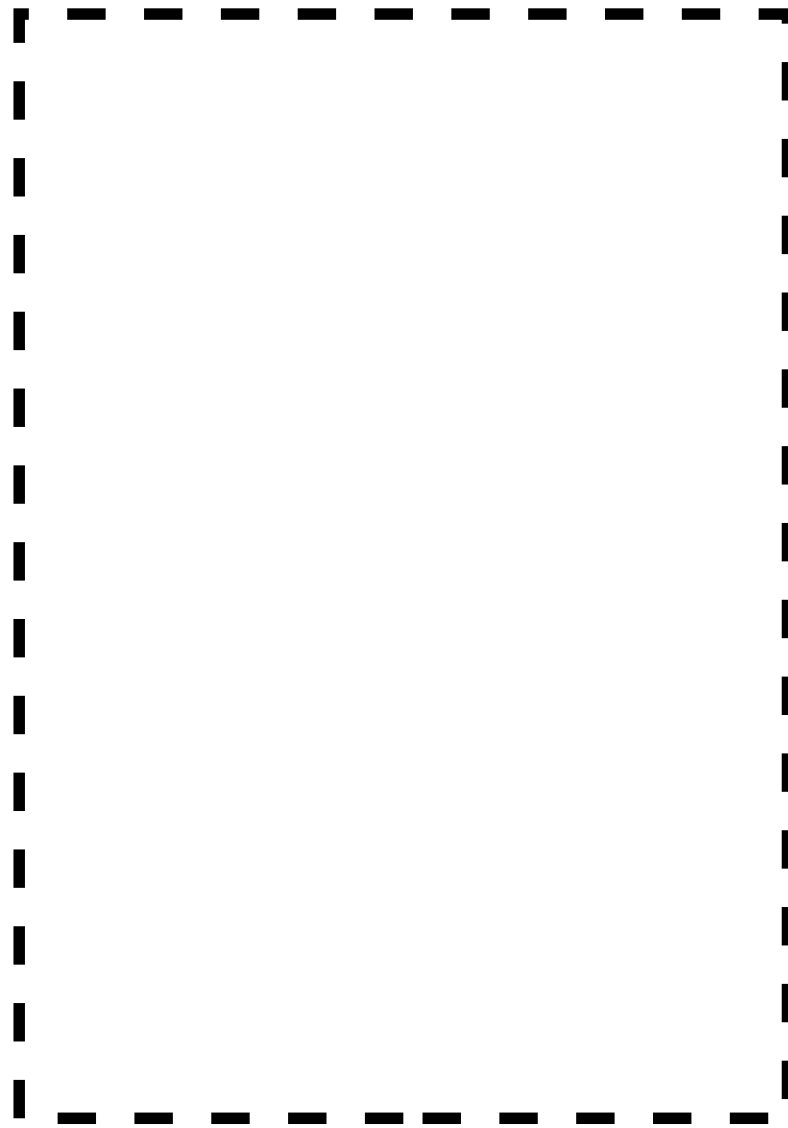
Head TA: Vikas Yendluri
(vikasuy@cs.stanford.edu)

The CS106A Section Leaders
The CS106A Course Helpers

Course Website

<http://cs106a.stanford.edu>

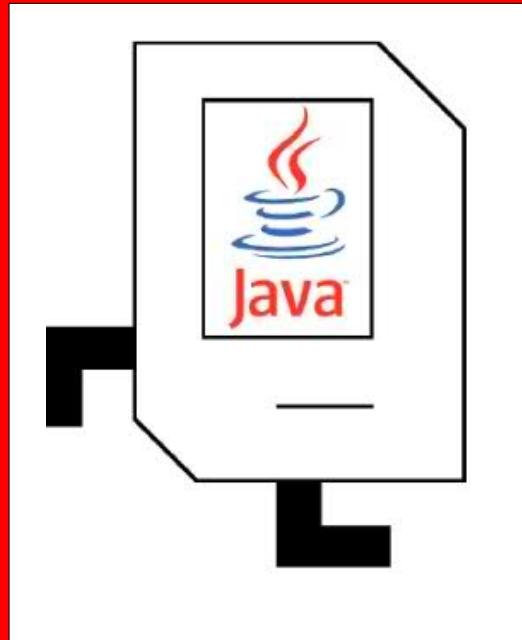
Prerequisites



The void where
prerequisites
usually go

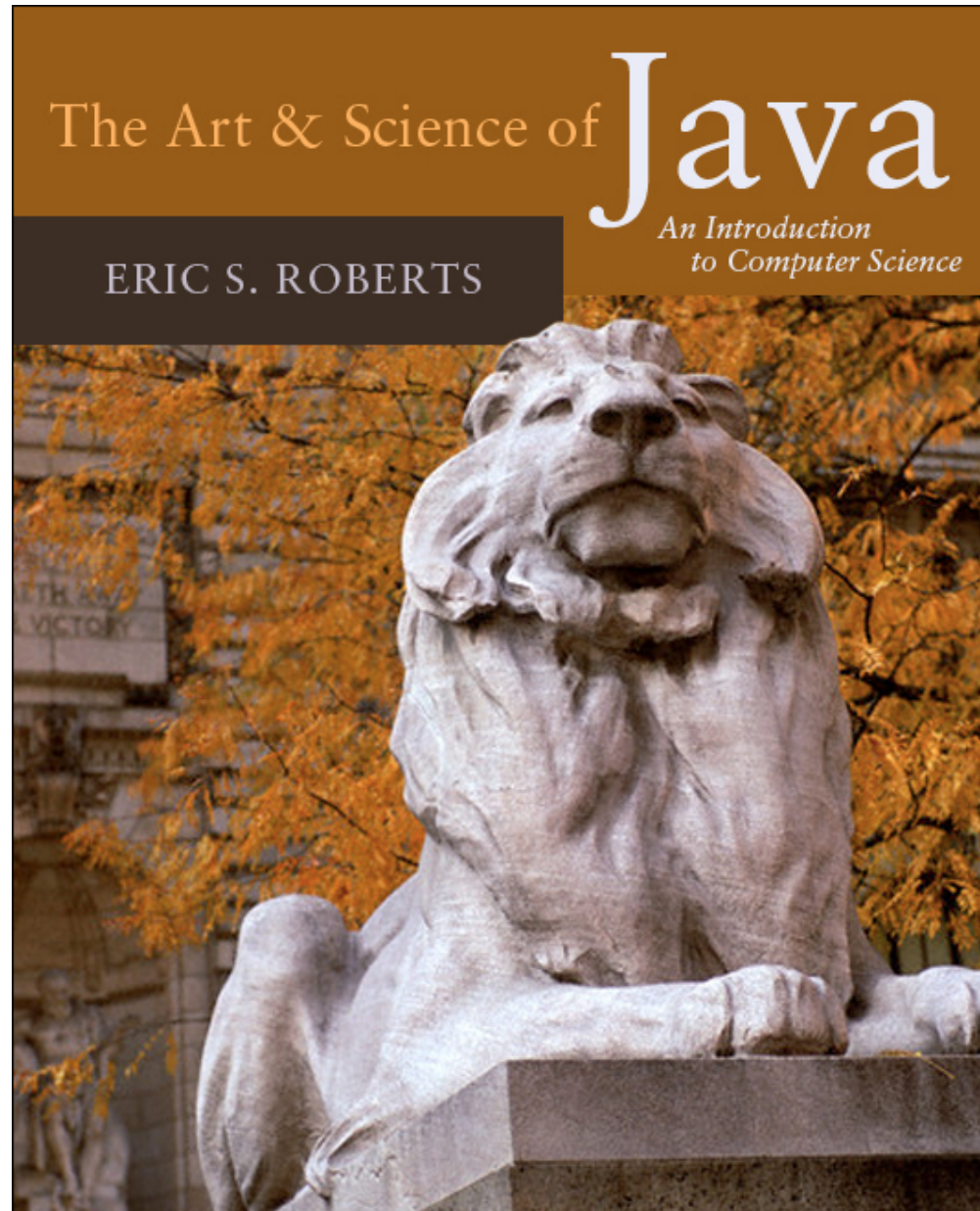
Required Reading

KAREL THE ROBOT



LEARNS JAVA

Required Reading

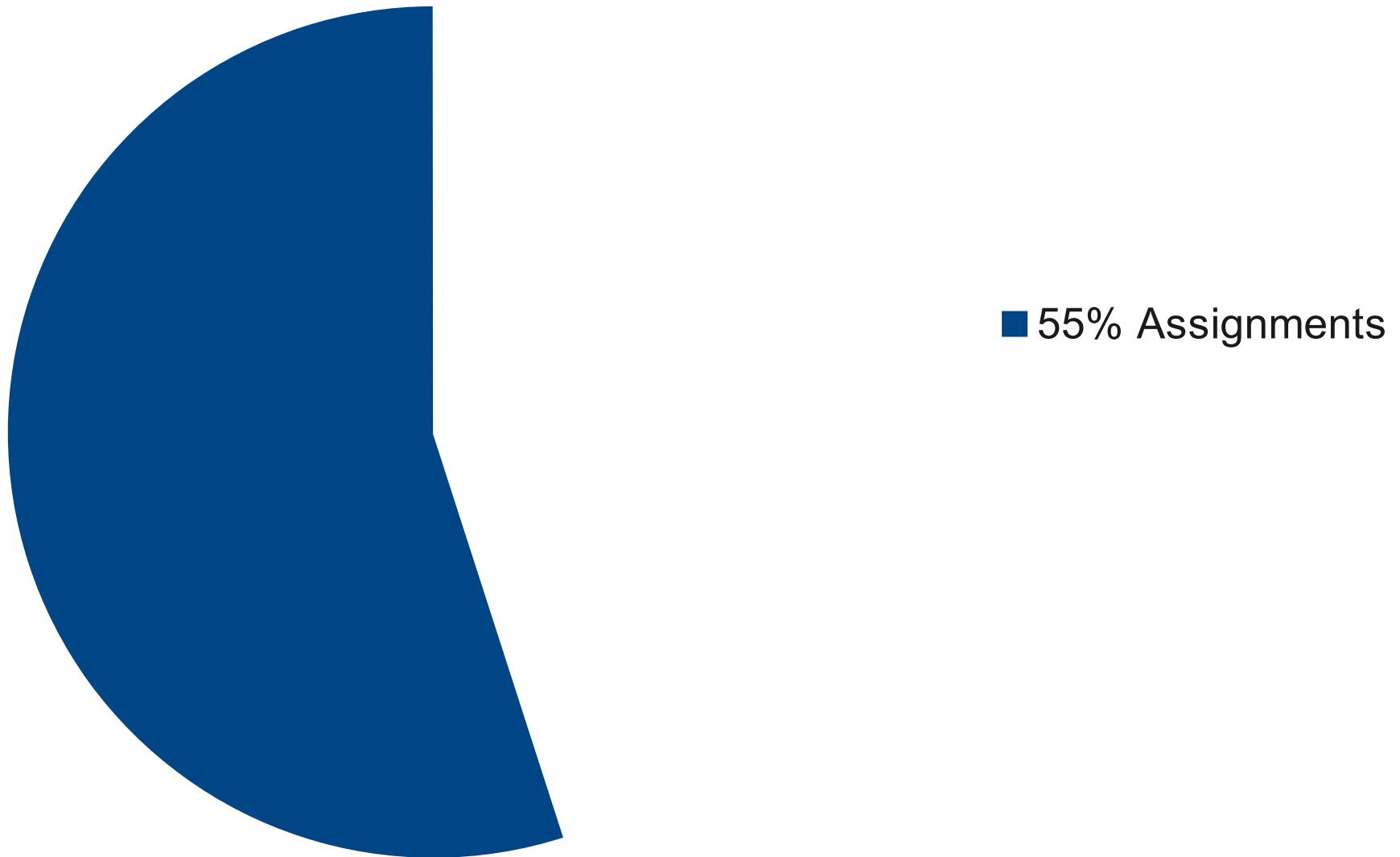


Handouts

- In addition to the other readings, we'll distribute handouts from time to time.
- ***There are over 600 people in this course!*** To avoid deforesting the Amazon, handouts for today are online.
 - Course information, course placement, and syllabus.
- We'll send out a survey for future handouts to get a sense of how many to print.

