

Welcome to CS106A!

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

Who's Here Today?

- Aeronautical Engineering
- African Studies
- Applied Physics
- Bioengineering
- Biology
- Business Administration
- Chemical Engineering
- Chemistry
- Chinese
- Civil Engineering
- Classics
- Communication
- Comparative Literature
- Creative Writing
- Earth Systems
- East Asian Studies
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- Music
- Neuroscience
- Philosophy
- Physics
- Political Science
- Public Policy
- Psychology
- Science, Technology, and Society
- Spanish
- Statistics
- Symbolic Systems
- Urban Studies
- **Undeclared!**

Course Staff

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

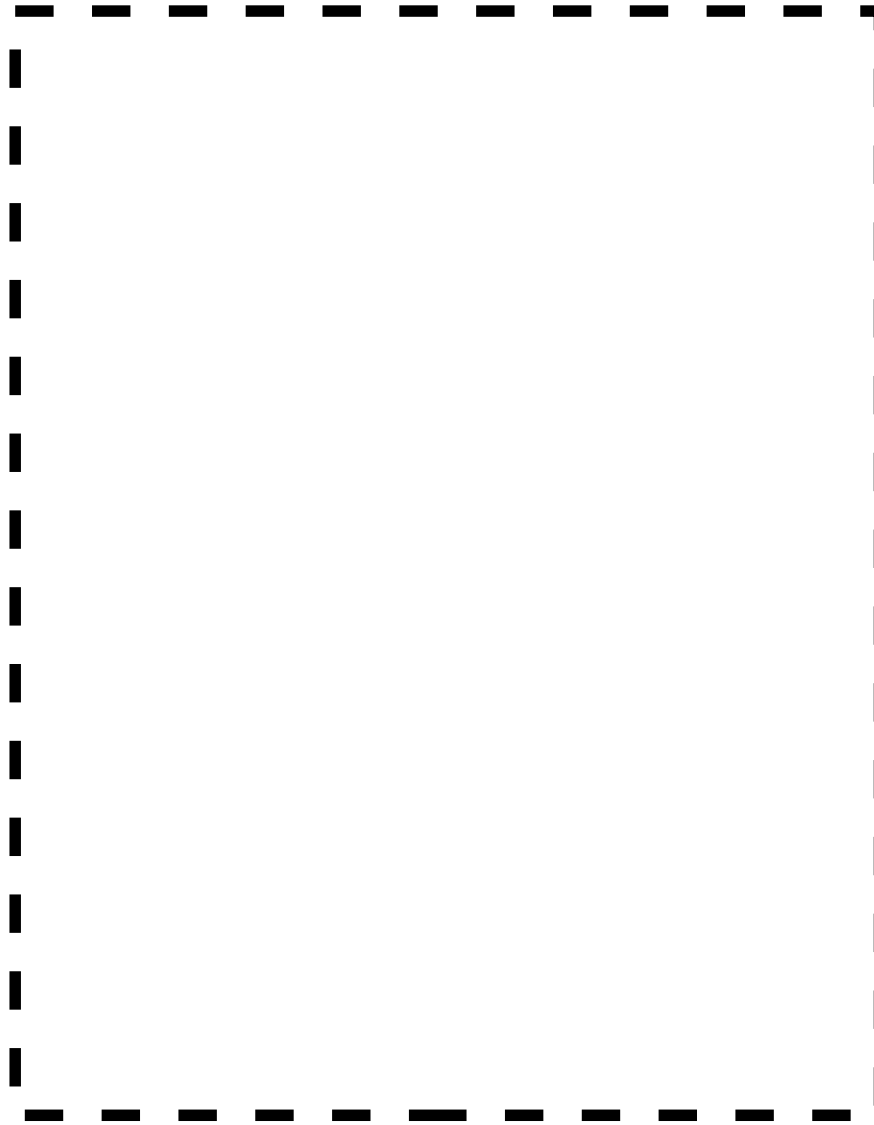
Head TA: Gil Shotan
(gilsho@stanford.edu)