Grading Policies

Grading Policies



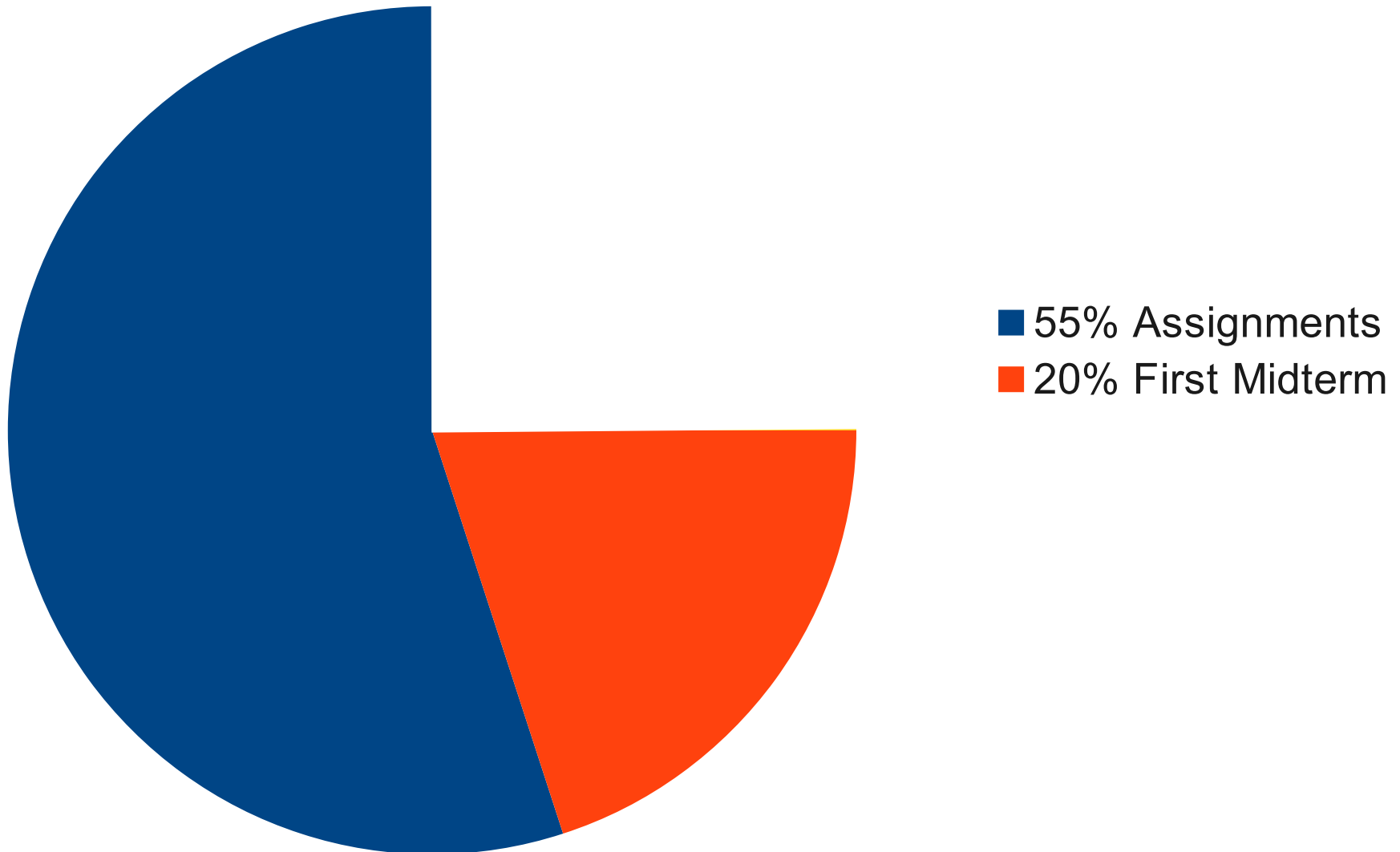
Grading Policies



■ 55% Assignments

Seven Programming
Assignments

Grading Policies



Grading Policies



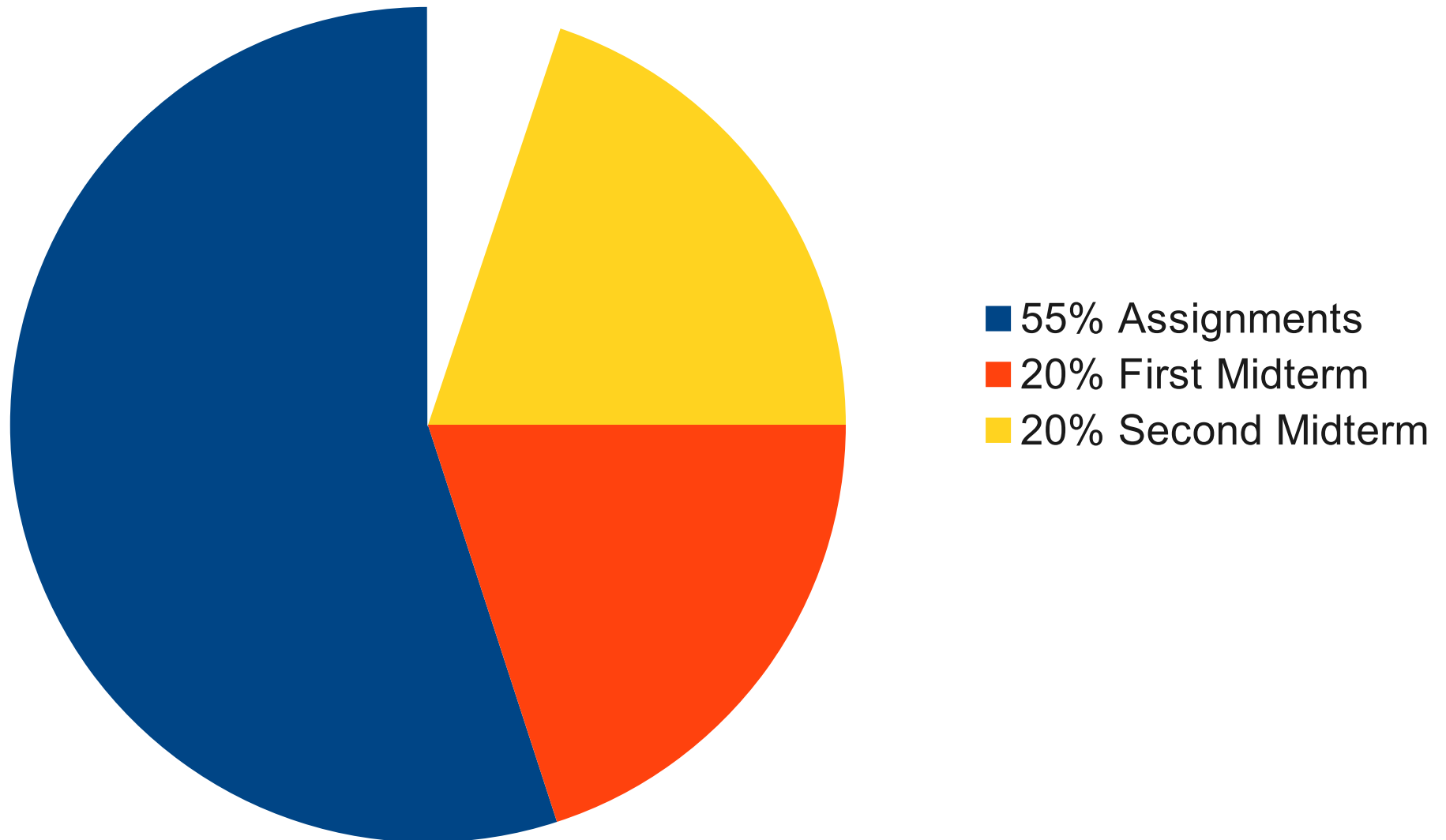
■ 55% Assignments

■ 20% First Midterm

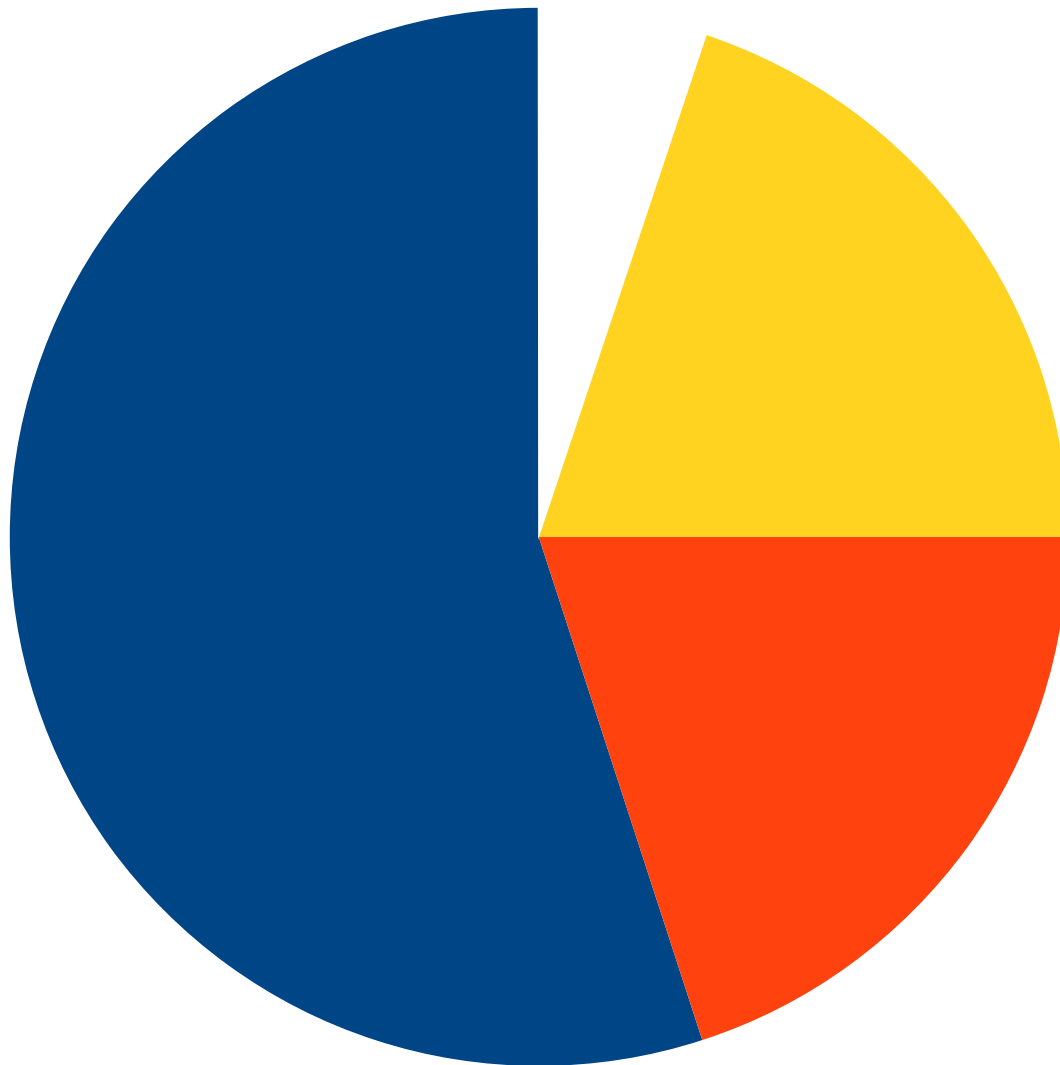
First Midterm Exam

**Wednesday,
February 12
7PM - 10PM**

Grading Policies



Grading Policies

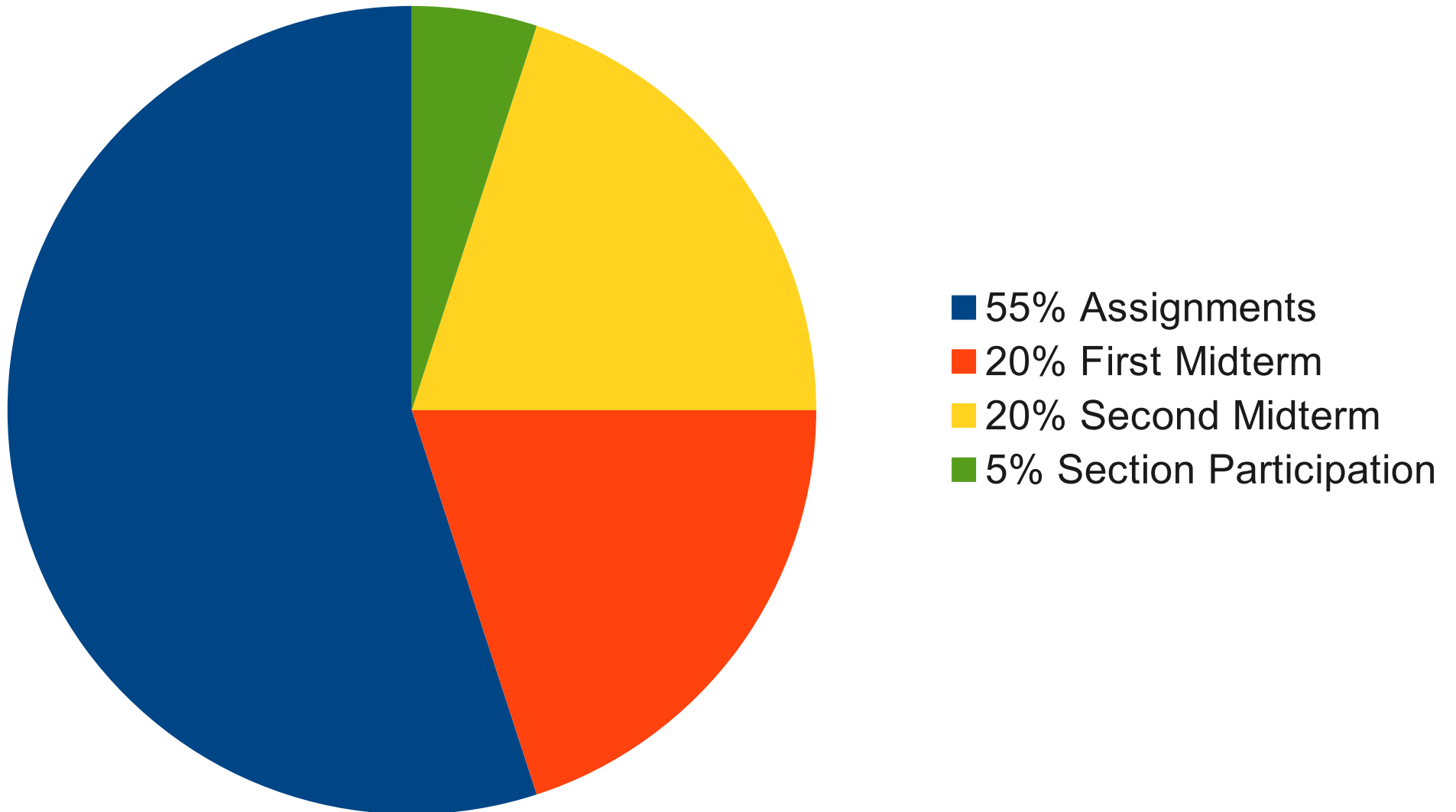


- 55% Assignments
- 20% First Midterm
- 20% Second Midterm

Second Midterm Exam

**Wednesday,
March 5
7PM - 10PM**

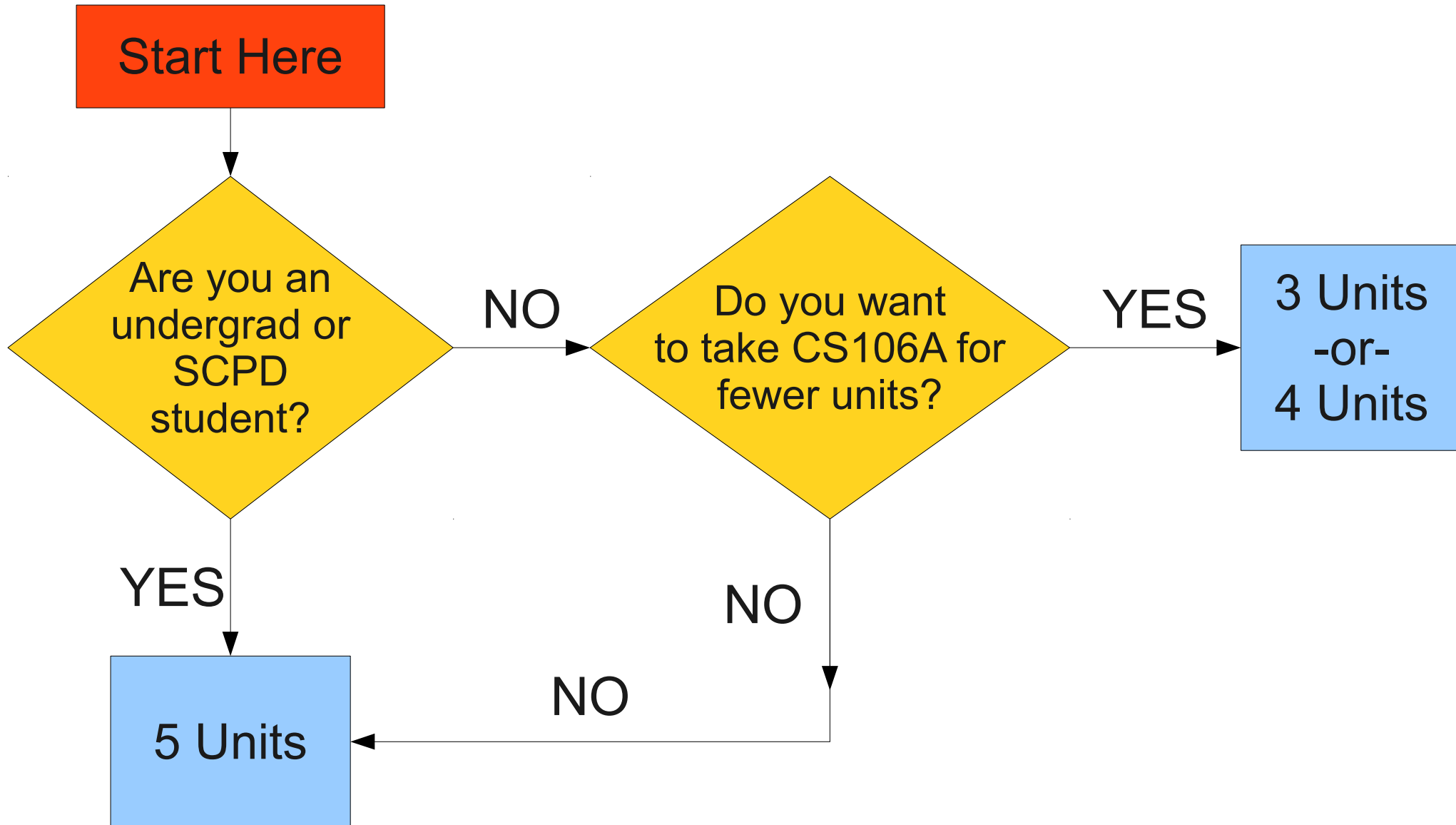
Grading Policies



Discussion Sections

- Weekly discussion sections.
- Section attendance is **required** in CS106A.
- Sign up between Thursday, January 9 at 5:00PM and Sunday, January 12 at 5:00PM at **<http://cs198.stanford.edu/section>**
- Don't worry about signing up for a section on Axxess; everything is handled through the above link.

The CS106A Units Flowchart





Getting Help

- LaIR Hours!
 - Sunday - Thursday, 6PM - Midnight
 - Starts next week.
- Vikas's Office Hours in Gates 160
 - Tuesday/Thursday, 2:15PM - 4:15PM
- Keith's Office Hours in Gates 178
 - TBA

Why Learn to Program Computers?

Computer science is no more about computers than astronomy is about telescopes, biology is about microscopes or chemistry is about beakers and test tubes. Science is not about tools, it is about how we use them and what we find out when we do.

- Michael Fellows and Ian Parberry,
“SIGACT trying to get children excited about CS”

Computer science is no more about computers than astronomy is about telescopes, biology is about microscopes or chemistry is about beakers and test tubes.

Science is not about tools, it is about how we use them and what we find out when we do.

- Michael Fellows and Ian Parberry,
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Linked **in**.

facebook



twitter

skype™

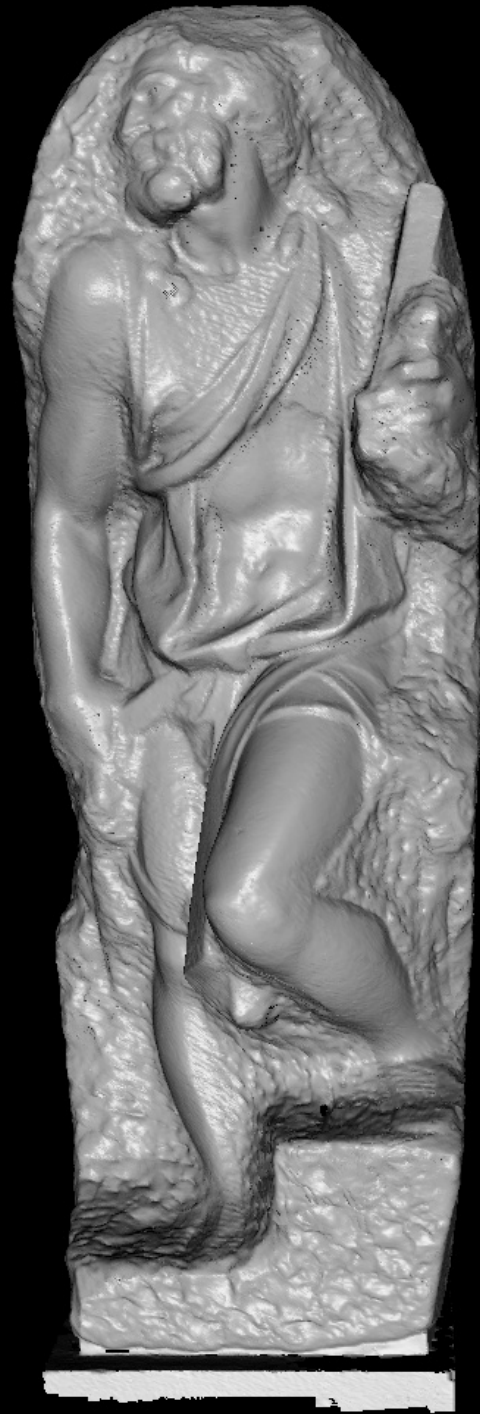


Source: <http://www.npr.org/blogs/alltechconsidered/2012/12/24/167961947/kenyan-women-create-their-own-geek-culture>



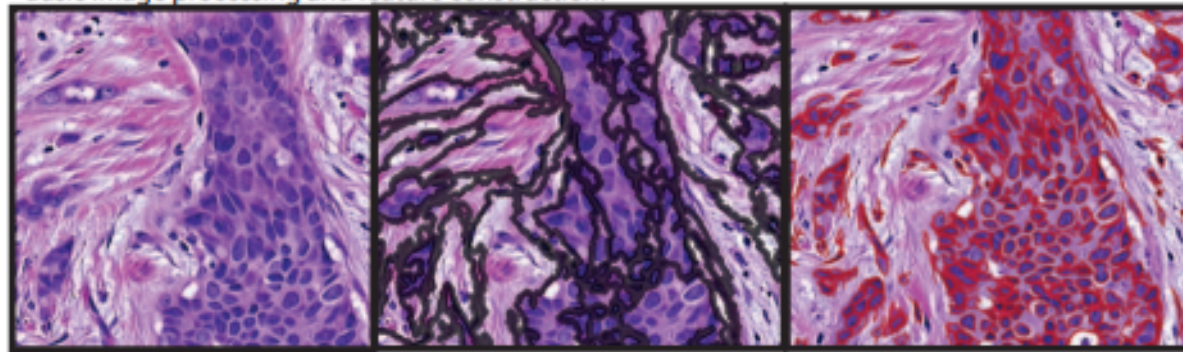
Source: http://alumni.stanford.edu/get/page/magazine/article/?article_id=55993





A

Basic image processing and feature construction:



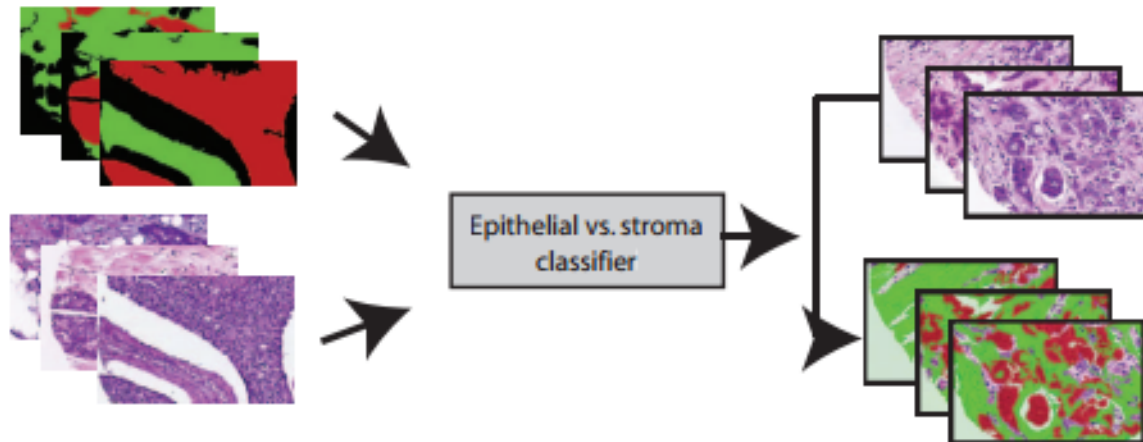
H&E image

Image broken into superpixels

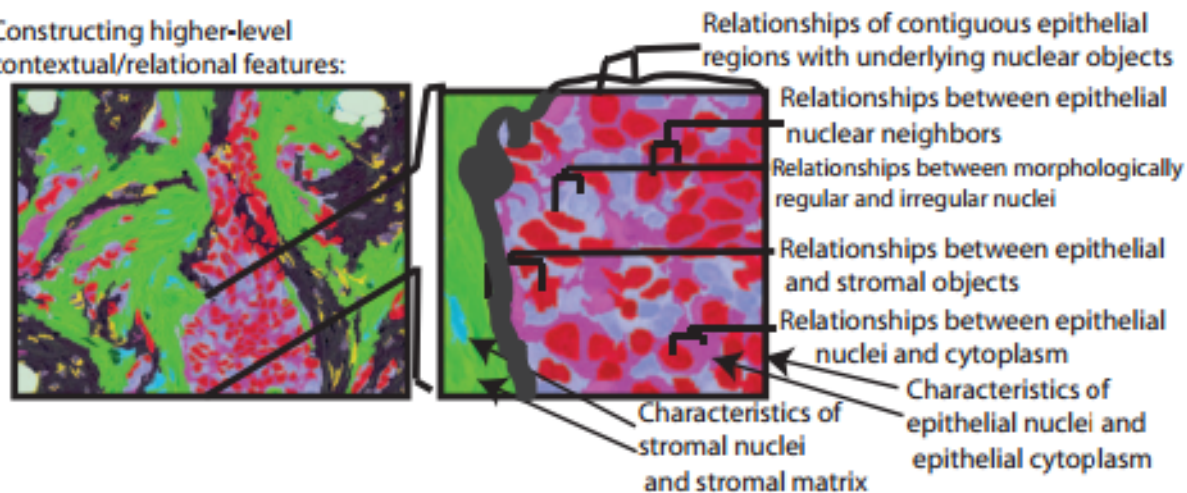
Nuclei identified within each superpixel

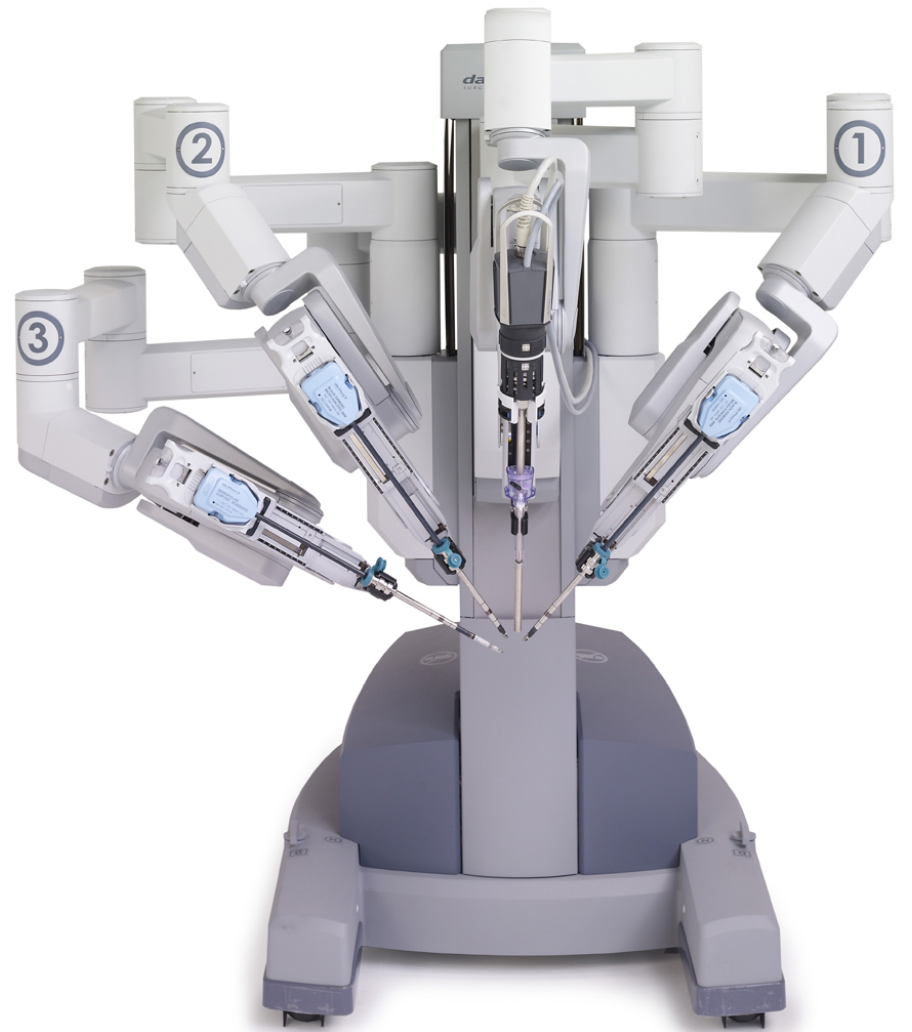
B

Building an epithelial/stromal classifier:

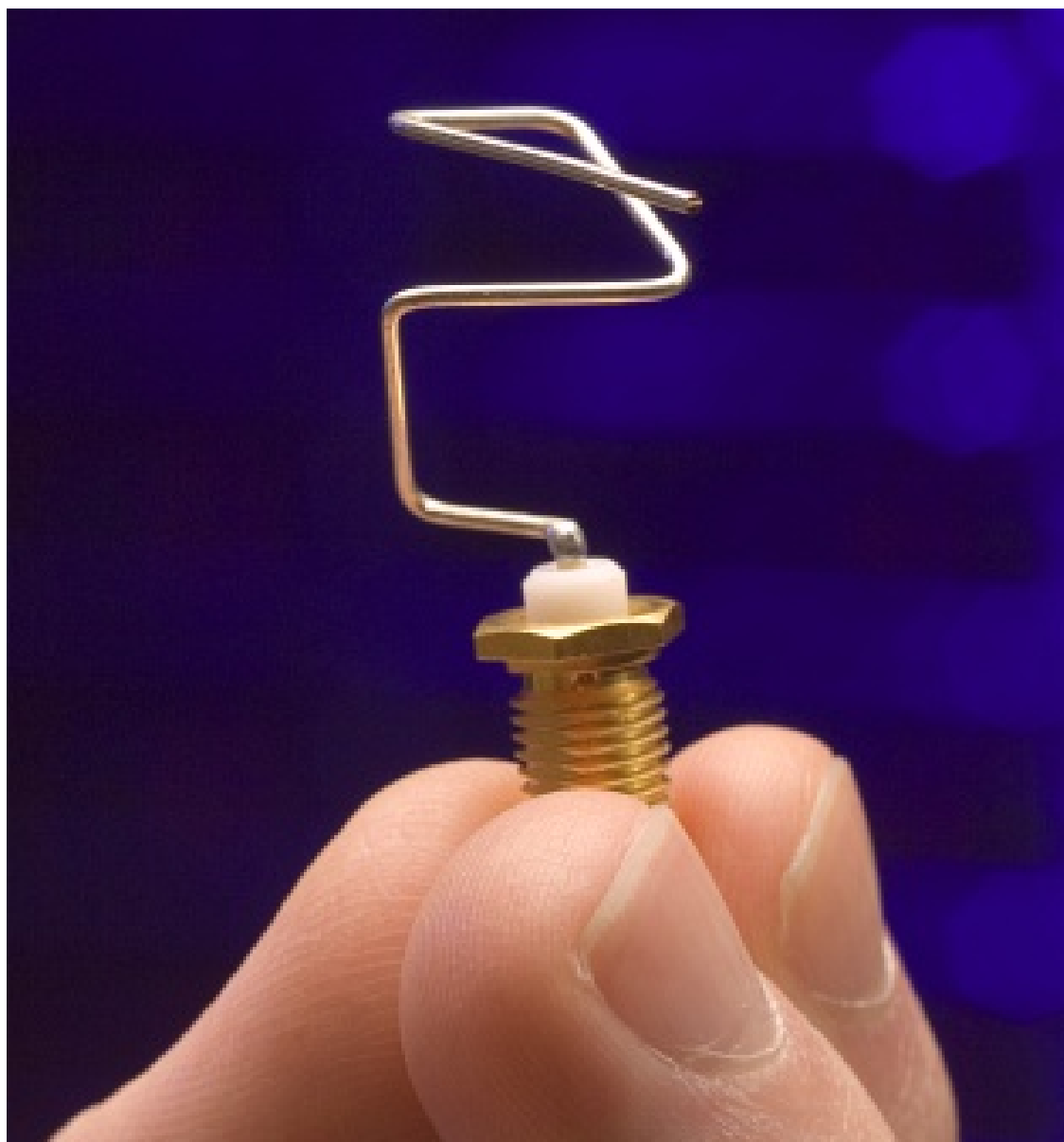
**C**

Constructing higher-level contextual/relational features:











All of these projects occurred
within the last ten years.