The CS106A Section Leaders
The CS106A Course Helpers

Course Website

<http://cs106a.stanford.edu>

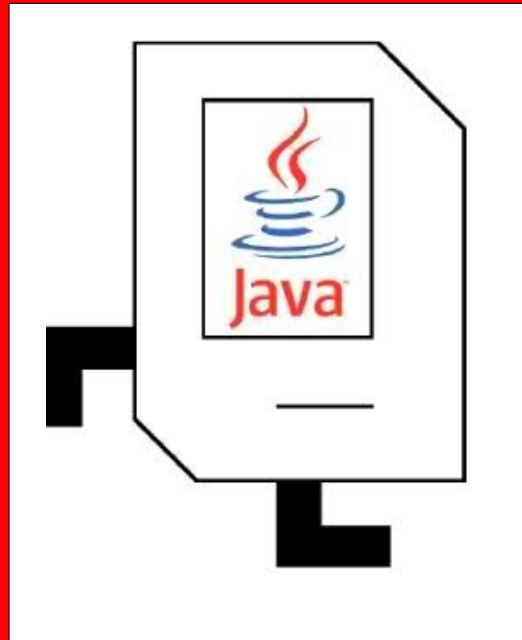
Prerequisites



The void where
prerequisites
usually go

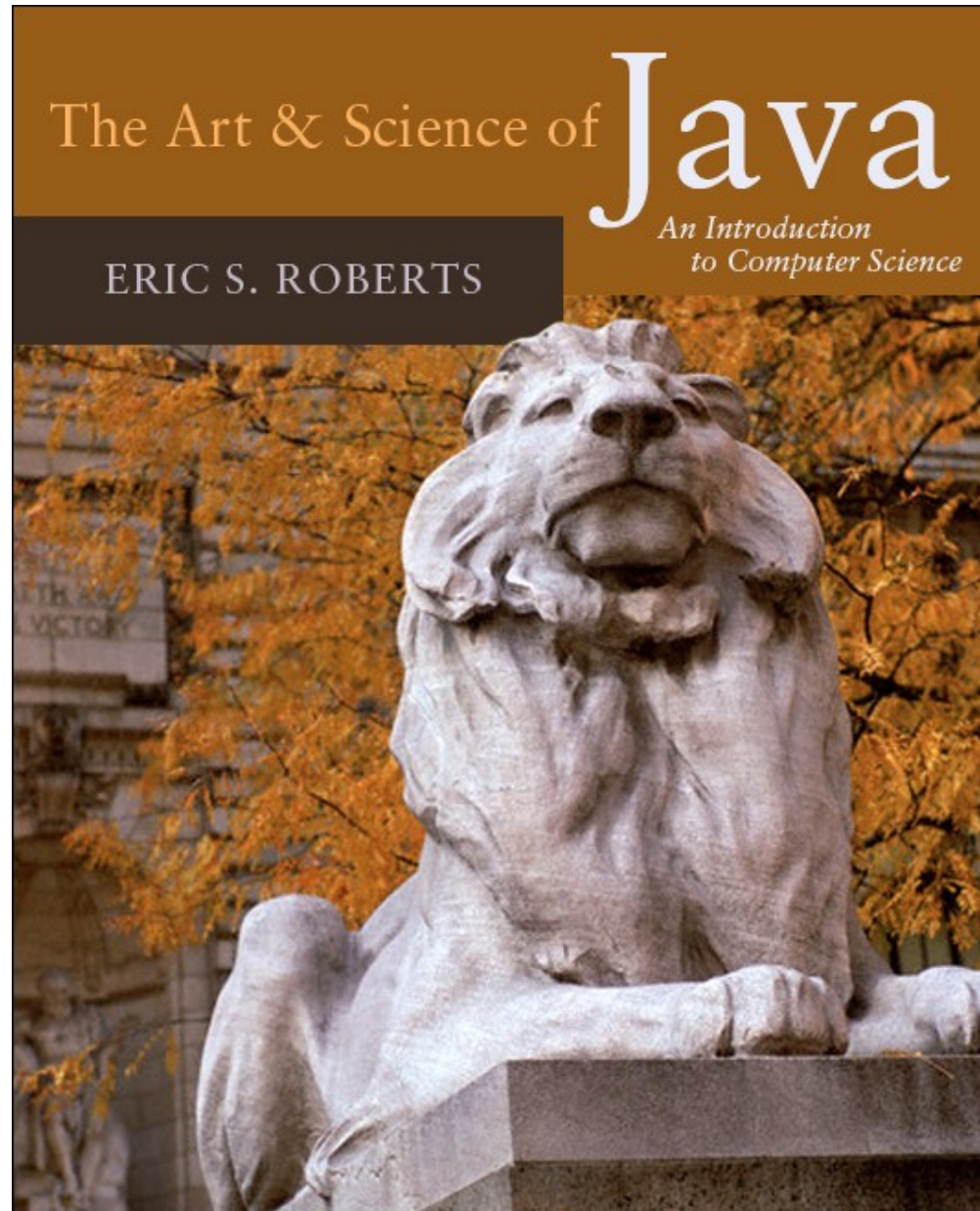
Required Reading

KAREL THE ROBOT



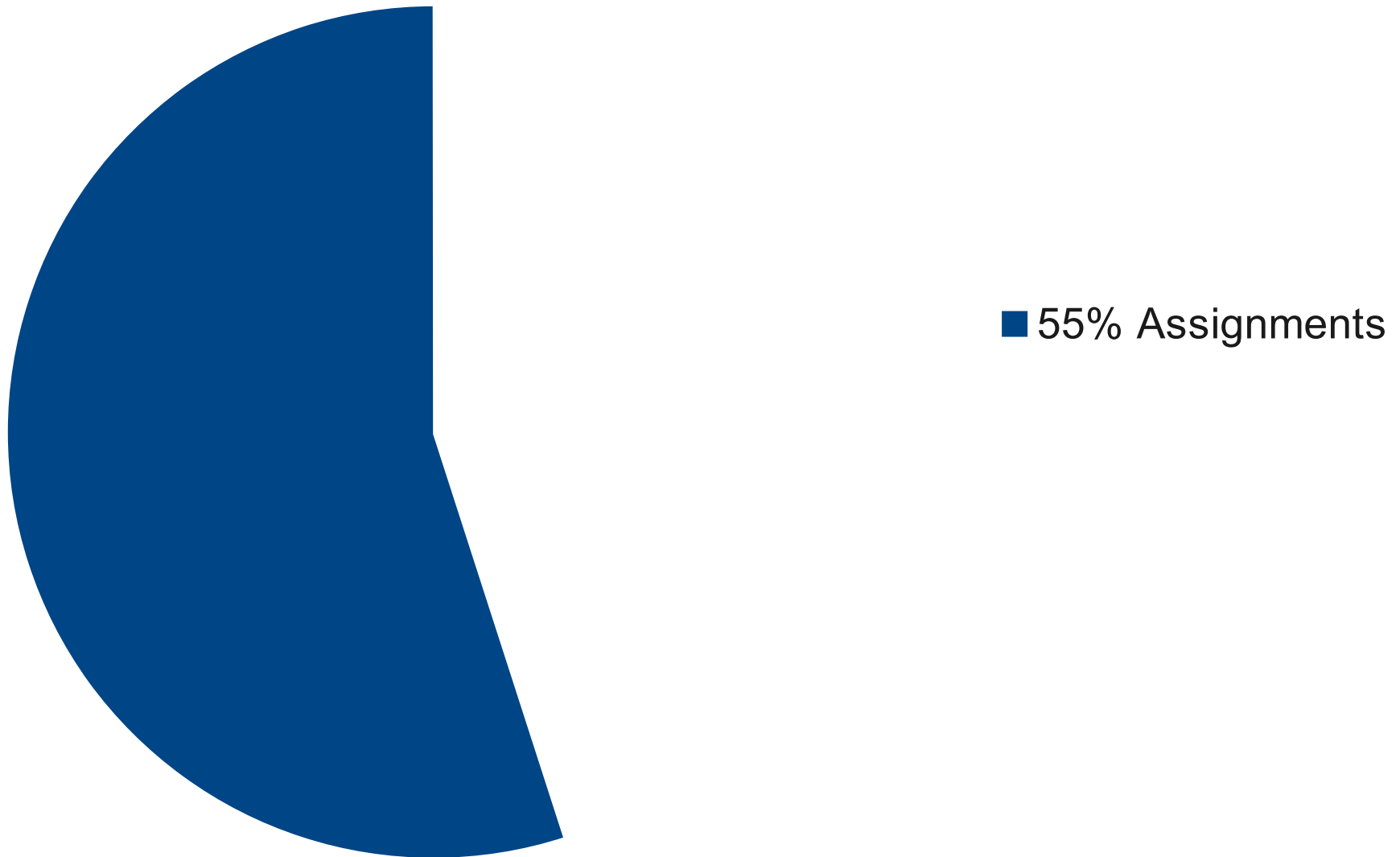
LEARNS JAVA

Required Reading



Grading Policies

Grading Policies



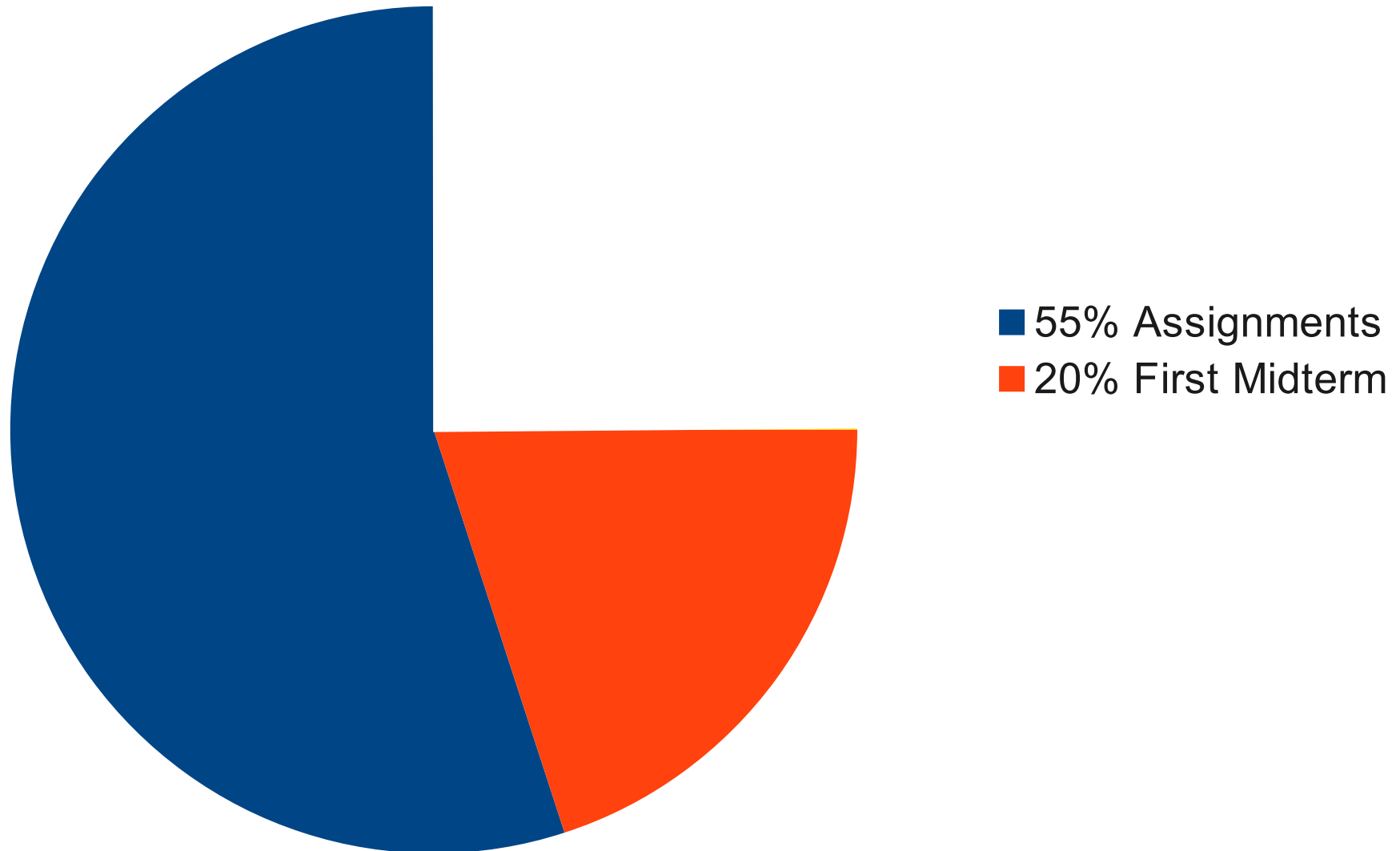
Grading Policies



■ 55% Assignments

Seven Programming
Assignments

Grading Policies



Grading Policies



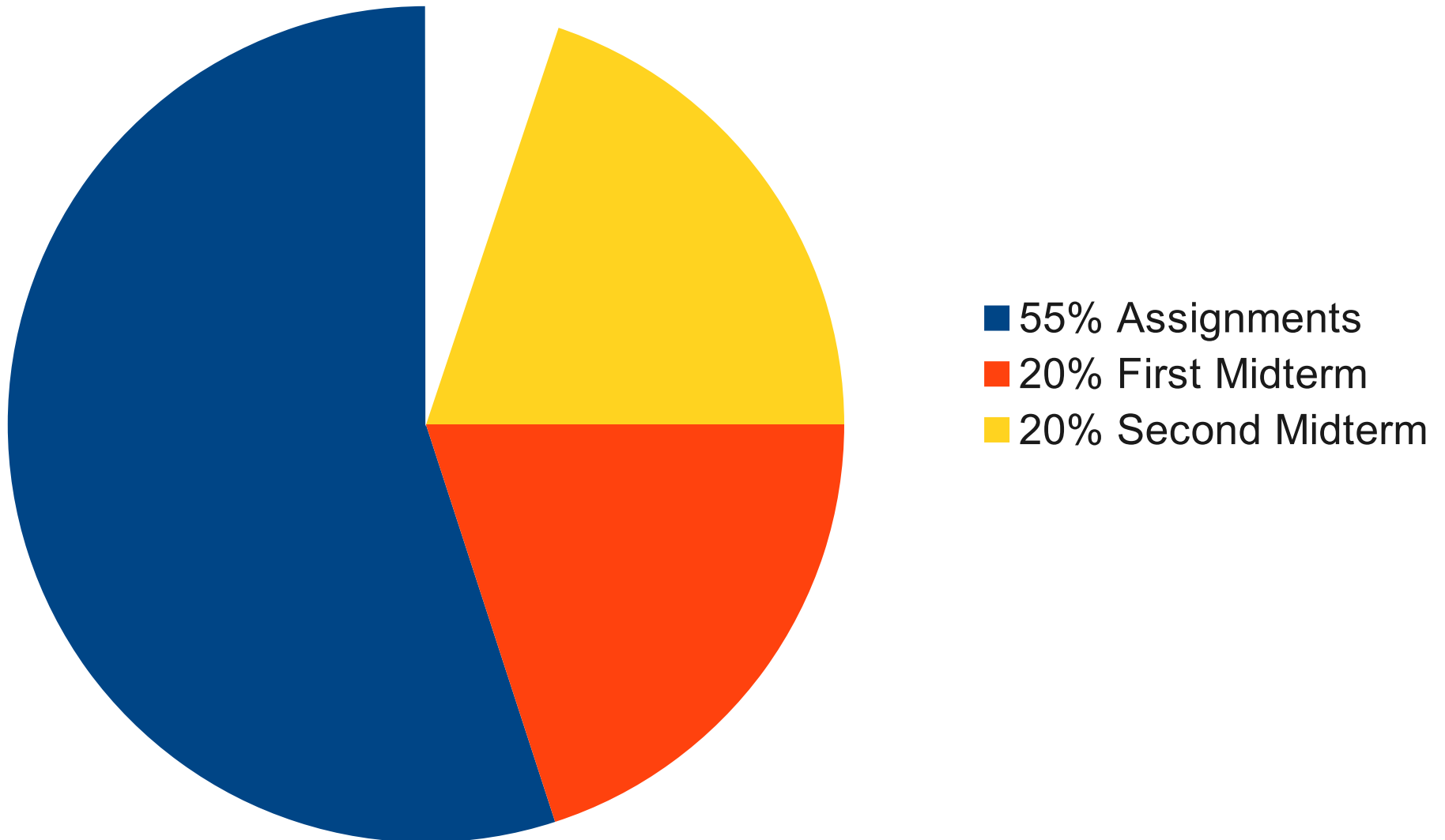
■ 55% Assignments

■ 20% First Midterm

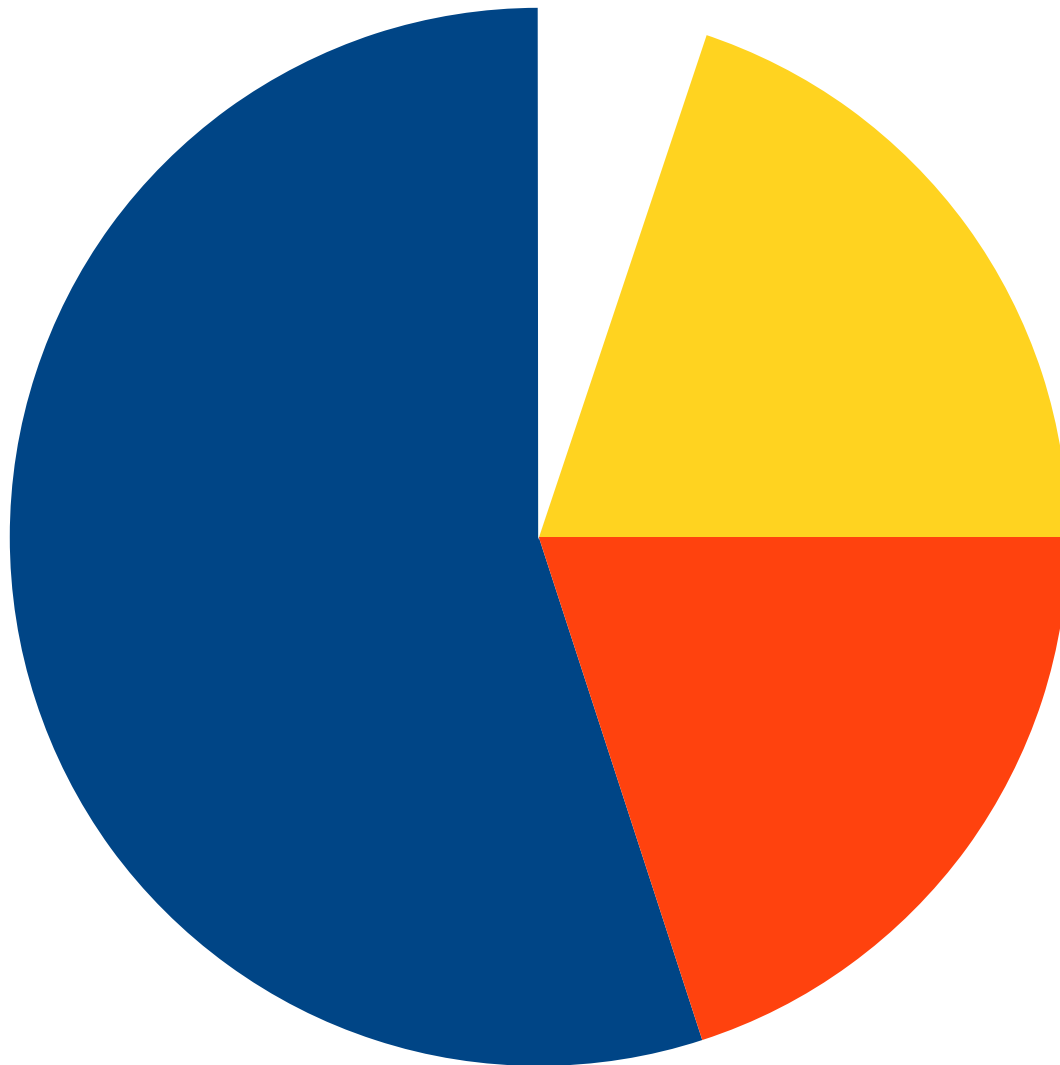
First Midterm Exam

Monday, February 11
7PM - 10PM

Grading Policies



Grading Policies

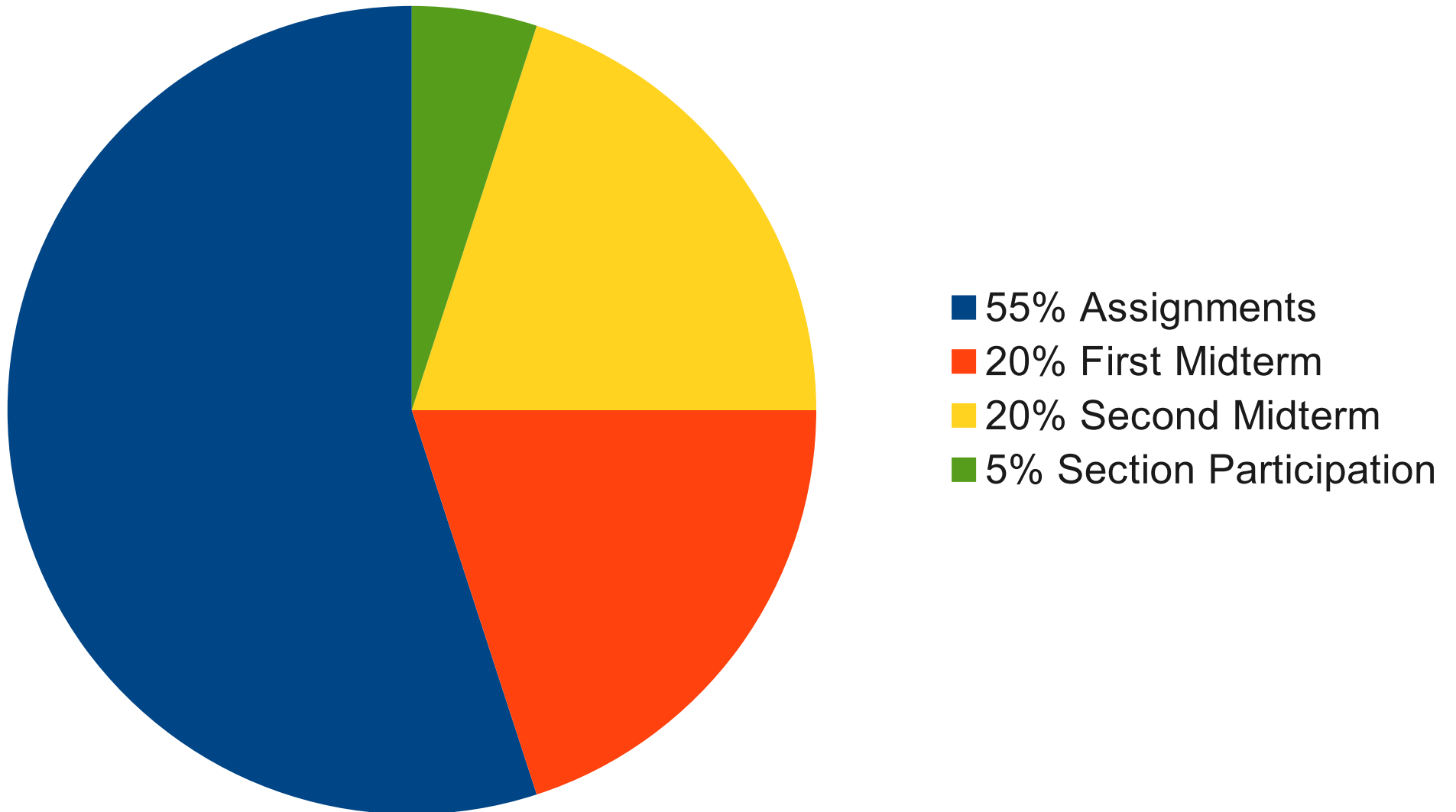


- 55% Assignments
- 20% First Midterm
- 20% Second Midterm

Second Midterm Exam

Monday, March 11
7PM - 10PM

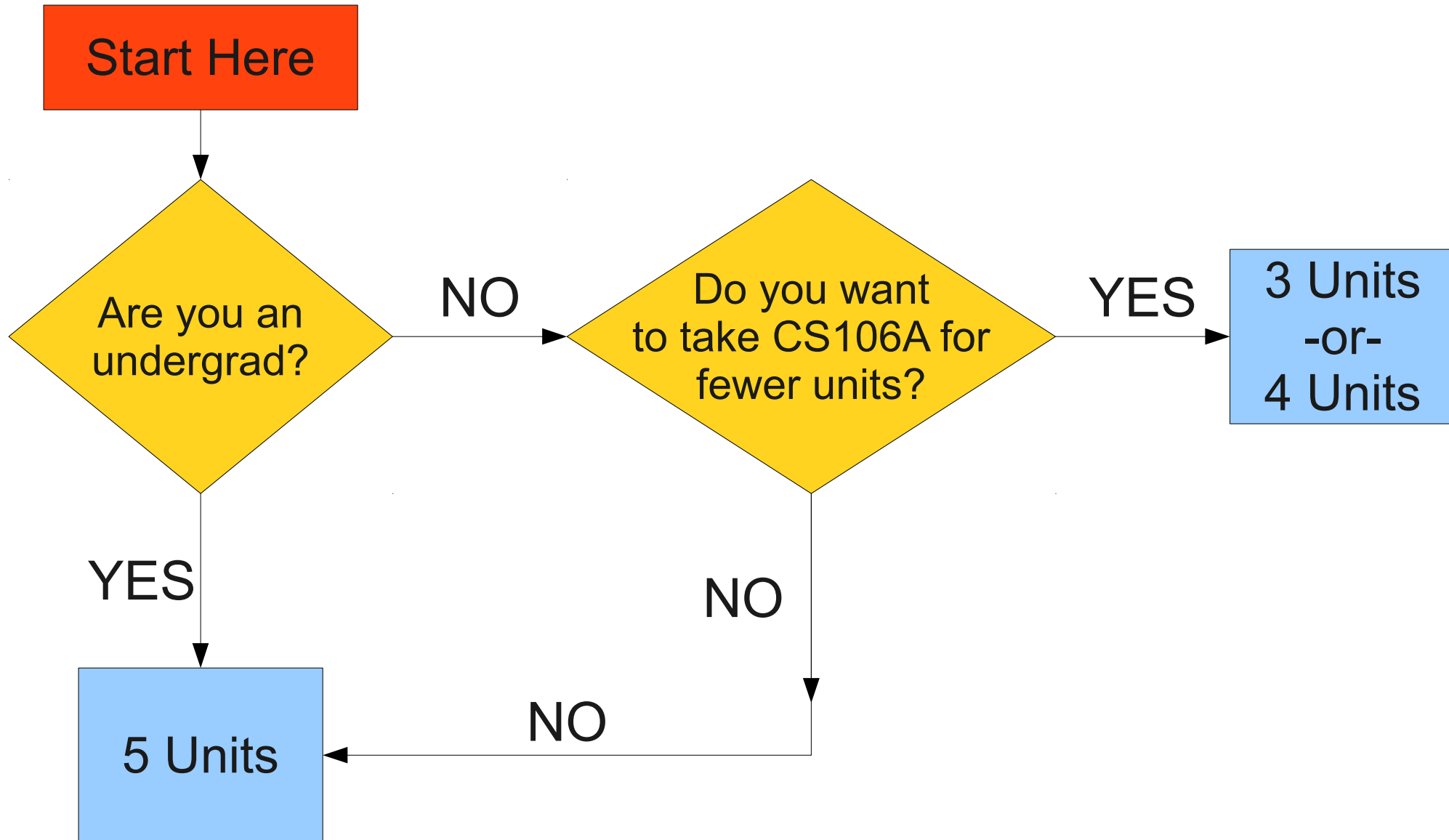
Grading Policies



Discussion Sections

- Weekly discussion sections.
- Section attendance is **required** in CS106A.