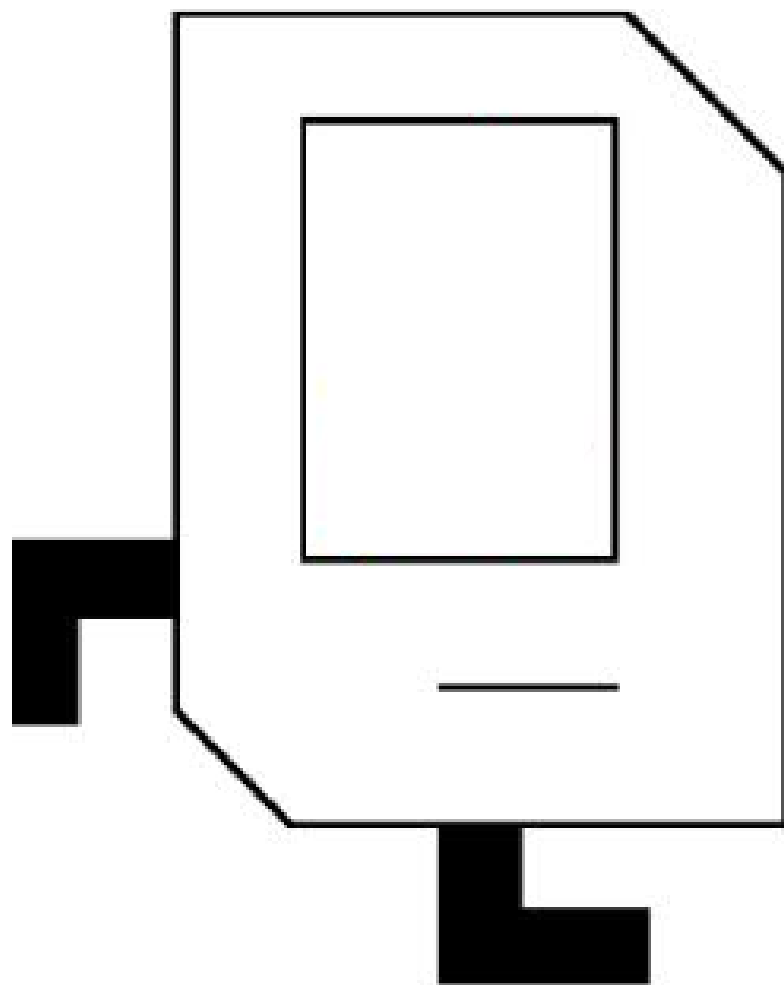
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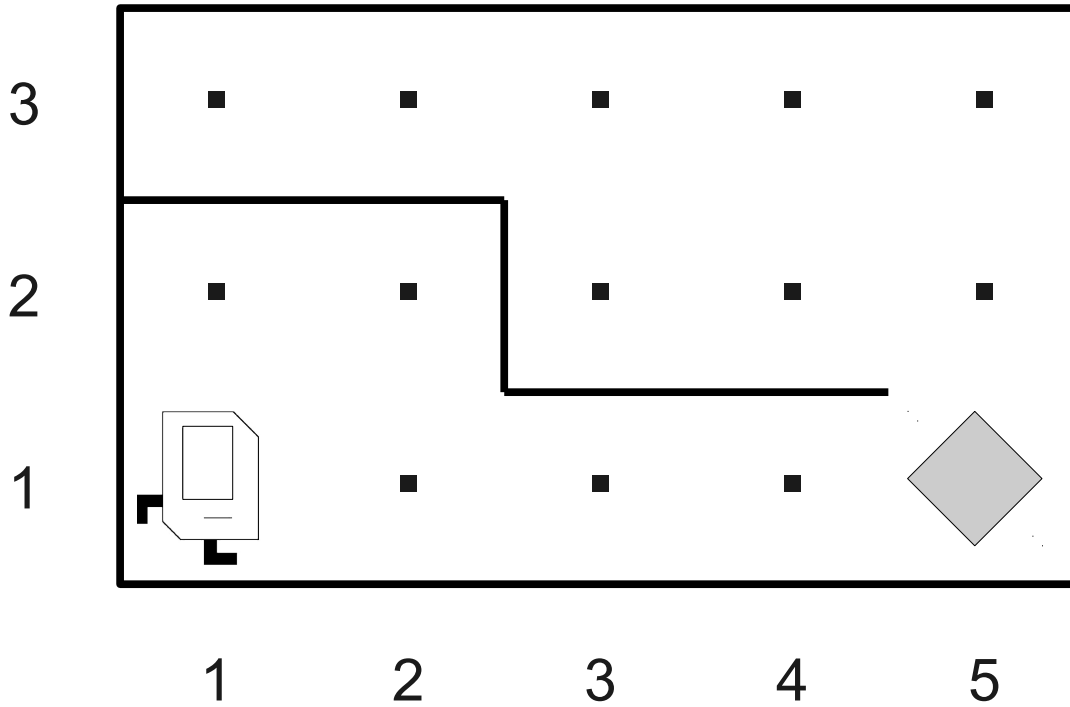
Goals for this Course

- **Learn how to harness computing power to solve problems.**
- To that end:
 - Explore fundamental techniques in computer programming.
 - Develop good software engineering techniques.
 - Gain familiarity with the Java programming language.

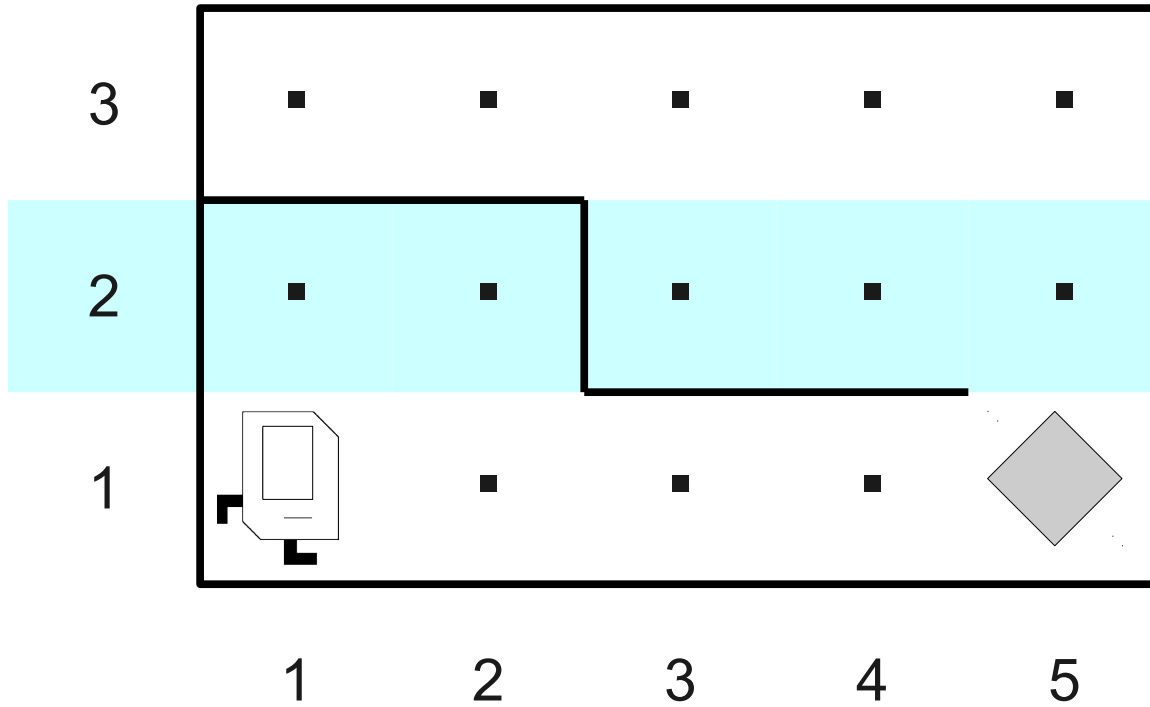
Meet Karel the Robot



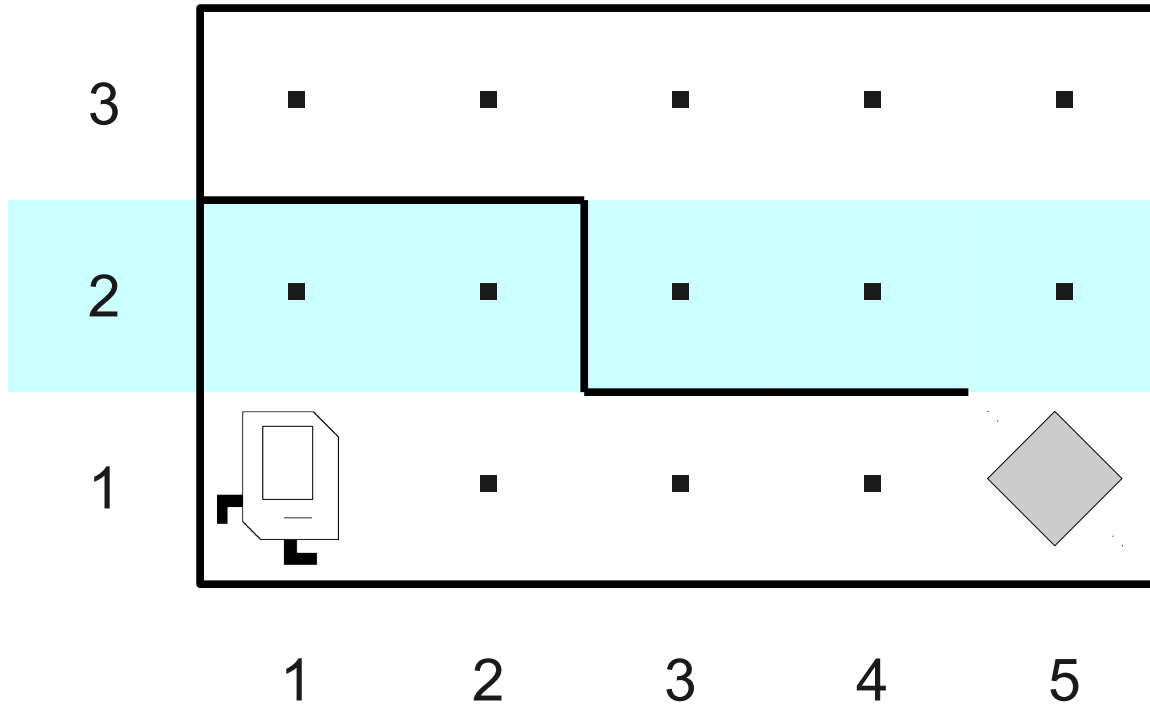
Karel's World



Karel's World

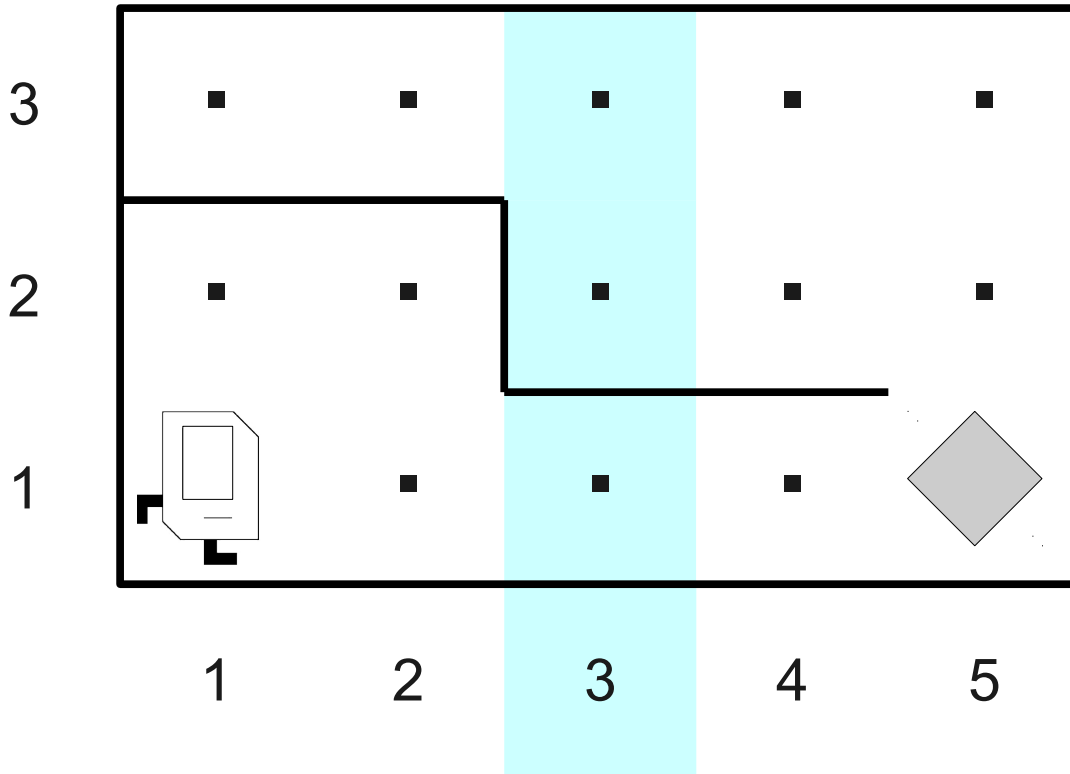


Karel's World

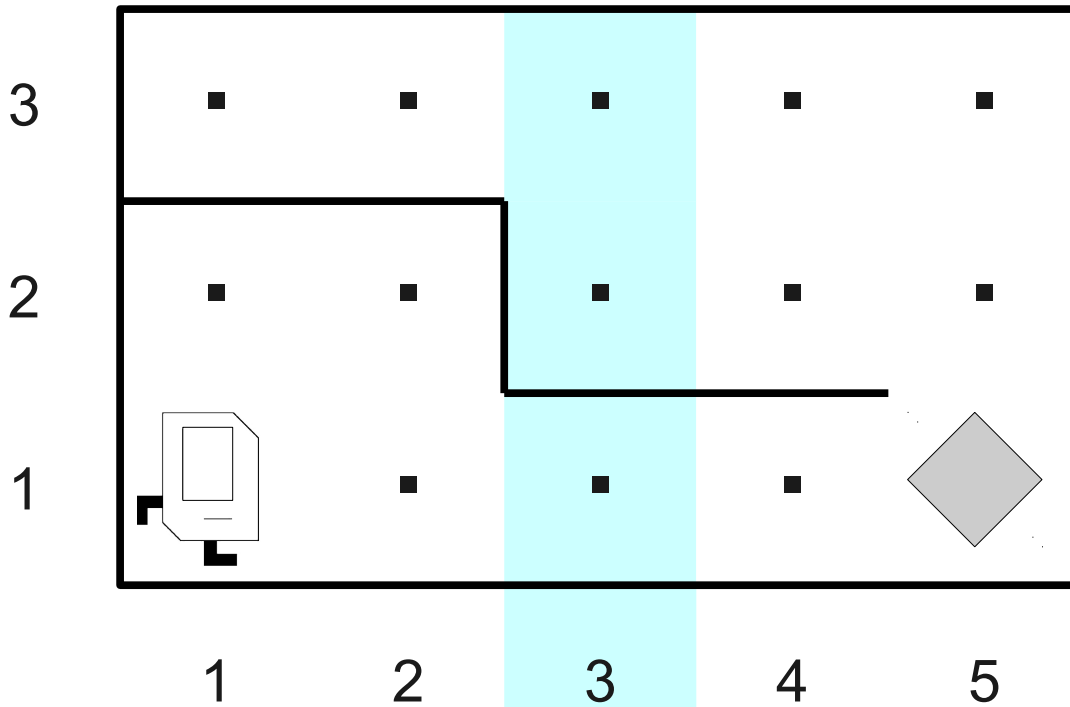


Each row is called a *street*.

Karel's World

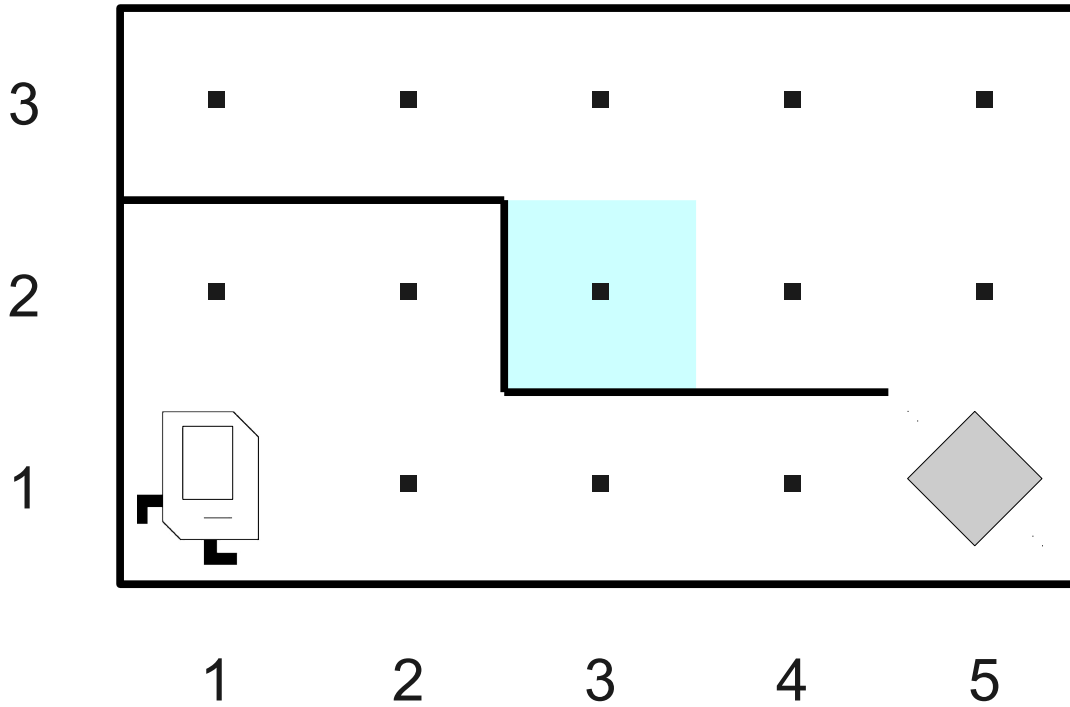


Karel's World

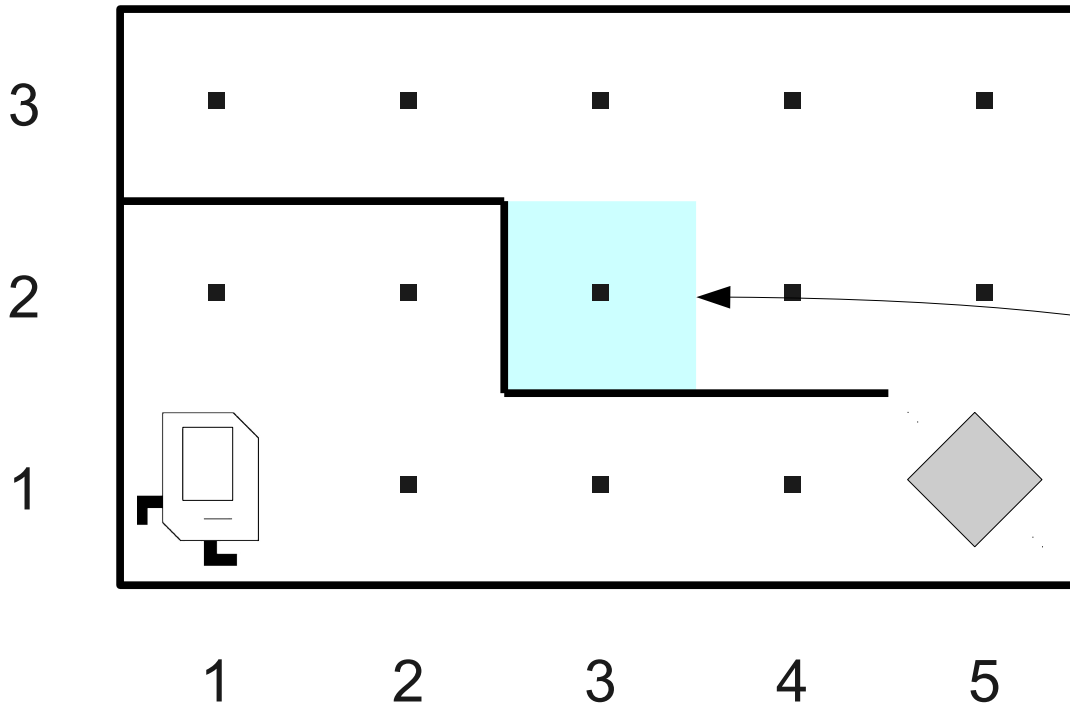


Each column is called an *avenue*.

Karel's World

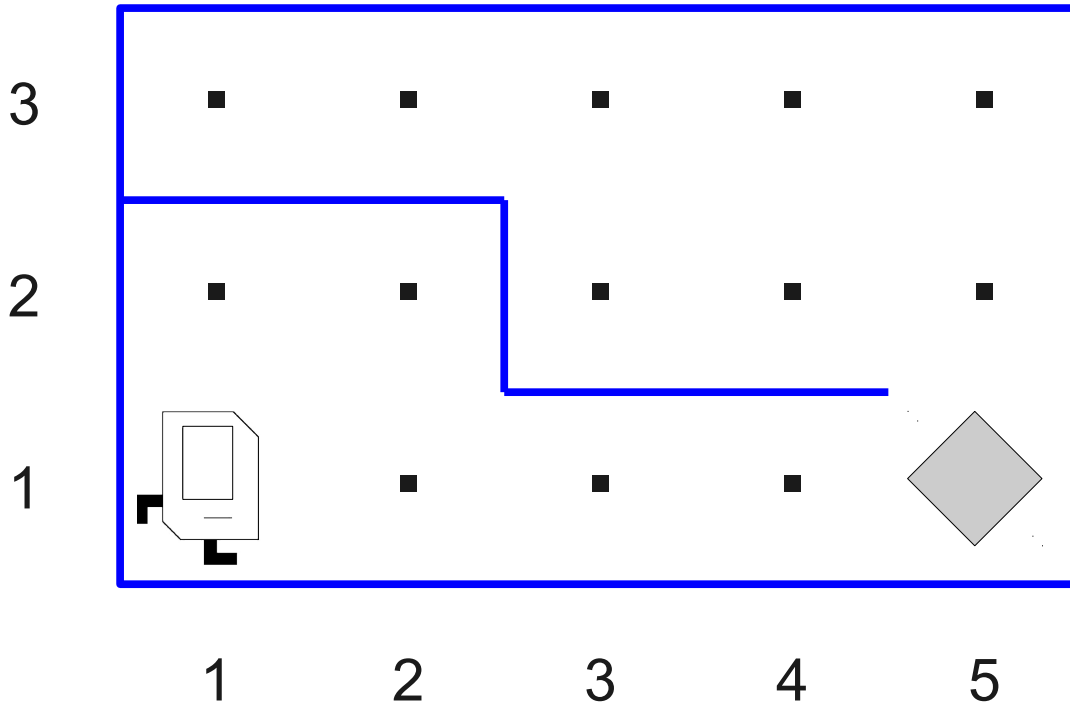


Karel's World

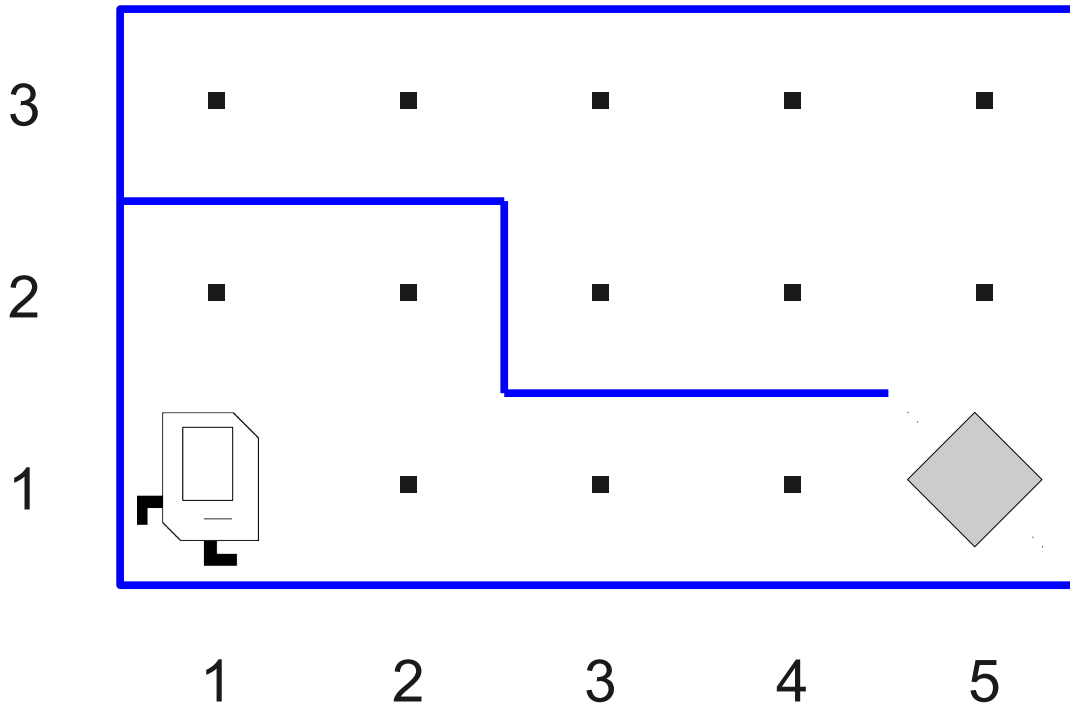


The intersection of a street and an avenue is a corner.

Karel's World

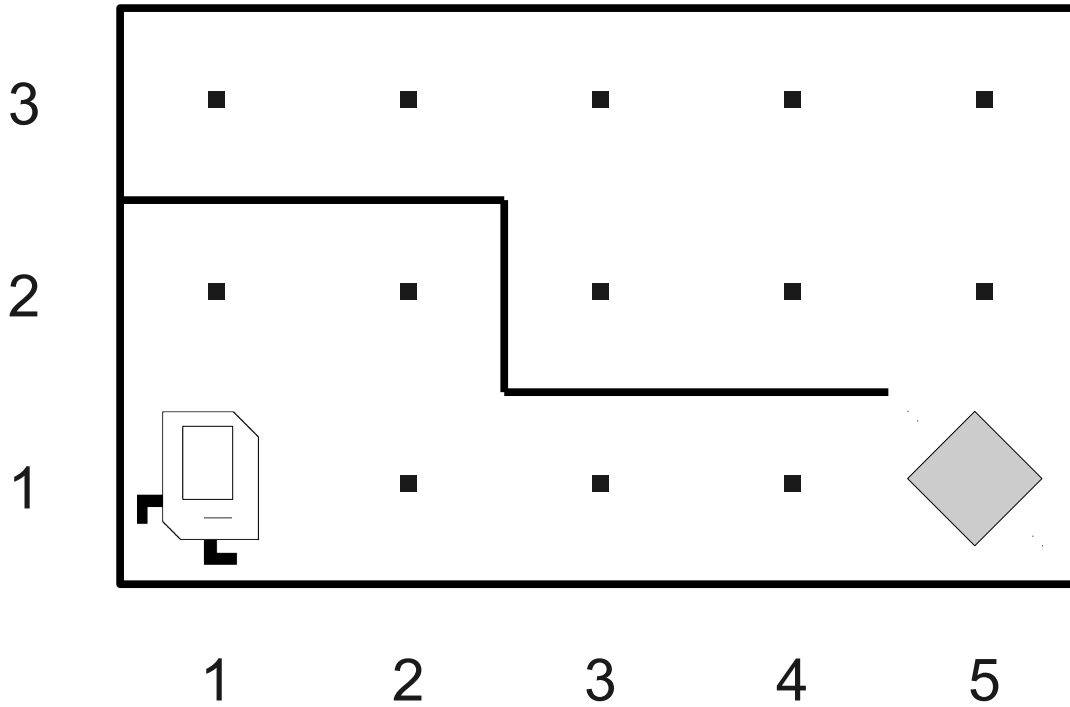


Karel's World

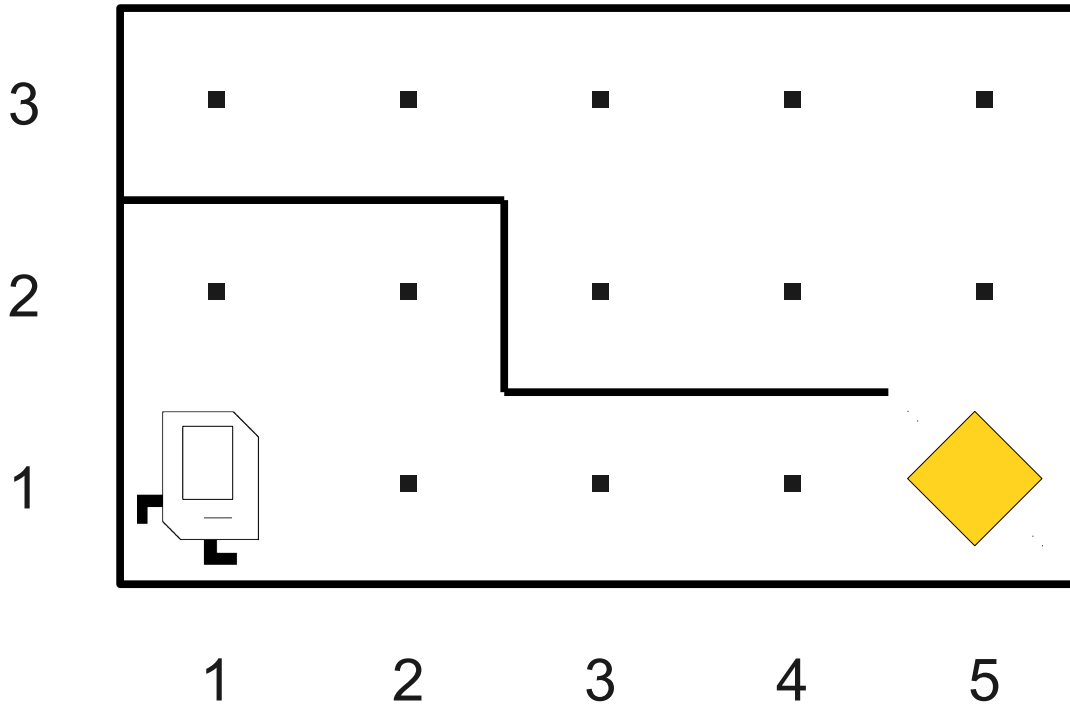


Karel cannot
move through
walls.