- Sign up between Thursday, January 10 at 5:00PM and Sunday, January 13 at 5:00PM at **<http://cs198.stanford.edu/section>**
- Do not enroll through Axxess; everything will be handled through the above link.

The CS106A Units Flowchart





Getting Help

- LaIR Hours!
 - Sunday - Thursday, 6PM - Midnight
 - Starts next week.
- Gil's Office Hours in Gates 160
 - Monday/Wednesday, **10AM - 12PM**
- Keith's Office Hours in Gates 178
 - Tuesdays, 2 - 4PM.

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”

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

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

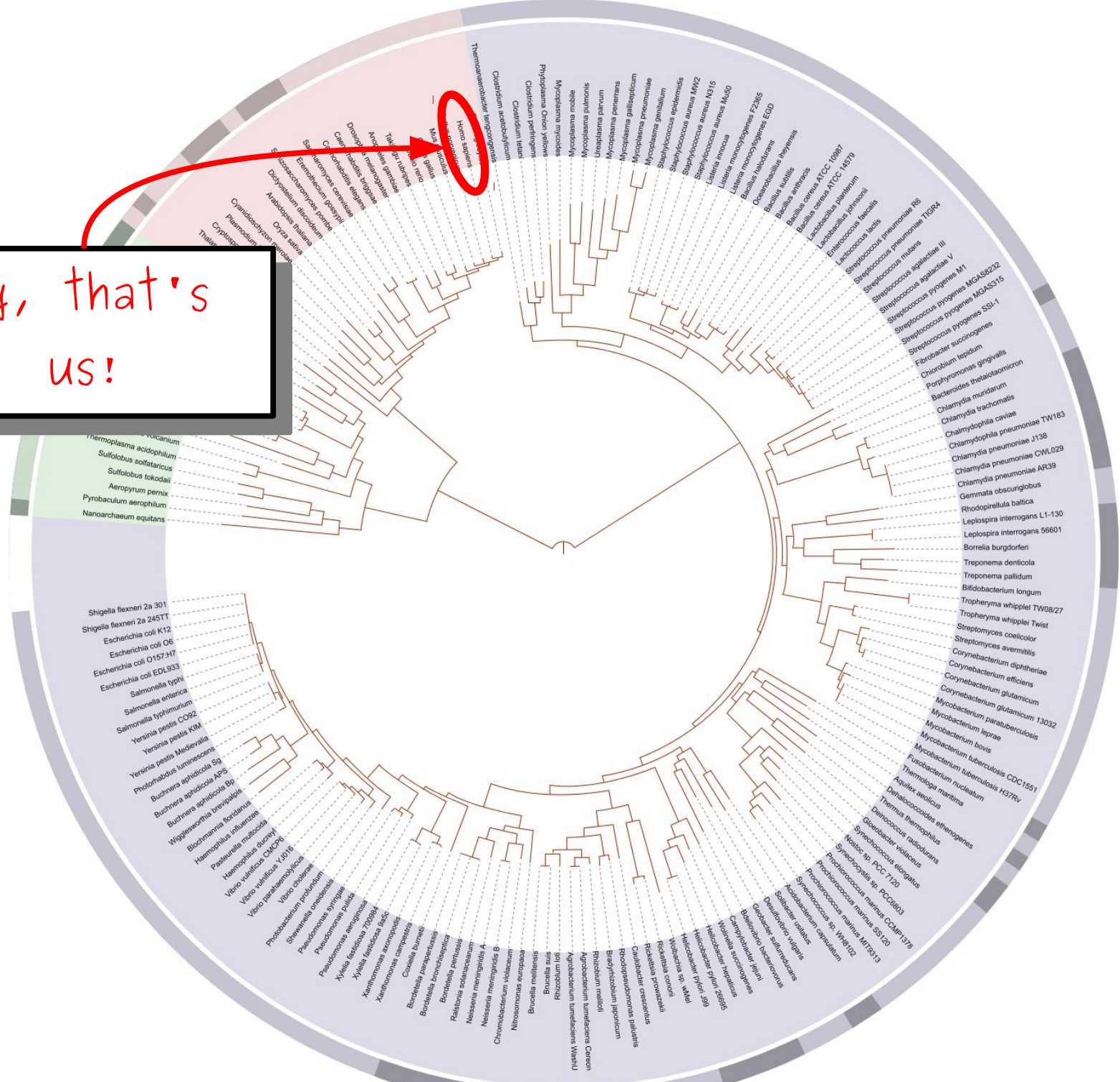


Source: http://alumni.stanford.edu/get/page/magazine/article/?article_id=55993





Hey, that's us!



A

Basic image processing and feature construction:



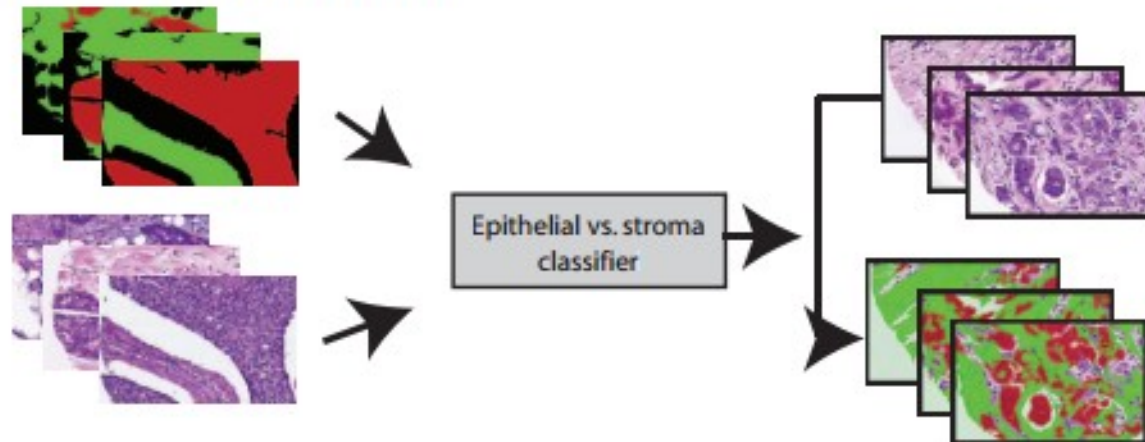
H&E image

Image broken into superpixels

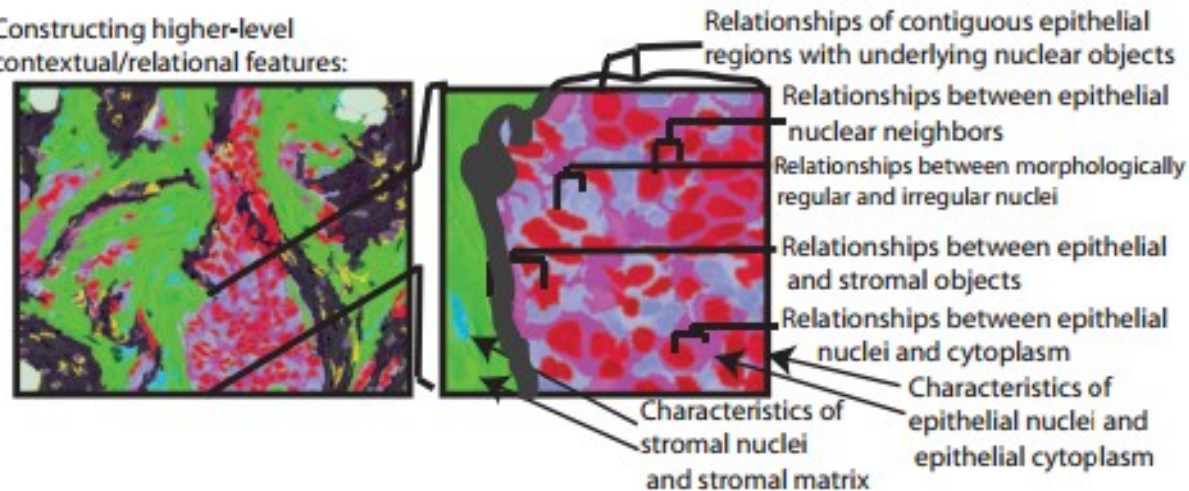
Nuclei identified within each superpixel

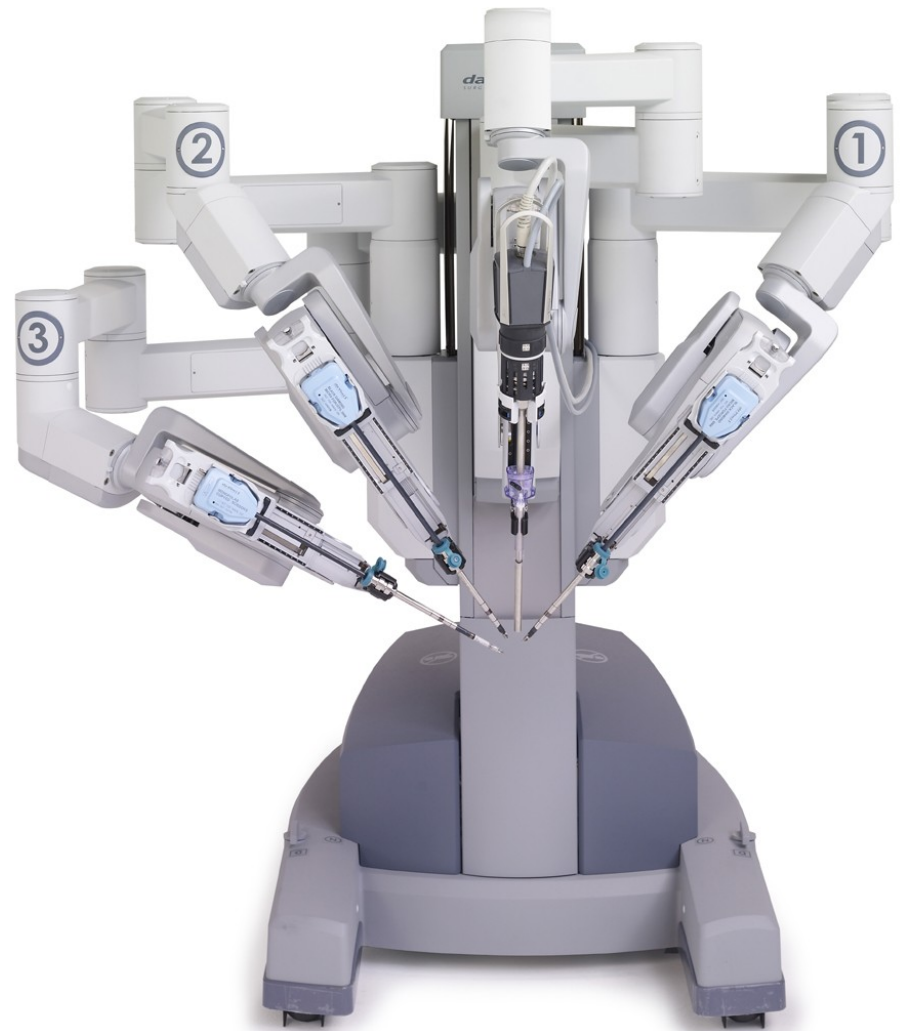
B

Building an epithelial/stromal classifier:

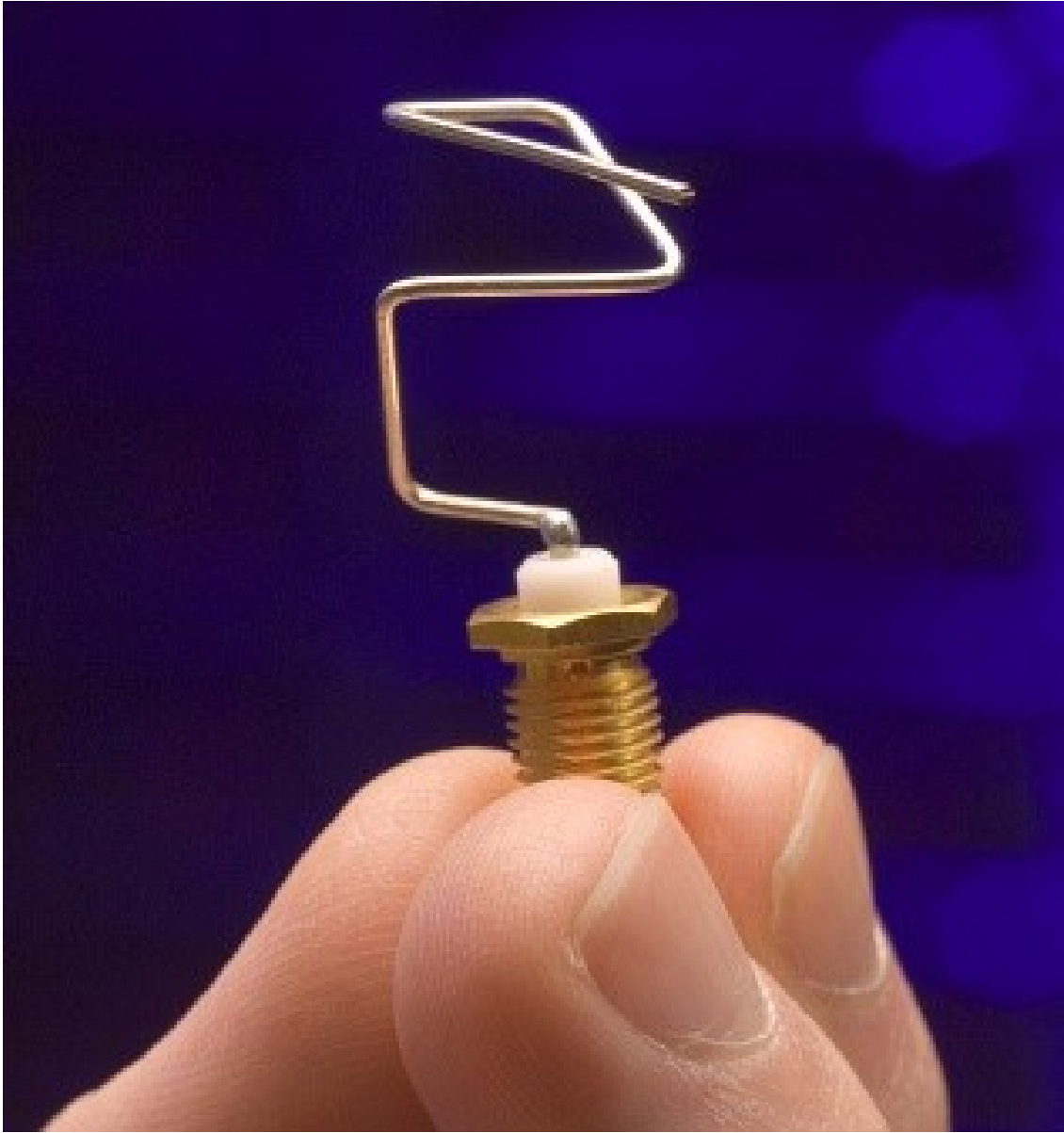
**C**

Constructing higher-level contextual/relational features:











All of these projects occurred
within the last ten years.

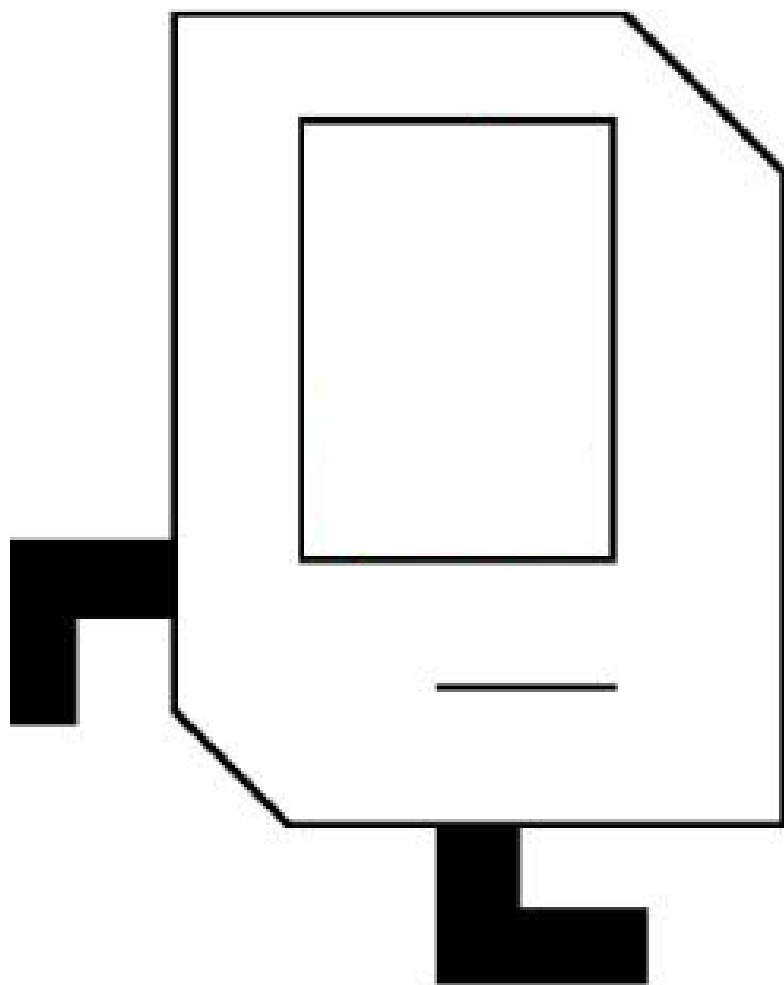
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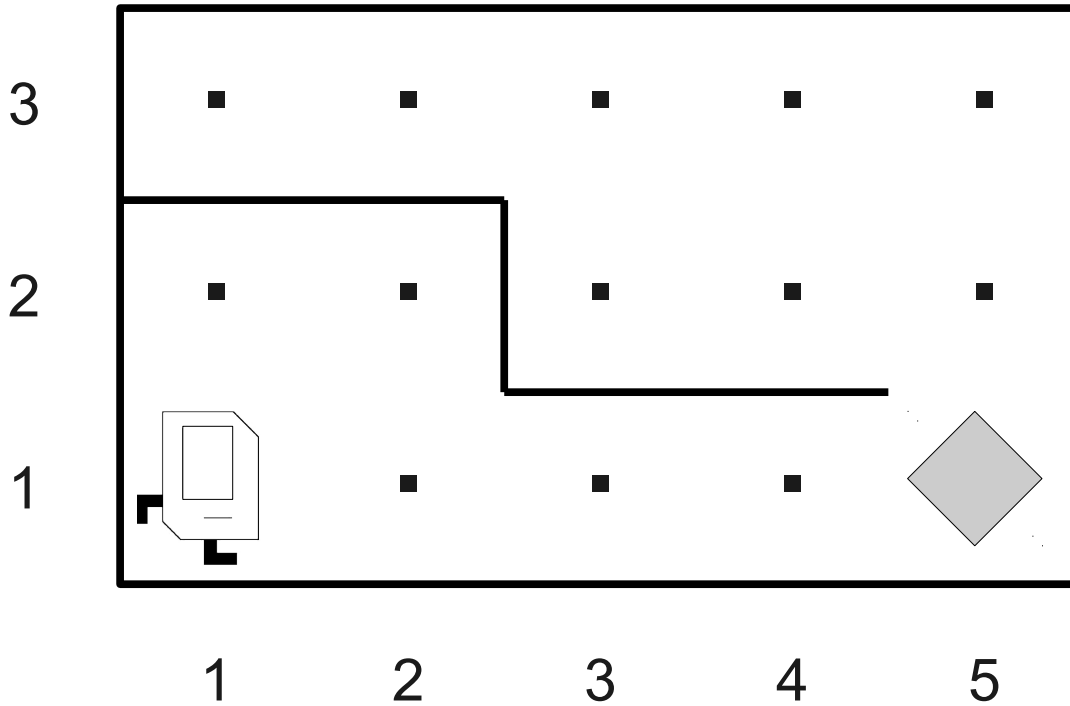
Goals for this Course

- **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.