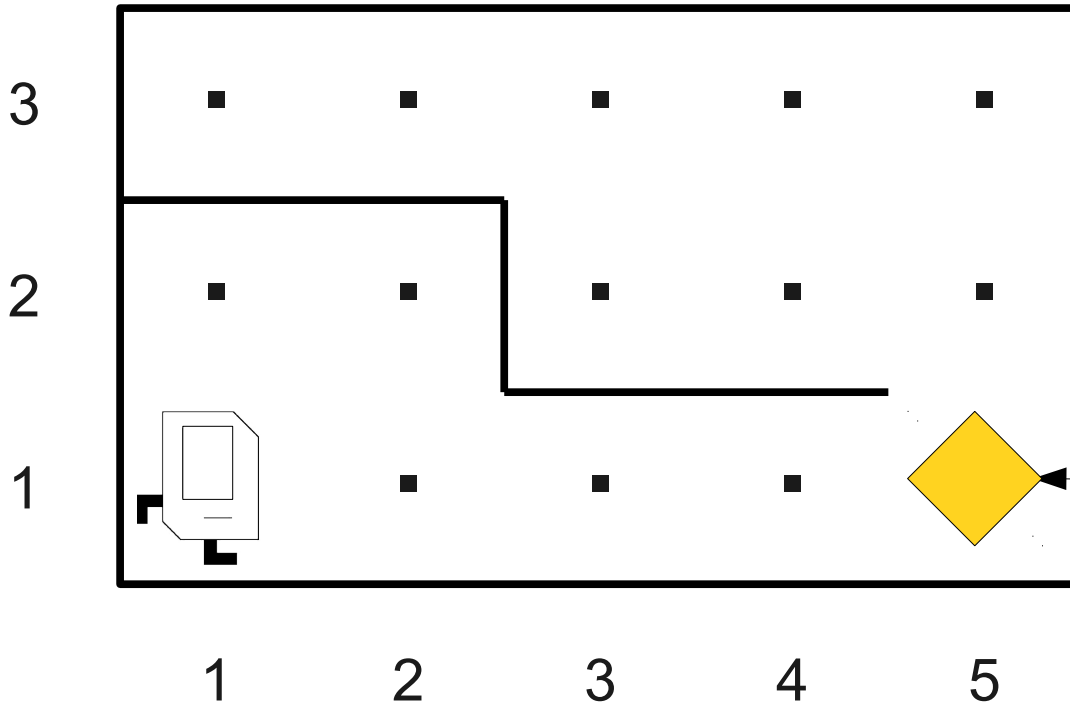
Karel's World



Karel's World

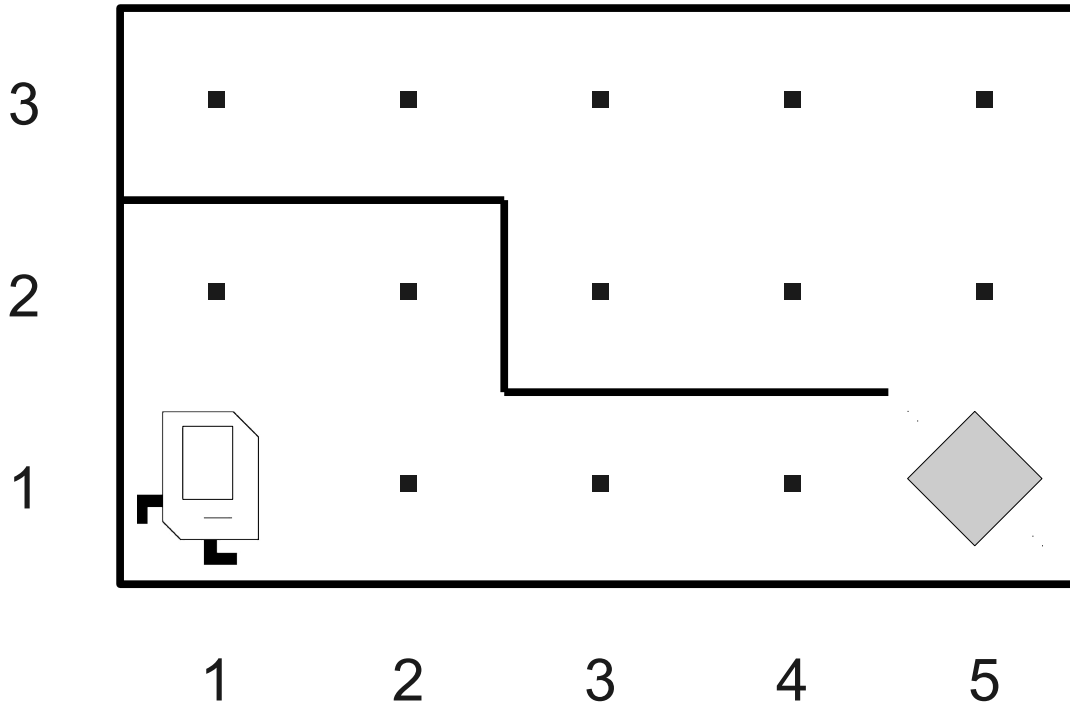


Karel's World

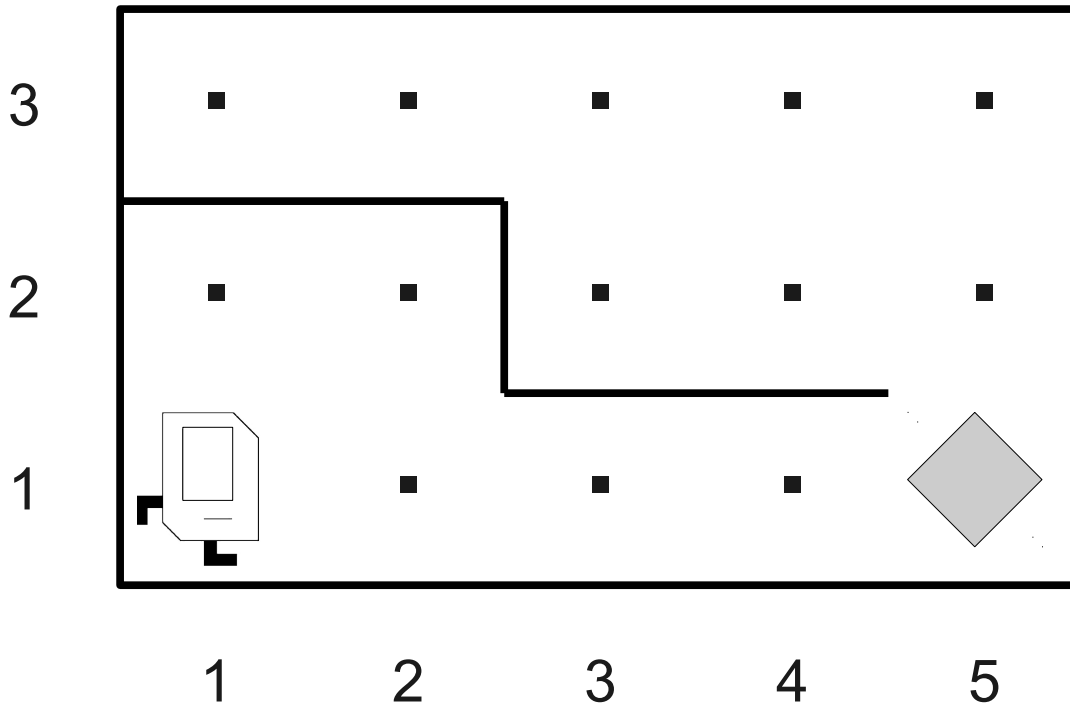


Beepers mark locations in Karel's world.