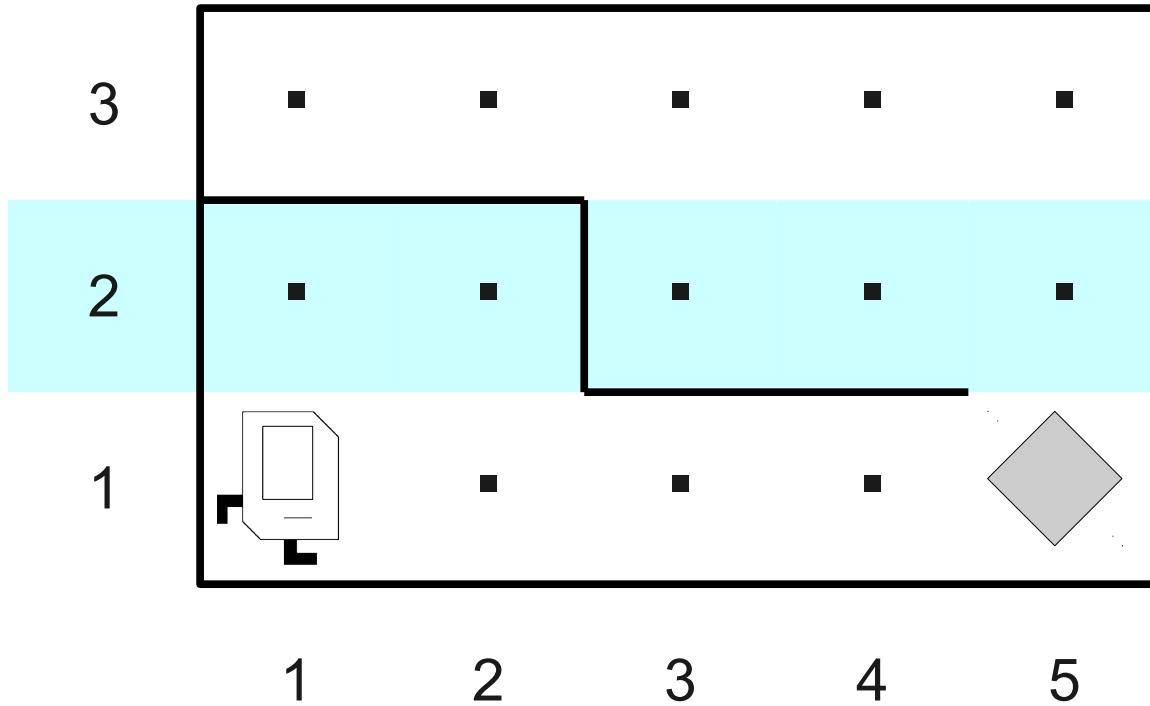
Meet Karel the Robot



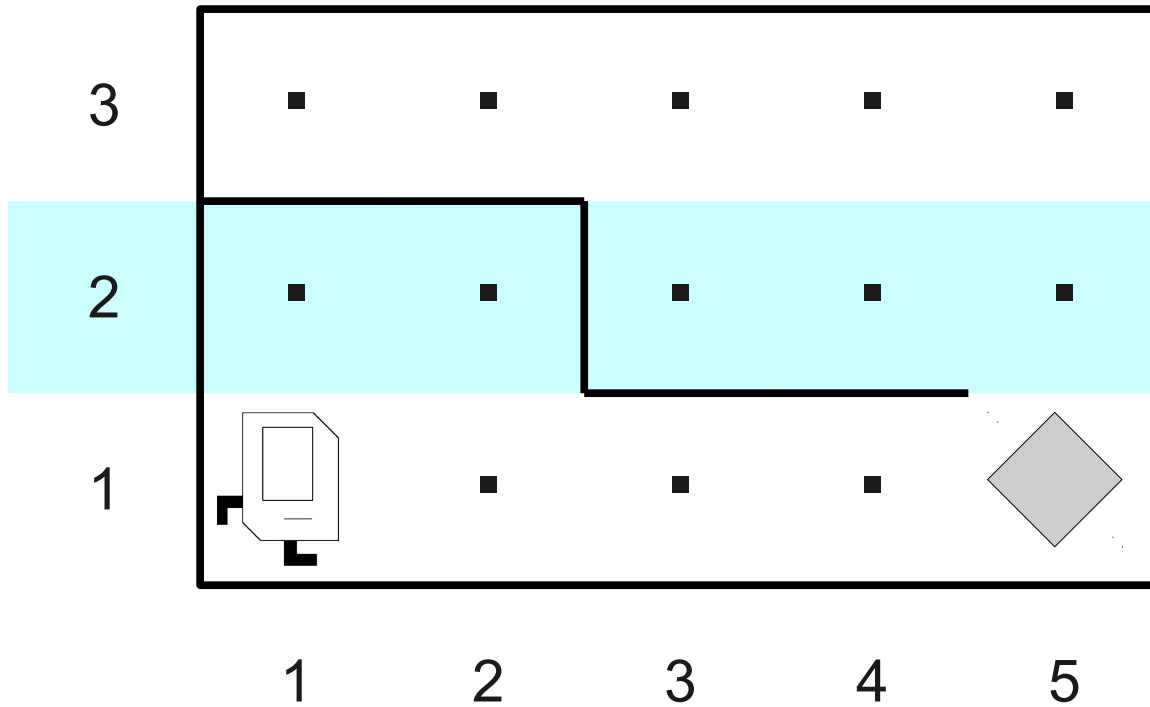
Karel's World



Karel's World

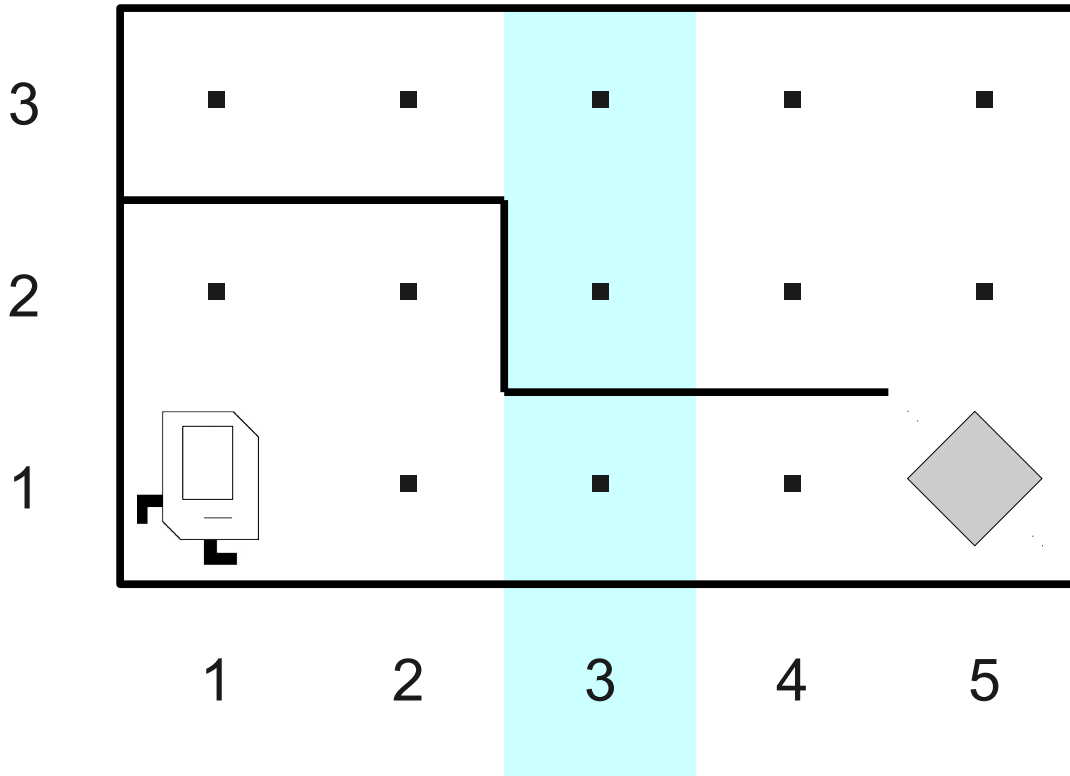


Karel's World

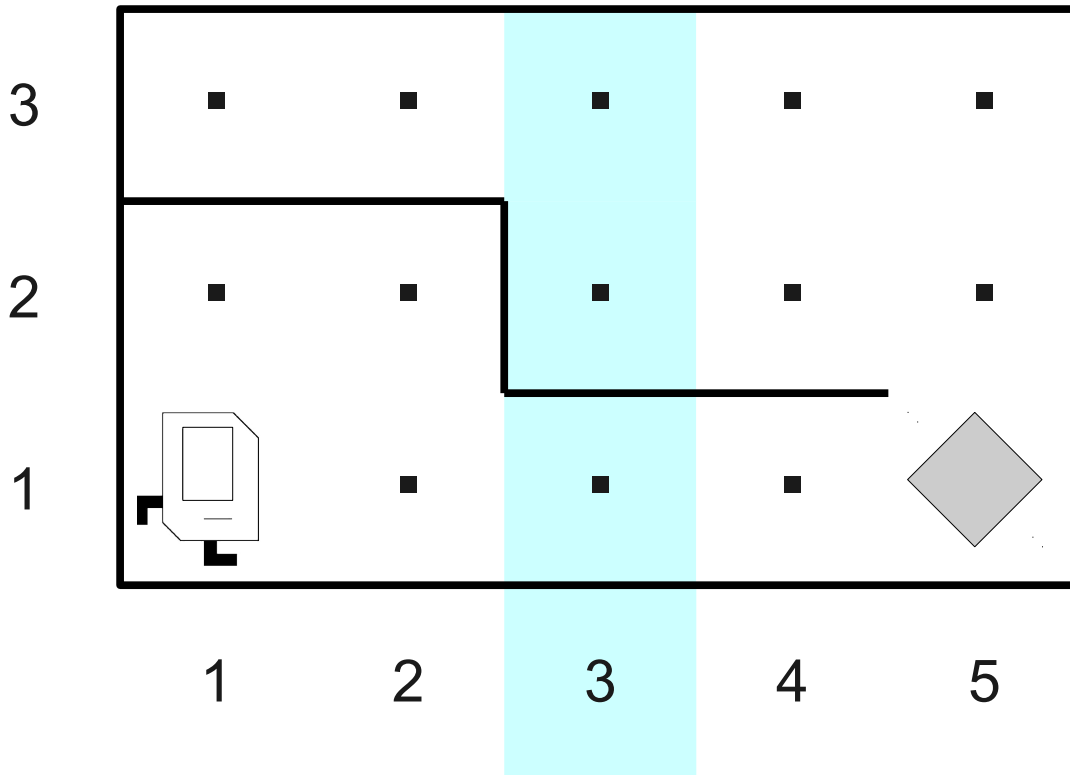


Each row is called a street.

Karel's World

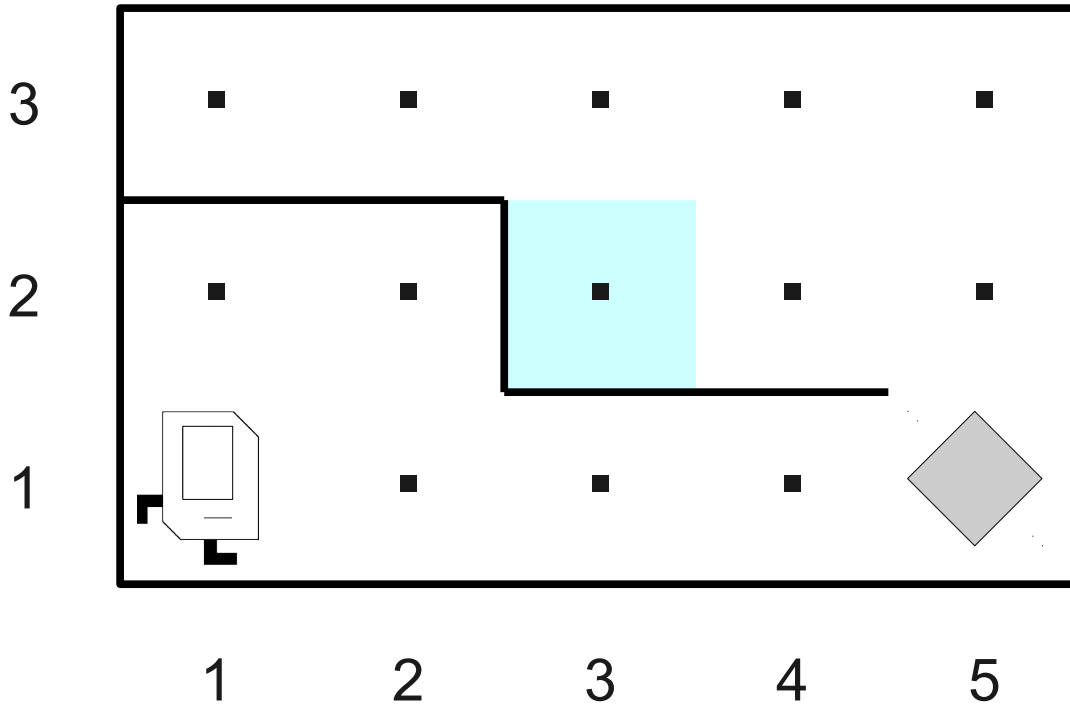


Karel's World

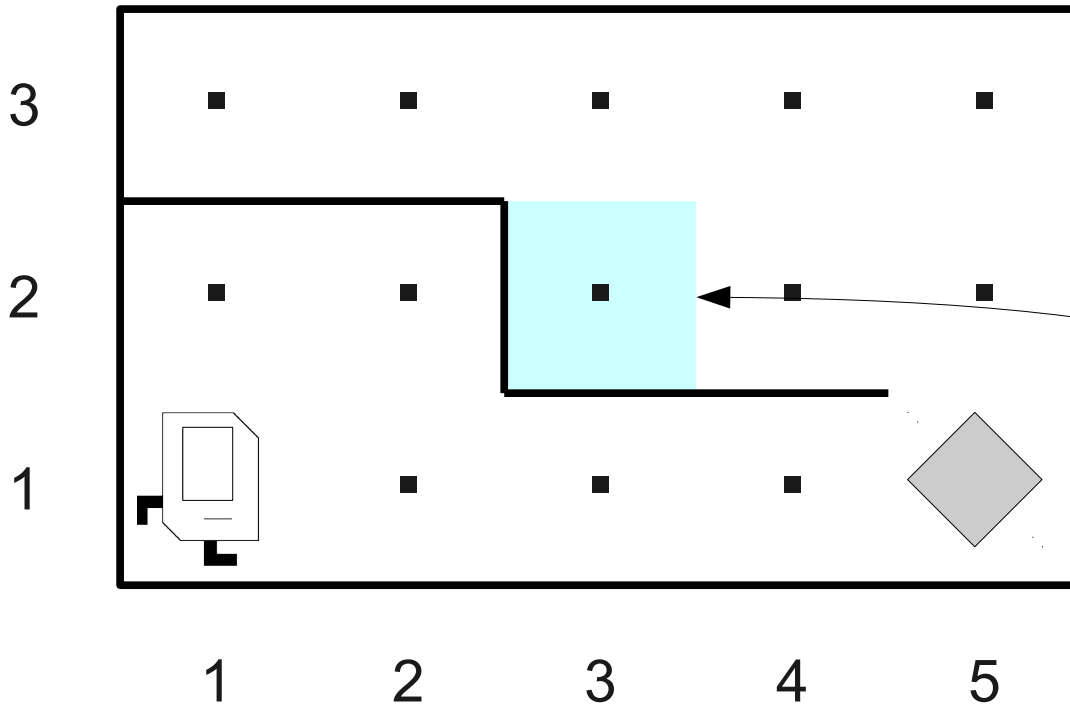


Each column is called an avenue.

Karel's World

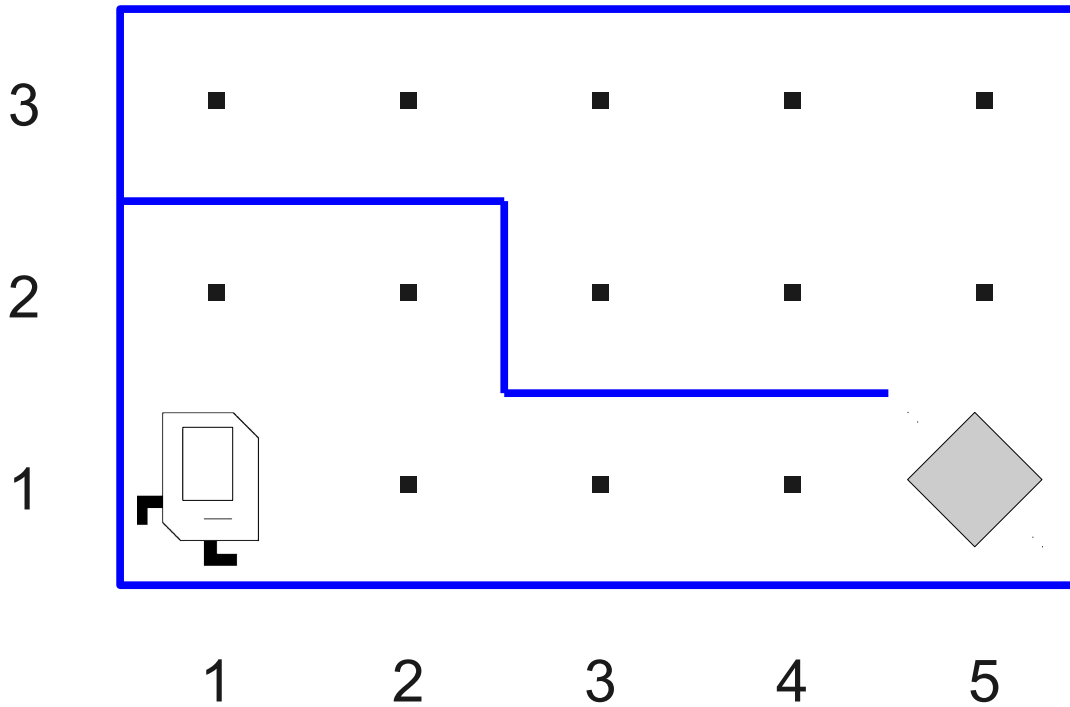


Karel's World

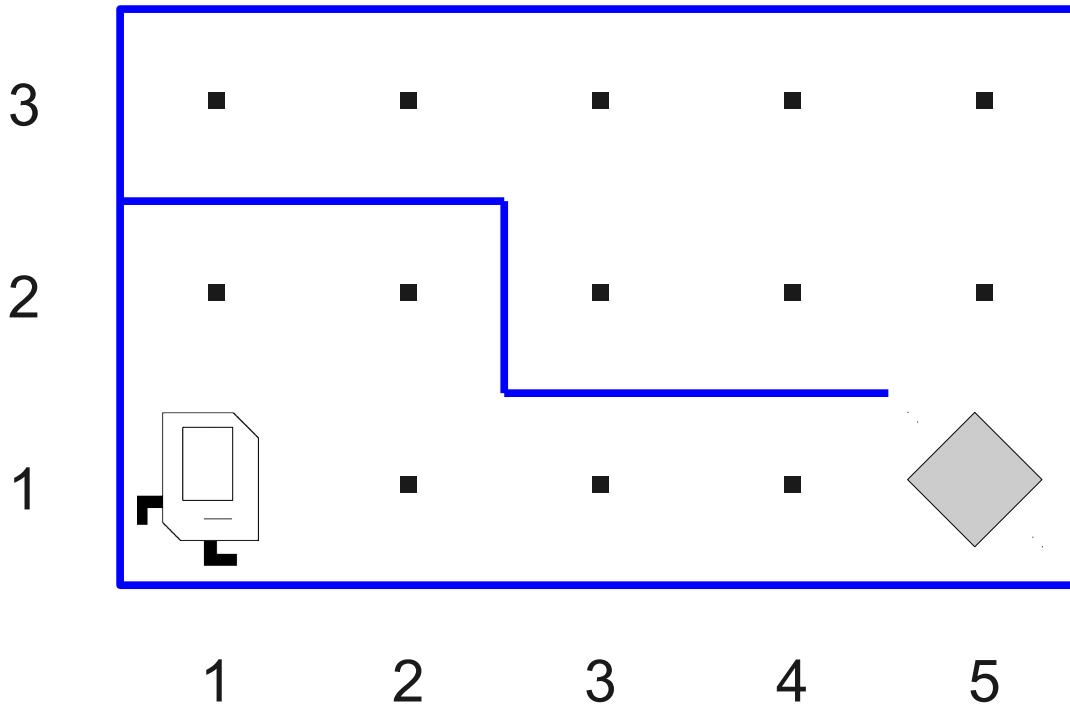


The intersection of a street and an avenue is a corner.

Karel's World

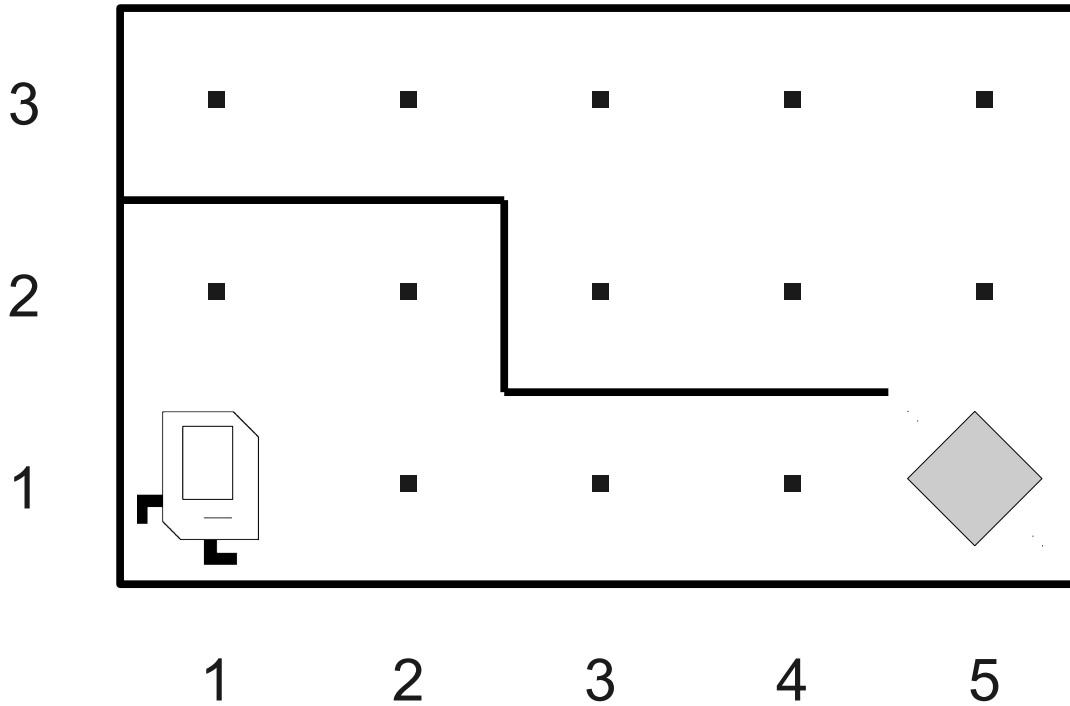


Karel's World

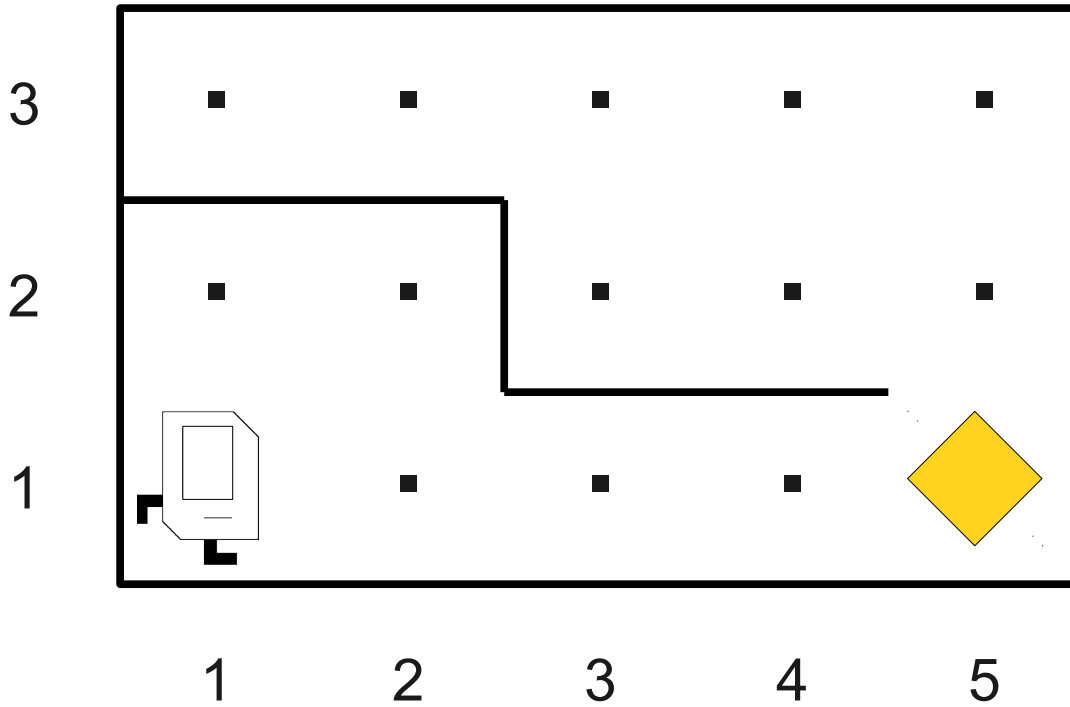


Karel cannot
move through
walls.

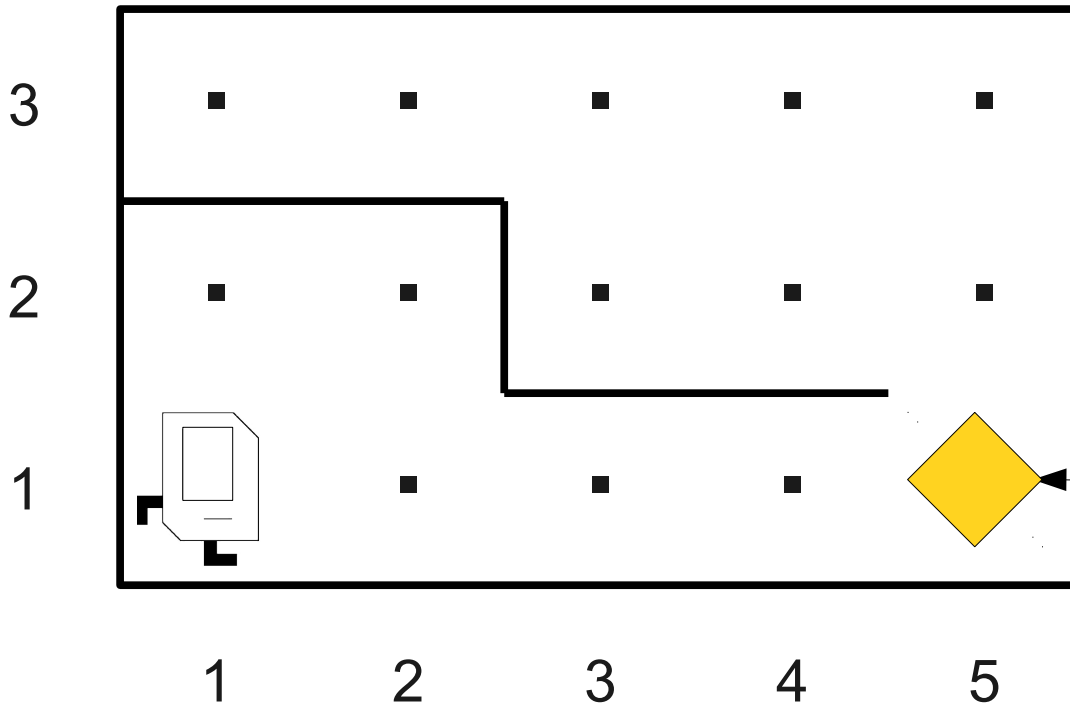
Karel's World



Karel's World

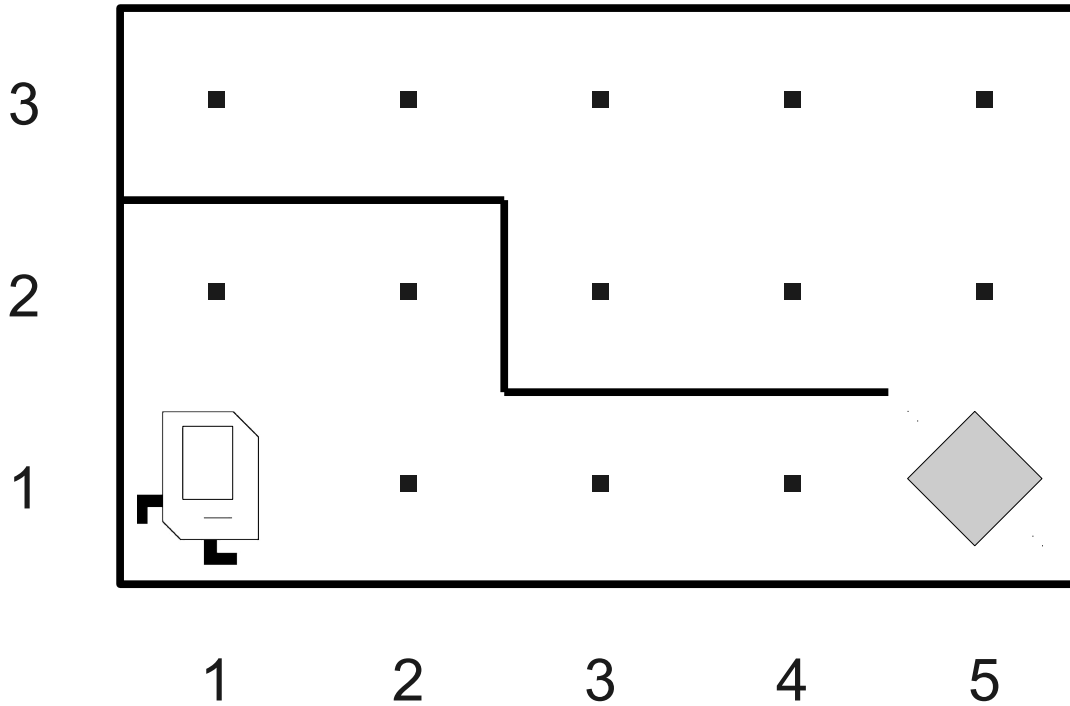


Karel's World

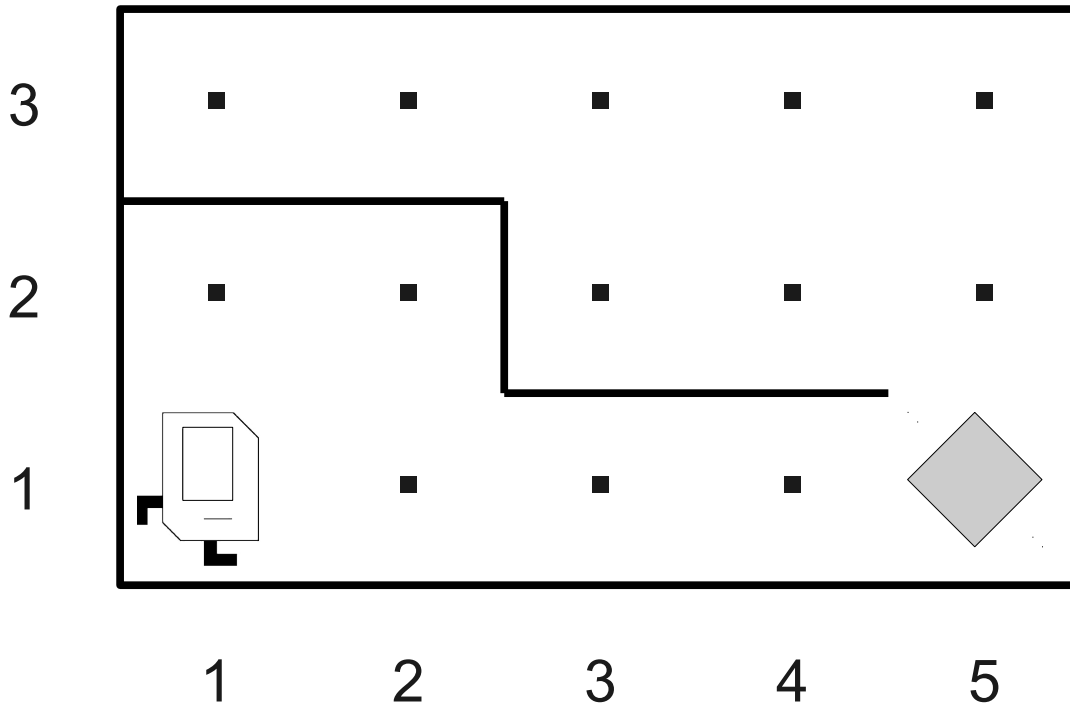


Beepers mark
locations in
Karel's world.