Karel's World

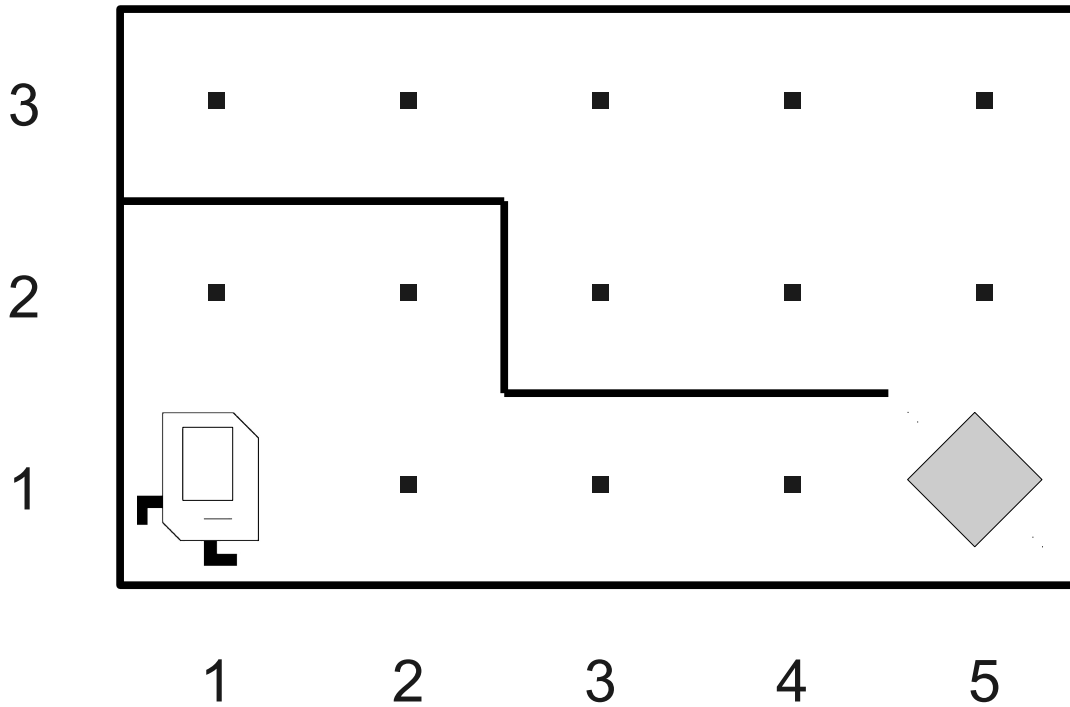


Karel's World



Karel Commands

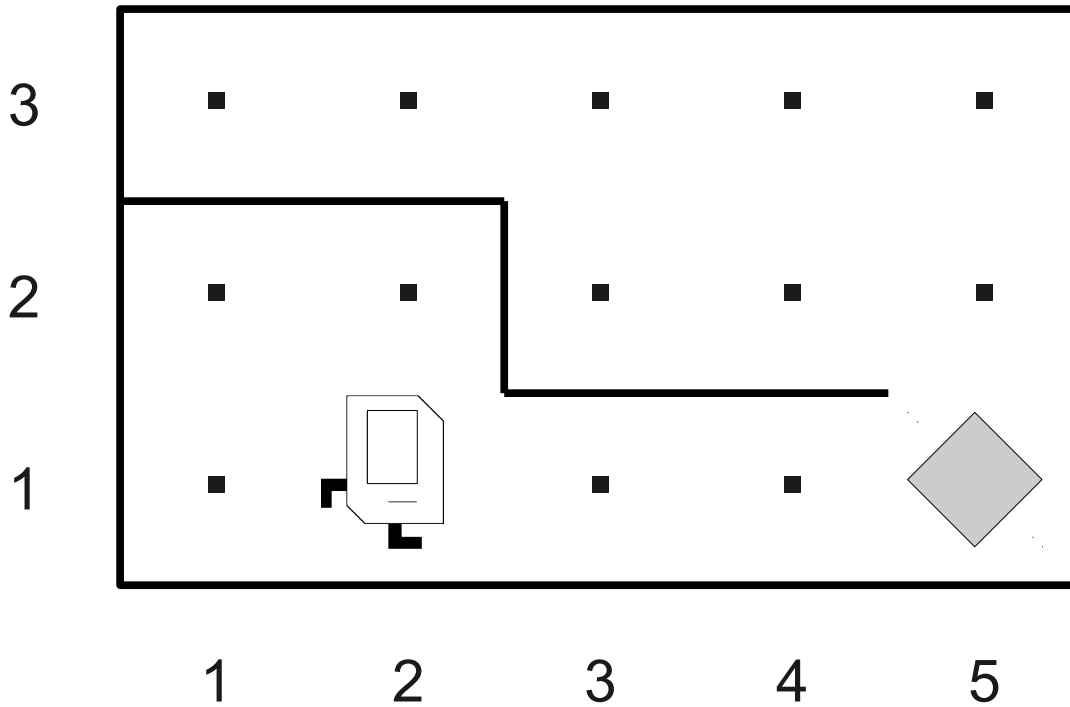
Karel's World



Karel Commands

move

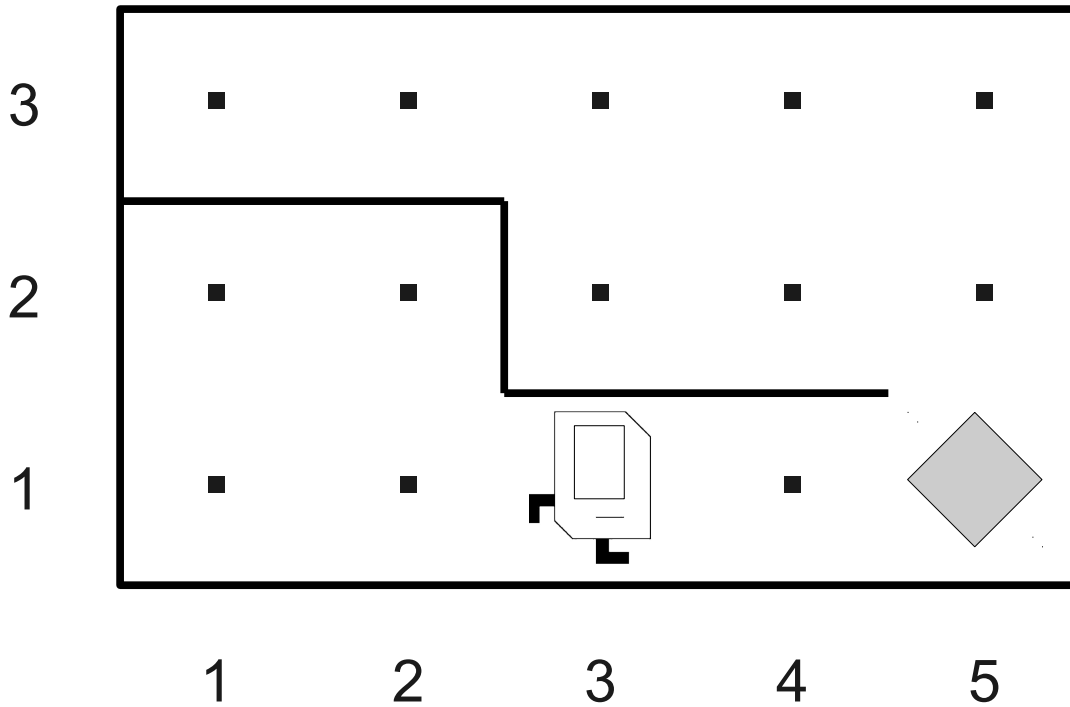
Karel's World



Karel Commands

move

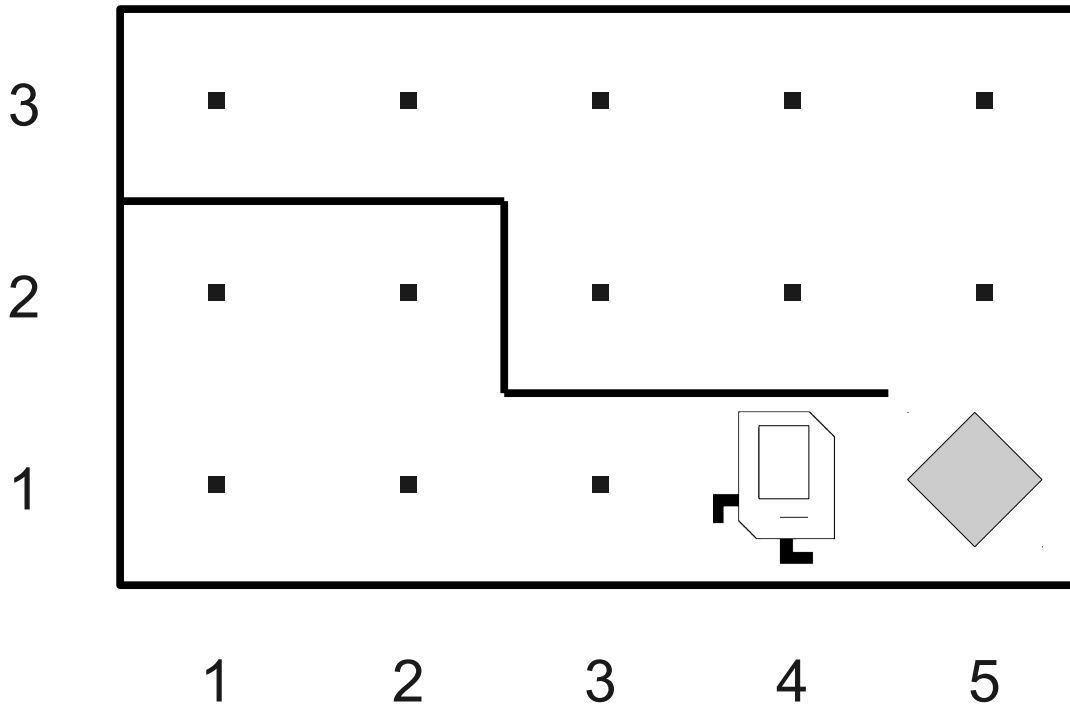
Karel's World



Karel Commands

move

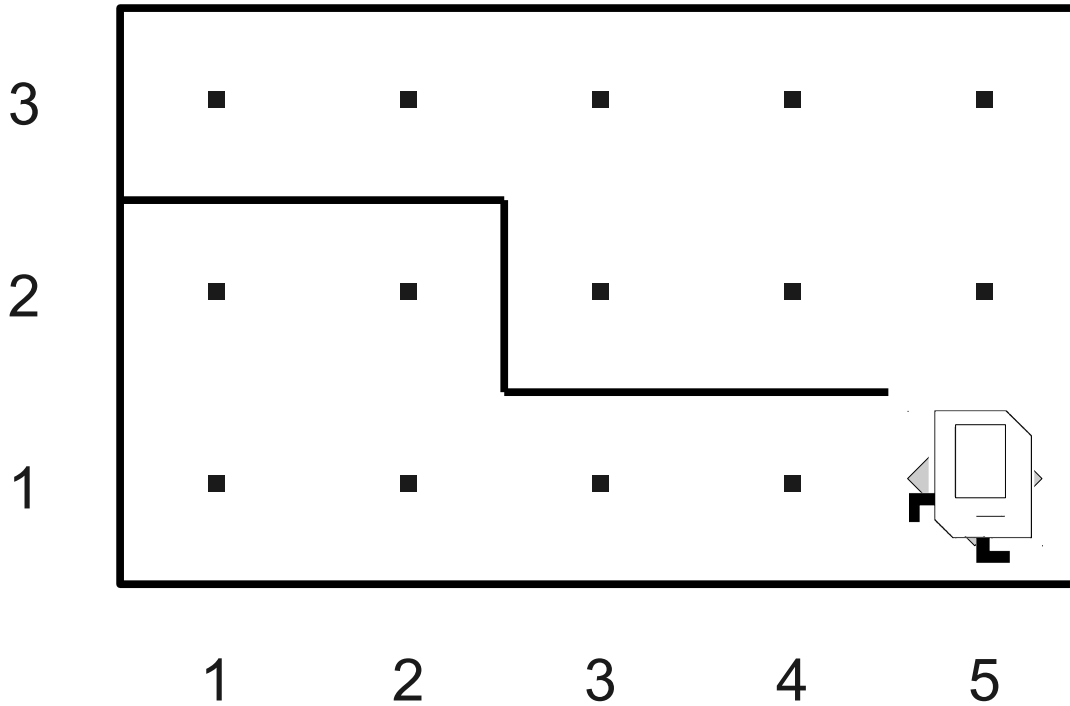
Karel's World



Karel Commands

move

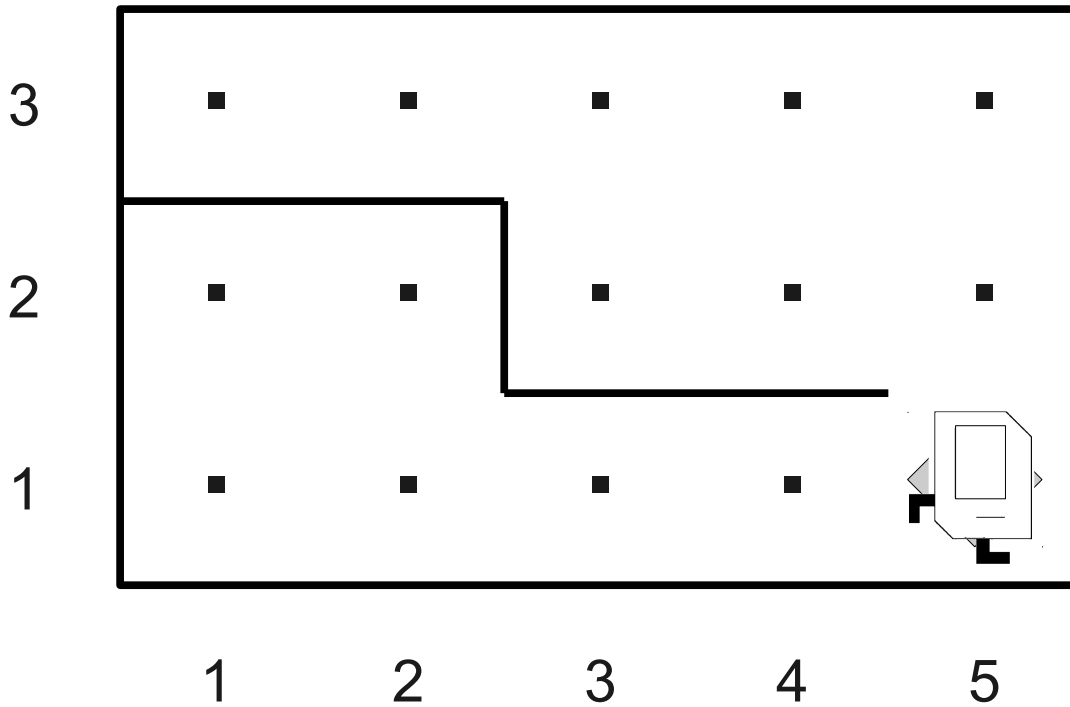
Karel's World



Karel Commands

move

Karel's World

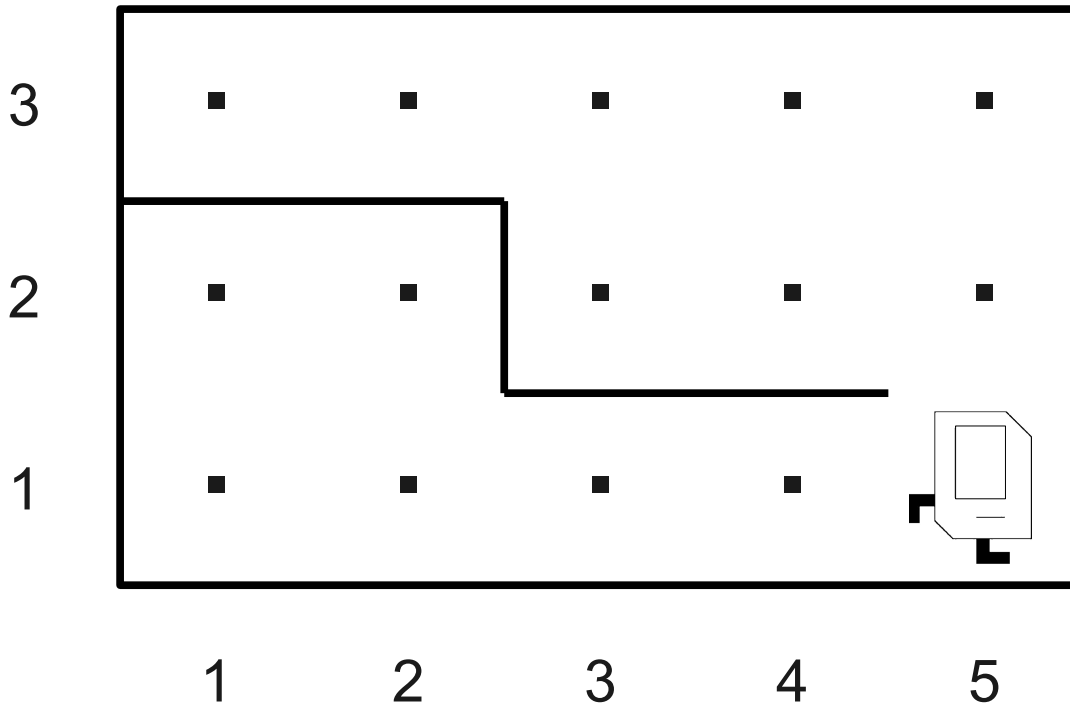


Karel Commands

move

pickBeeper

Karel's World

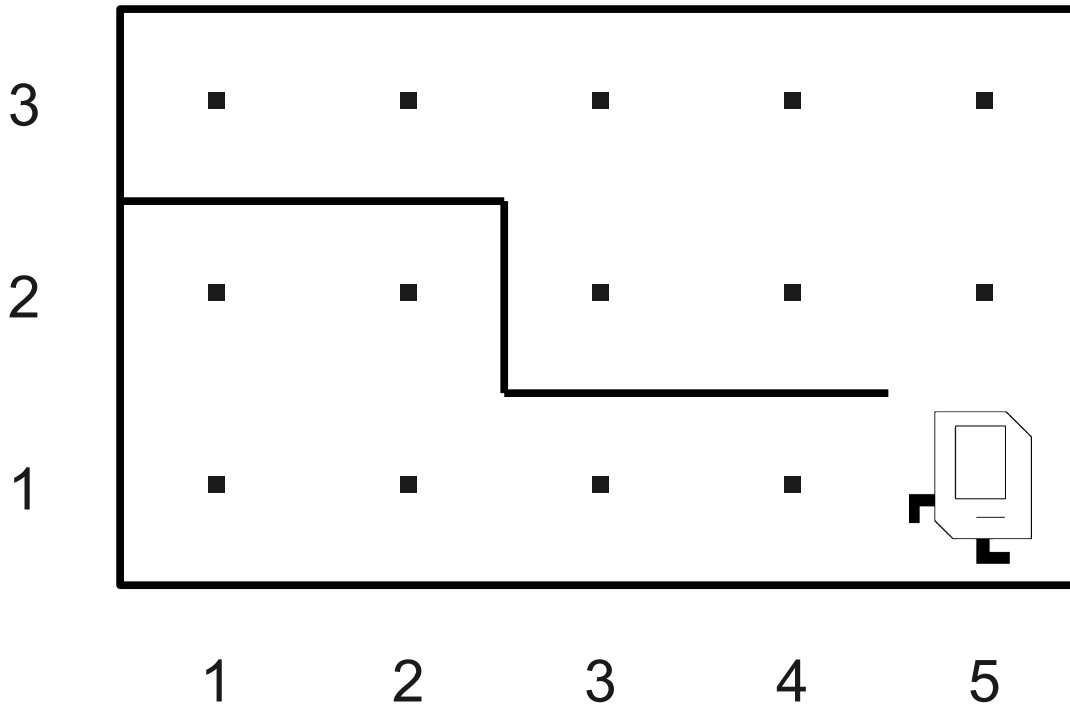


Karel Commands

move

pickBeeper

Karel's World



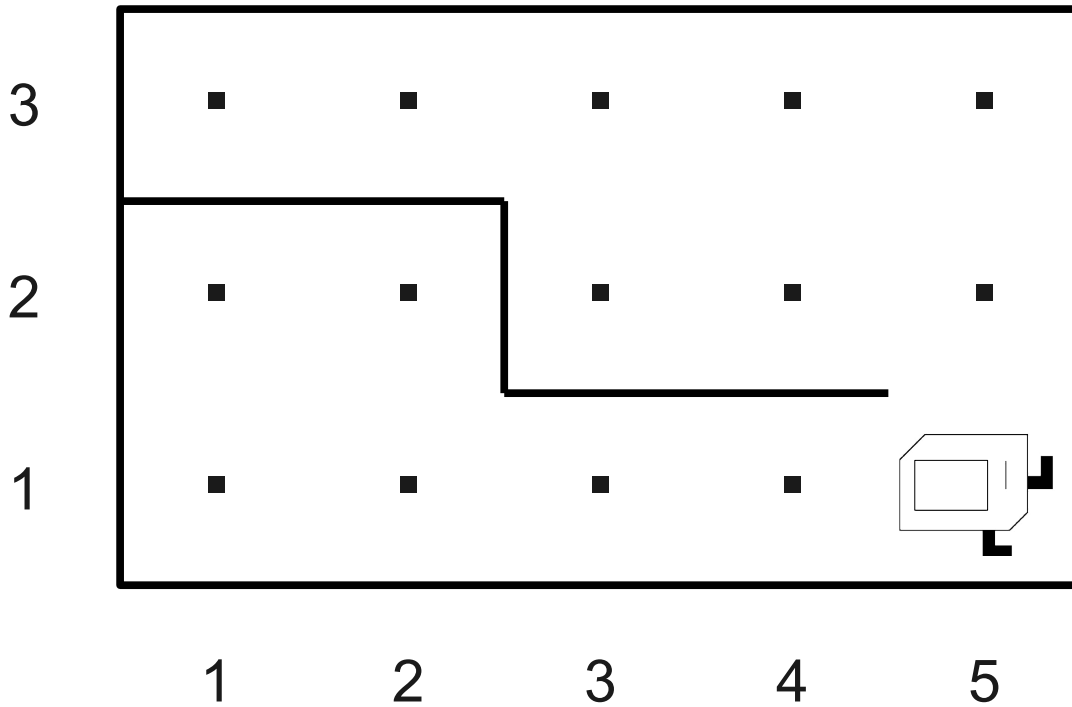
Karel Commands

move

pickBeeper

turnLeft

Karel's World



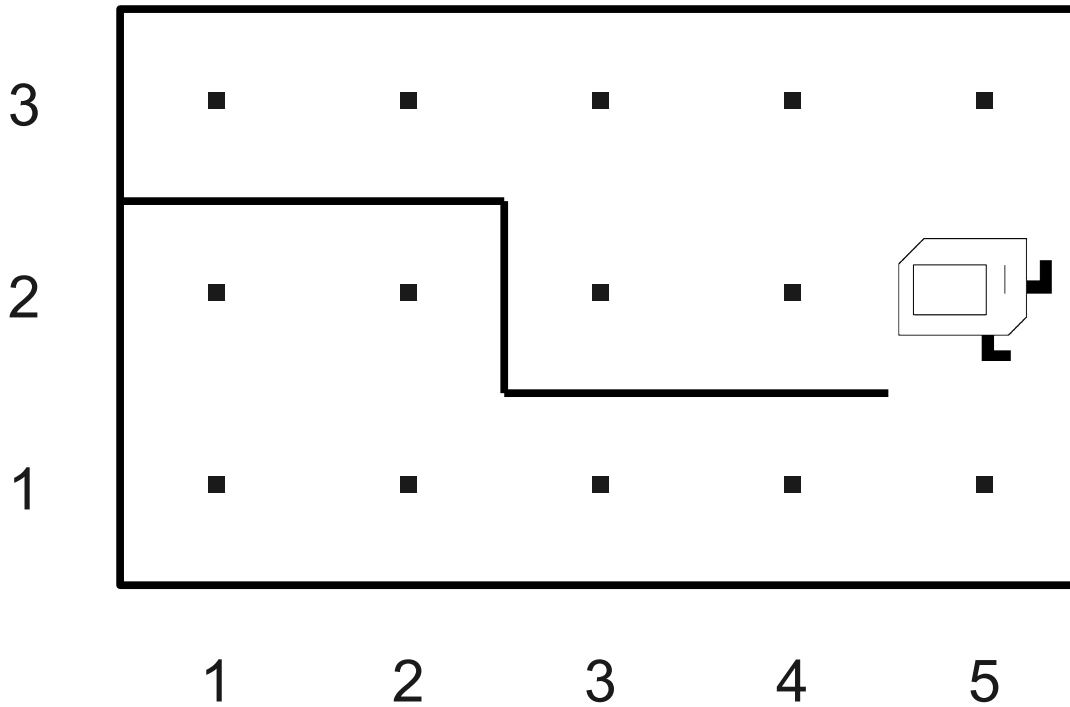
Karel Commands

move

pickBeeper

turnLeft

Karel's World



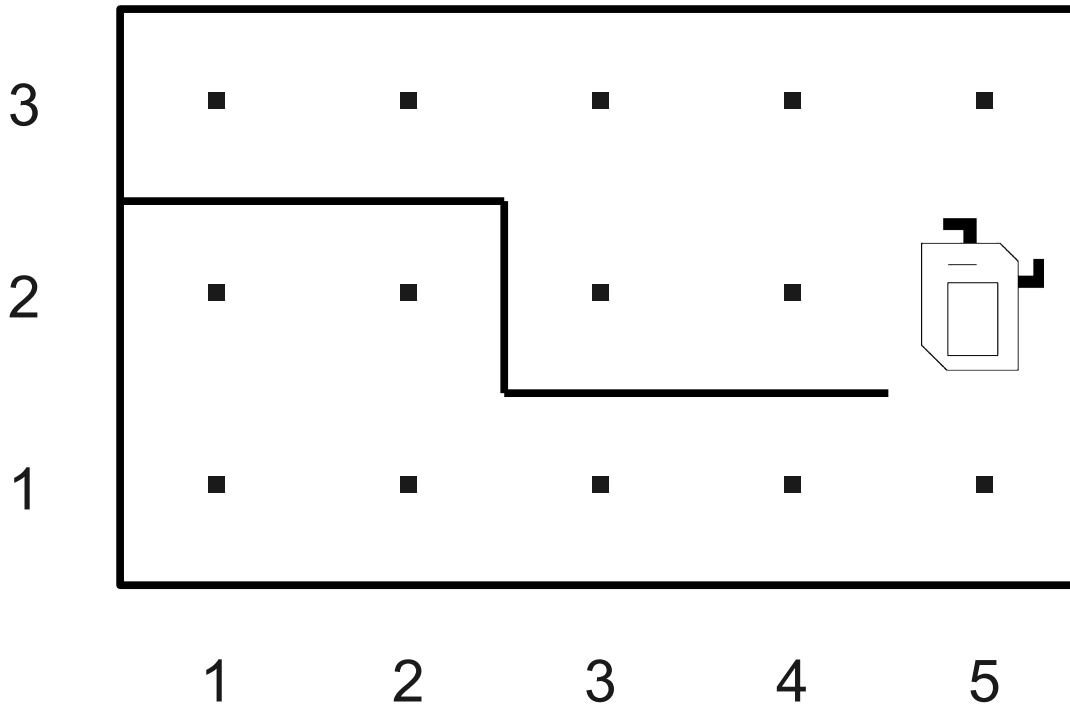