Karel's World

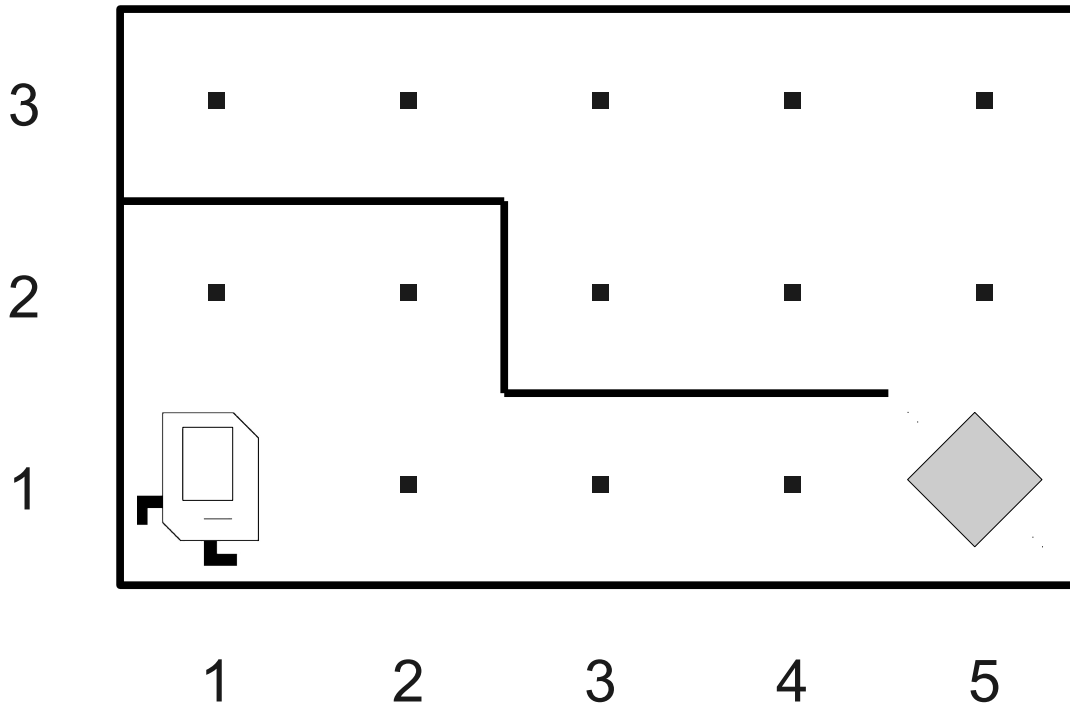


Karel's World



Karel Commands

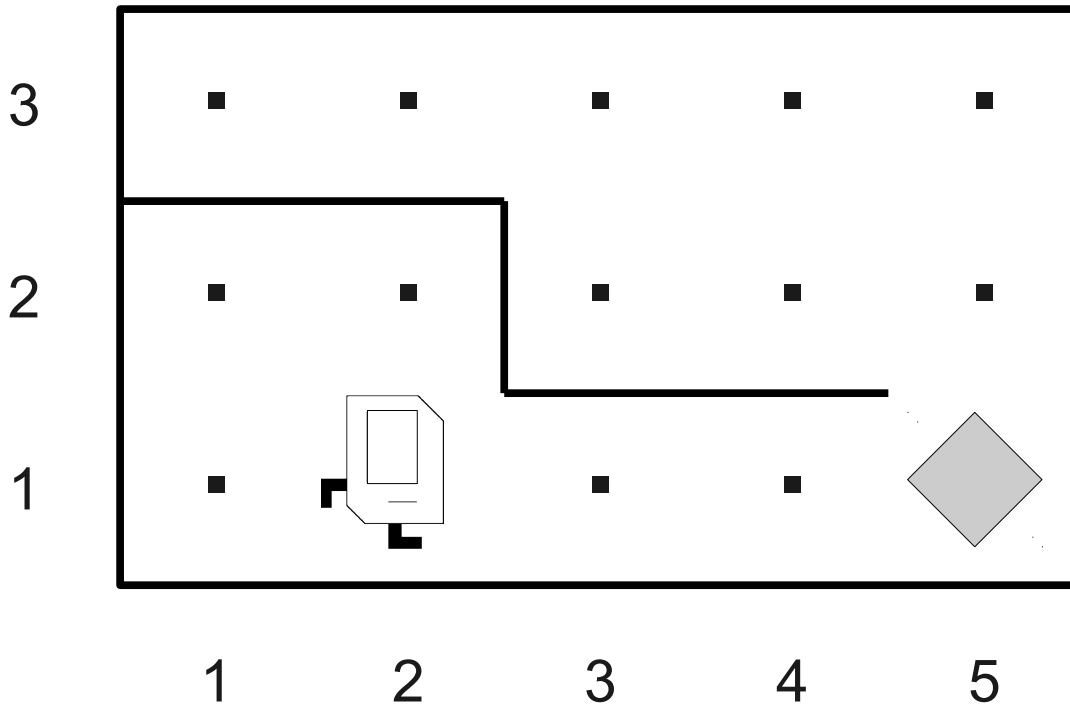
Karel's World



Karel Commands

move

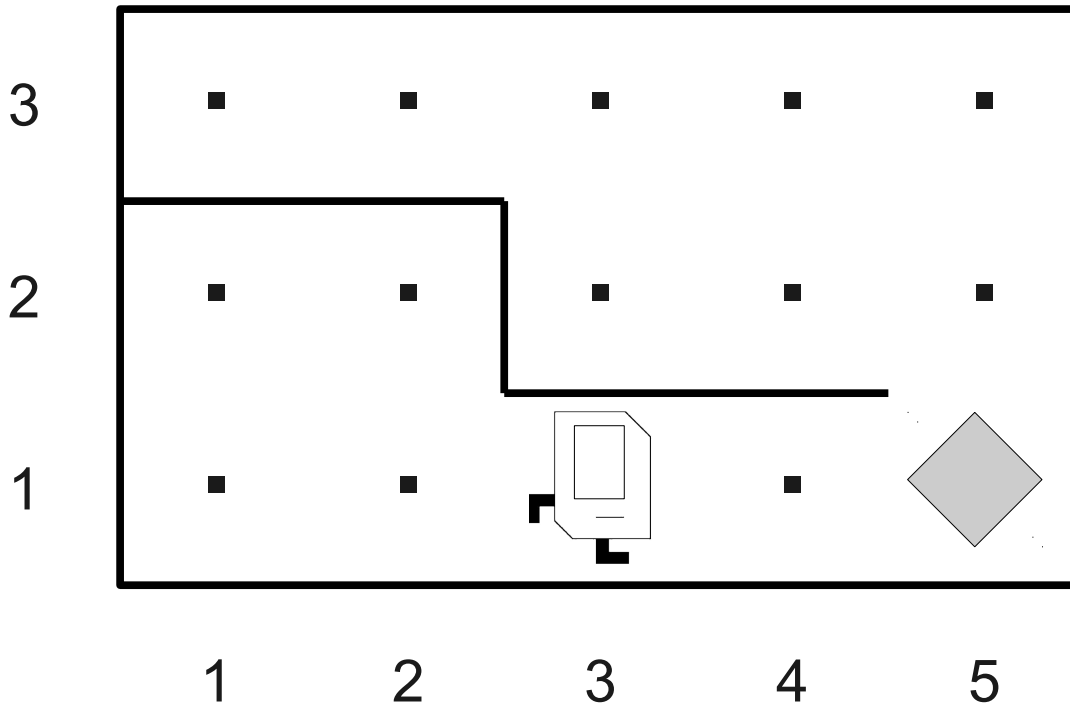
Karel's World



Karel Commands

move

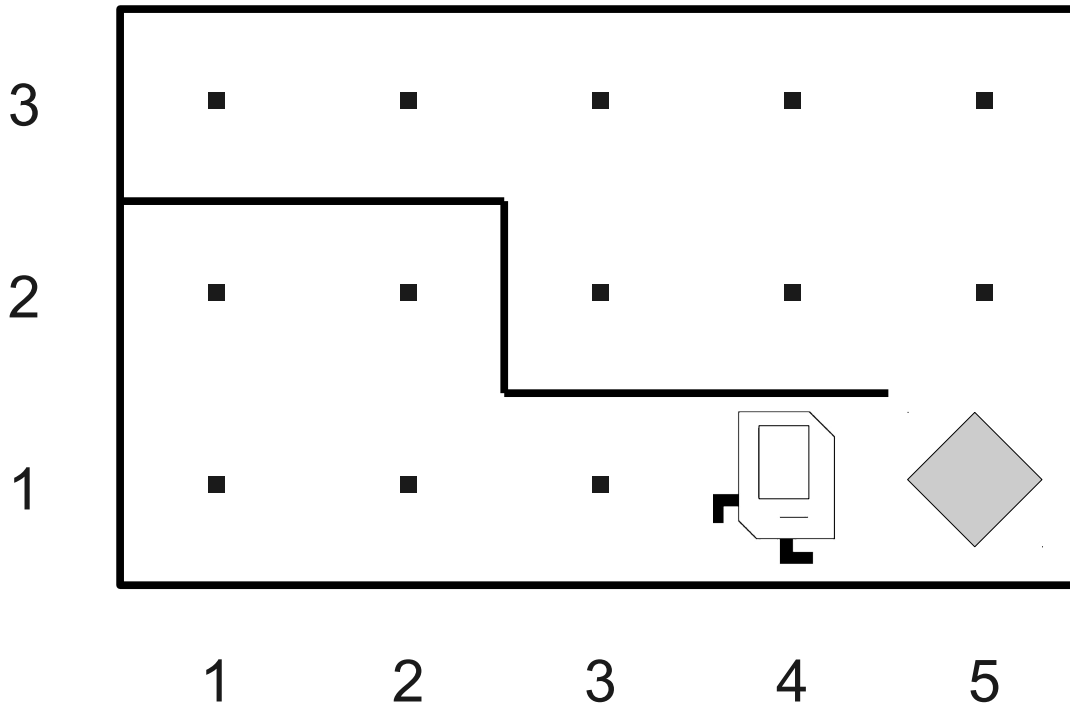
Karel's World



Karel Commands

move

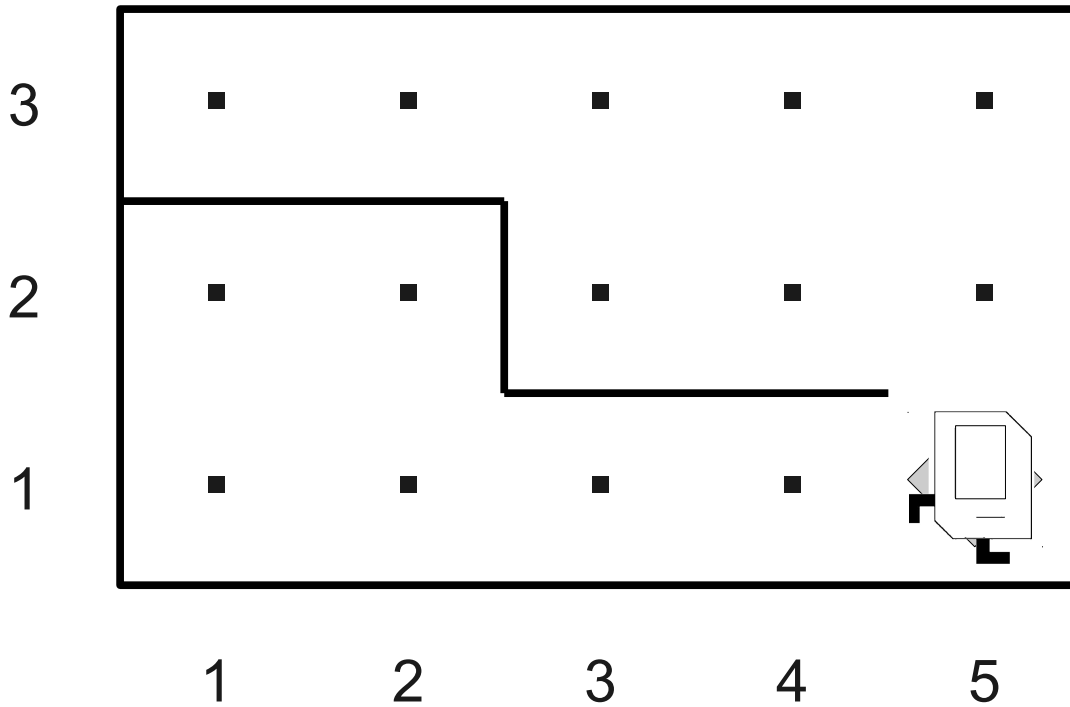
Karel's World



Karel Commands

move

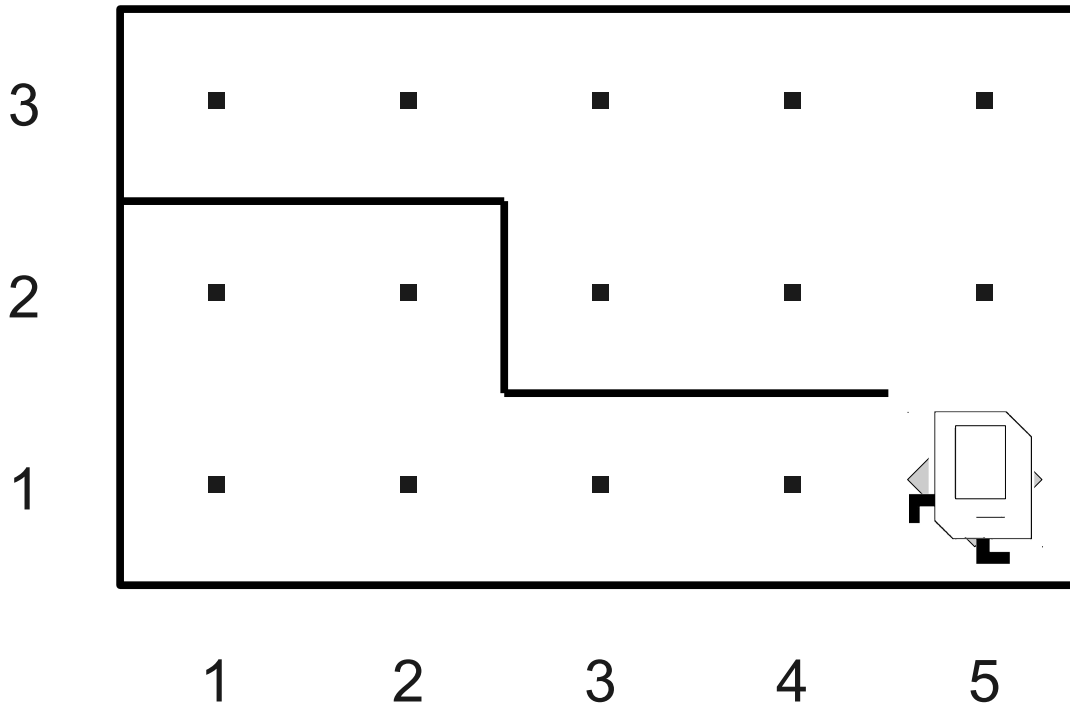
Karel's World



Karel Commands

move

Karel's World

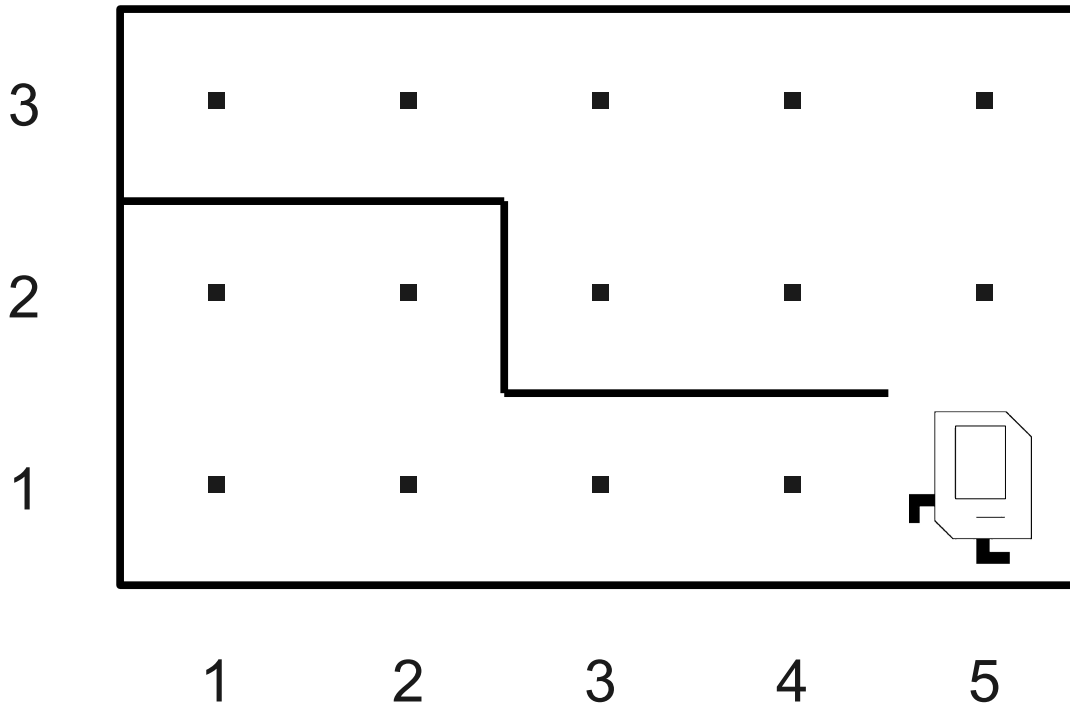