Karel Commands

move

pickBeeper

turnLeft

Karel's World



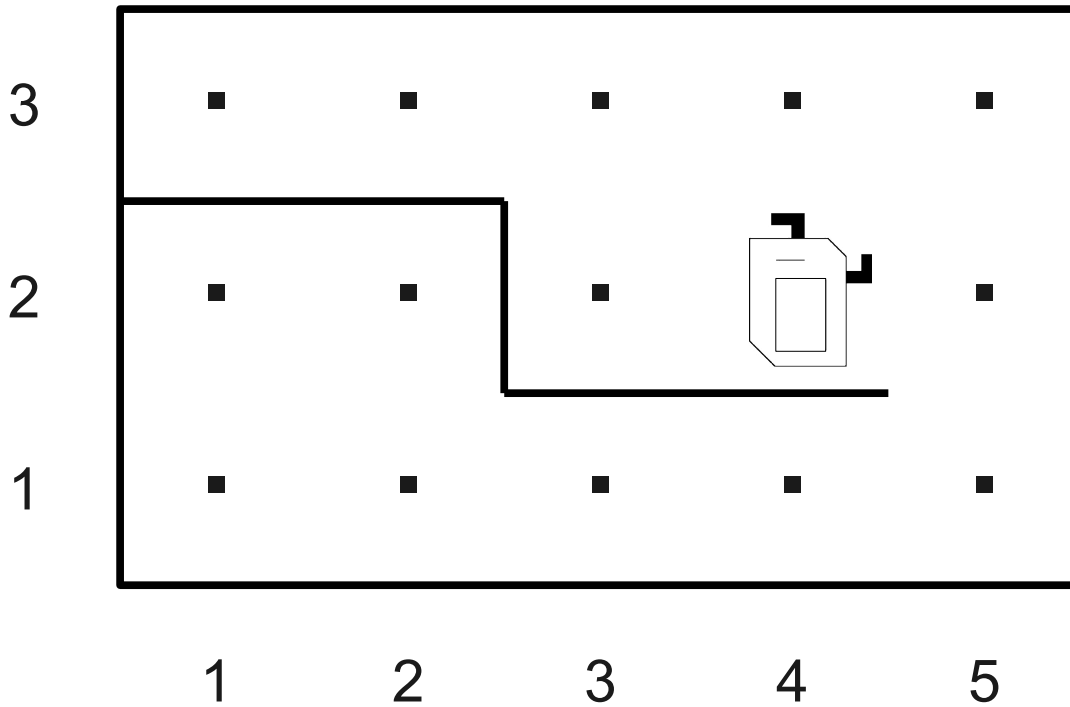
Karel Commands

move

pickBeeper

turnLeft

Karel's World



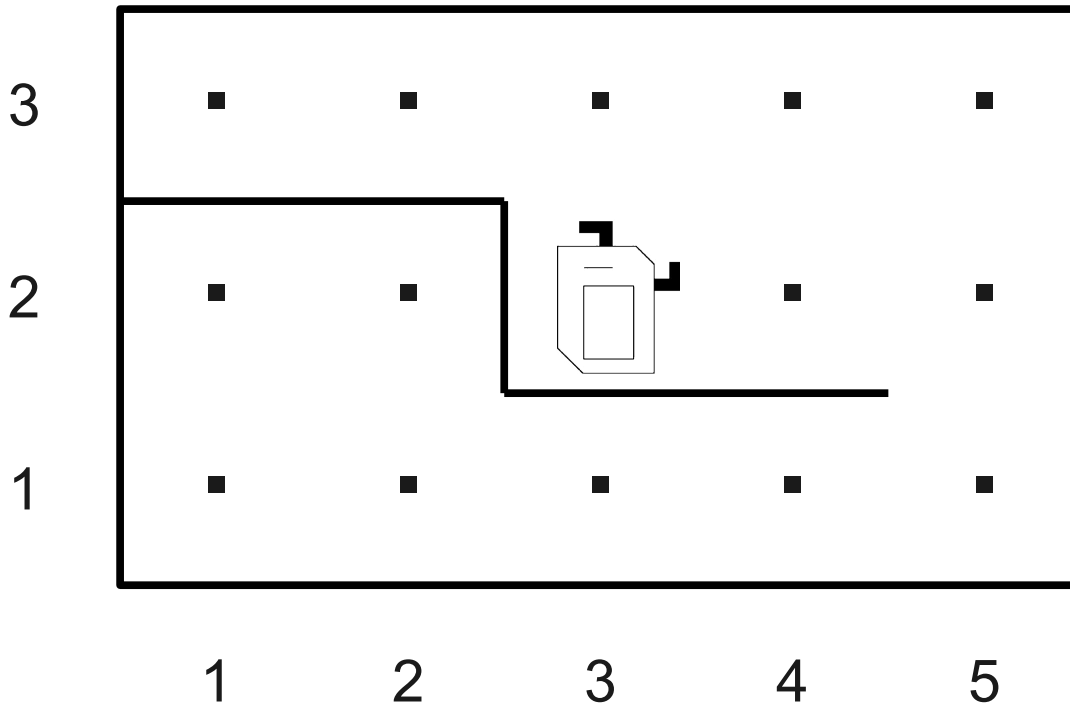
Karel Commands

move

pickBeeper

turnLeft

Karel's World



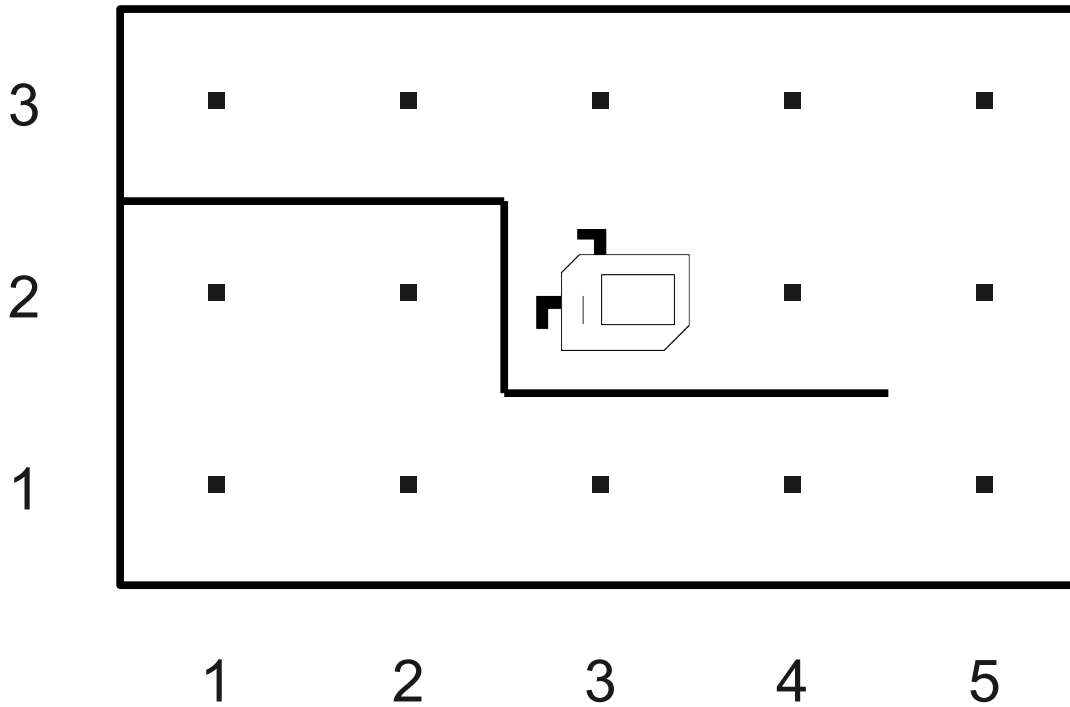
Karel Commands

move

pickBeeper

turnLeft

Karel's World



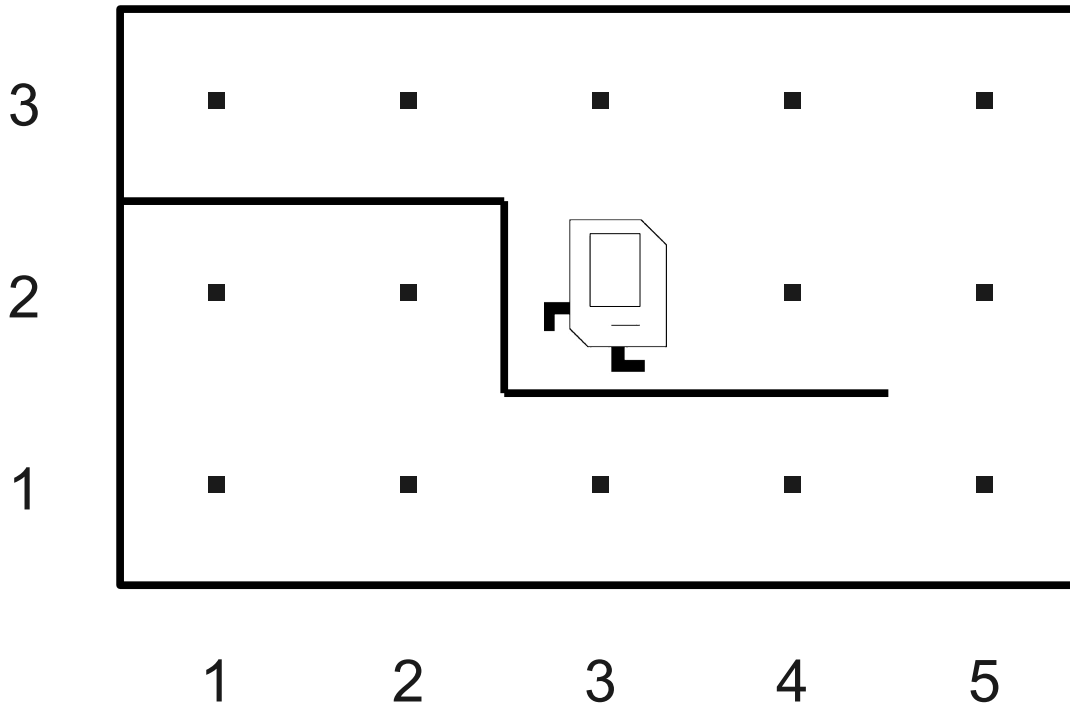
Karel Commands

move

pickBeeper

turnLeft

Karel's World



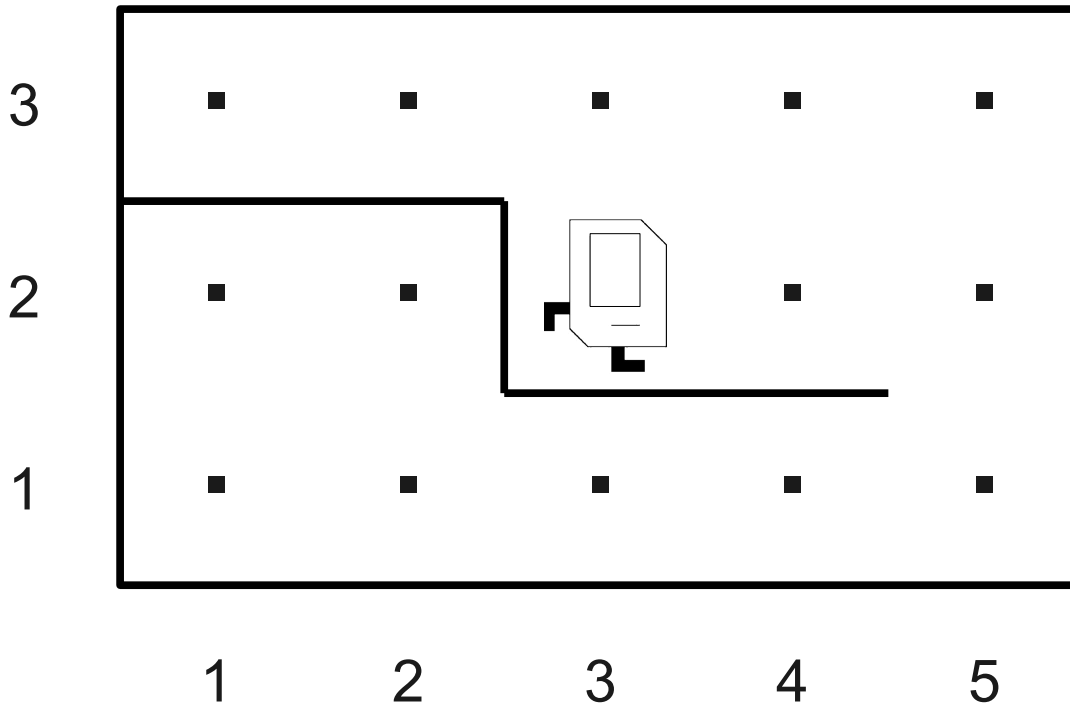
Karel Commands

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Karel's World



Karel Commands

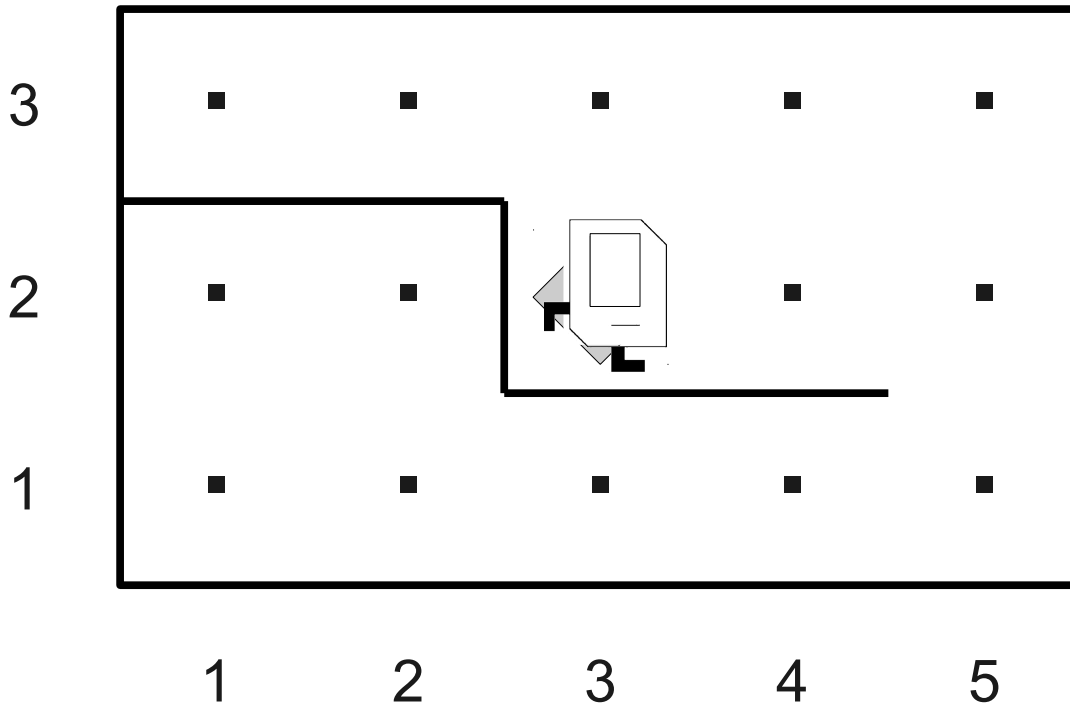
move

pickBeeper

turnLeft

putBeeper

Karel's World



Karel Commands

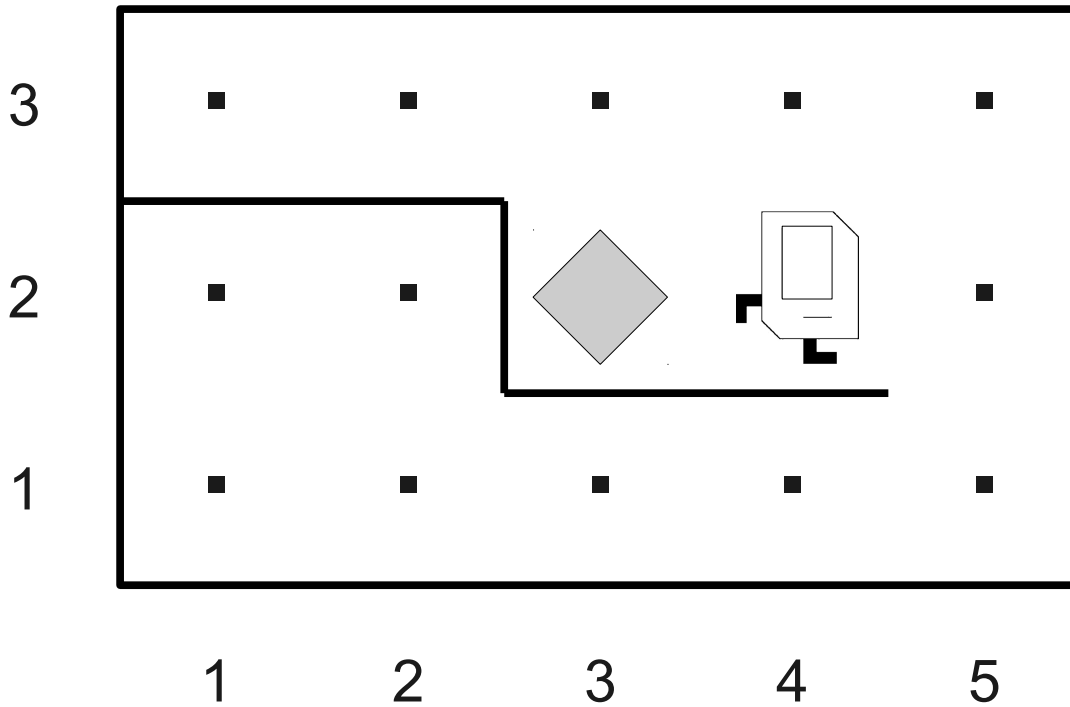
move

pickBeeper

turnLeft

putBeeper

Karel's World



Karel Commands

move
pickBeeper
turnLeft
putBeeper

Get Ready!

It's Time for Your
Very First Karel Program!