Karel Commands

move

pickBeeper

Karel's World

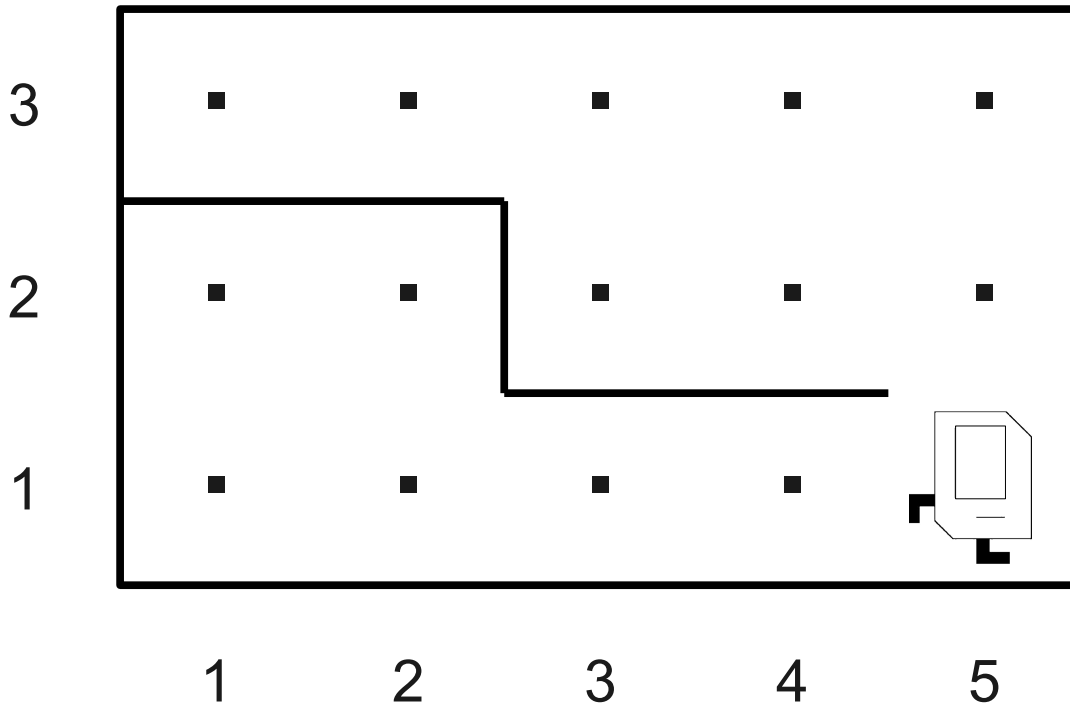


Karel Commands

move

pickBeeper

Karel's World



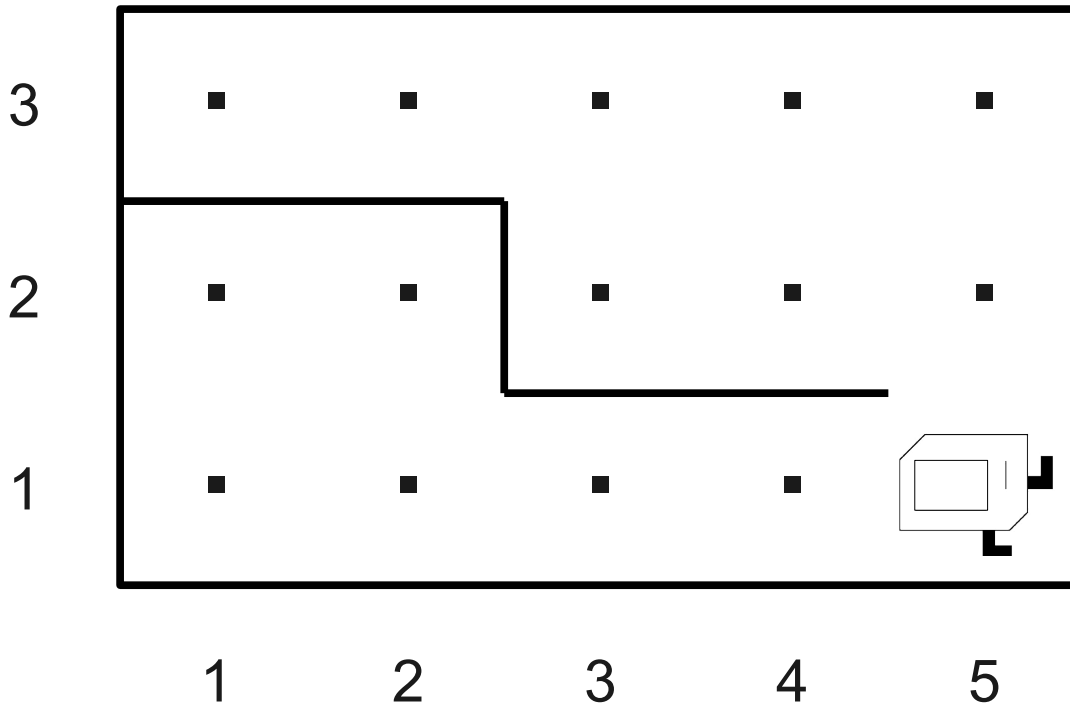
Karel Commands

move

pickBeeper

turnLeft

Karel's World



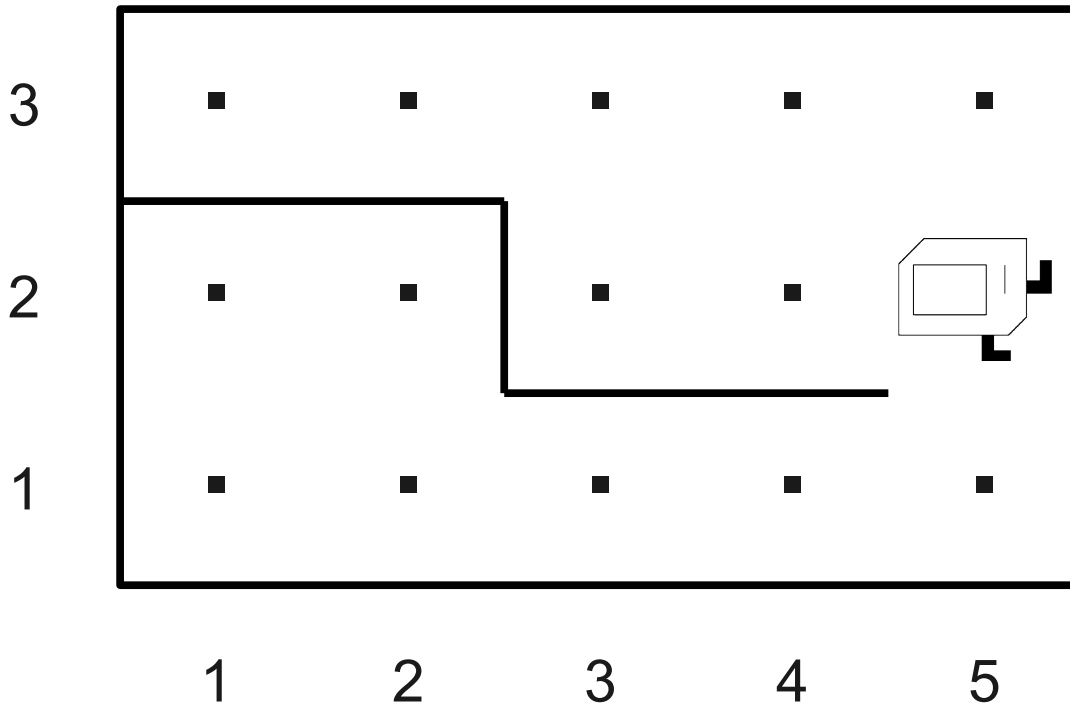
Karel Commands

move

pickBeeper

turnLeft

Karel's World



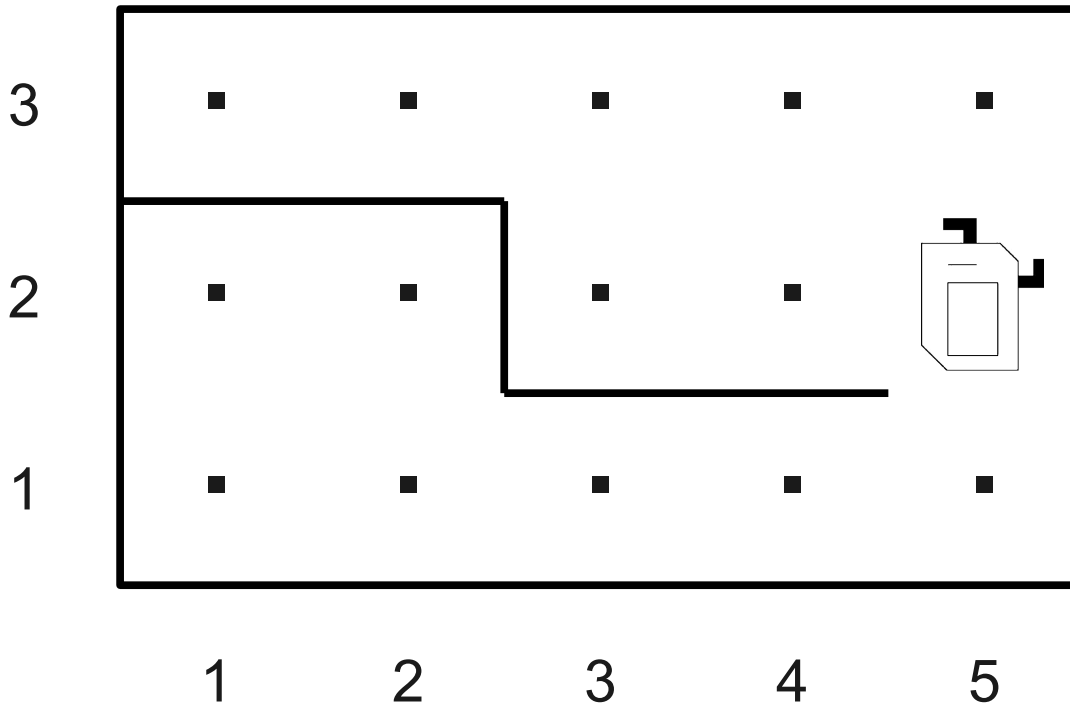
Karel Commands

move

pickBeeper

turnLeft

Karel's World



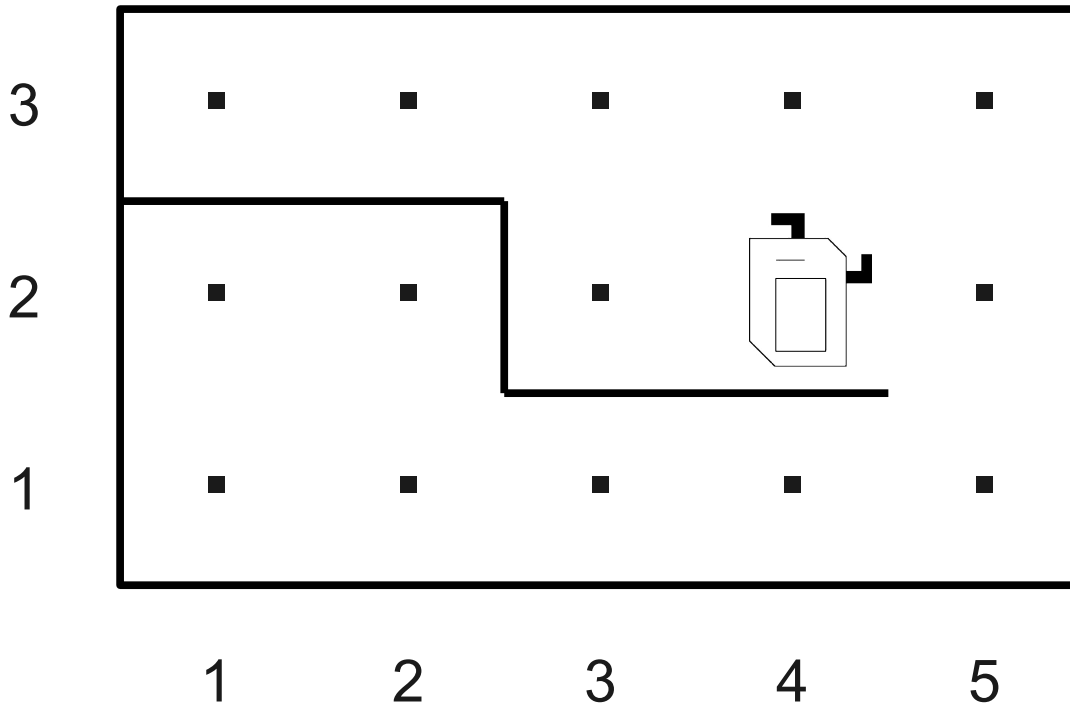
Karel Commands

move

pickBeeper

turnLeft

Karel's World



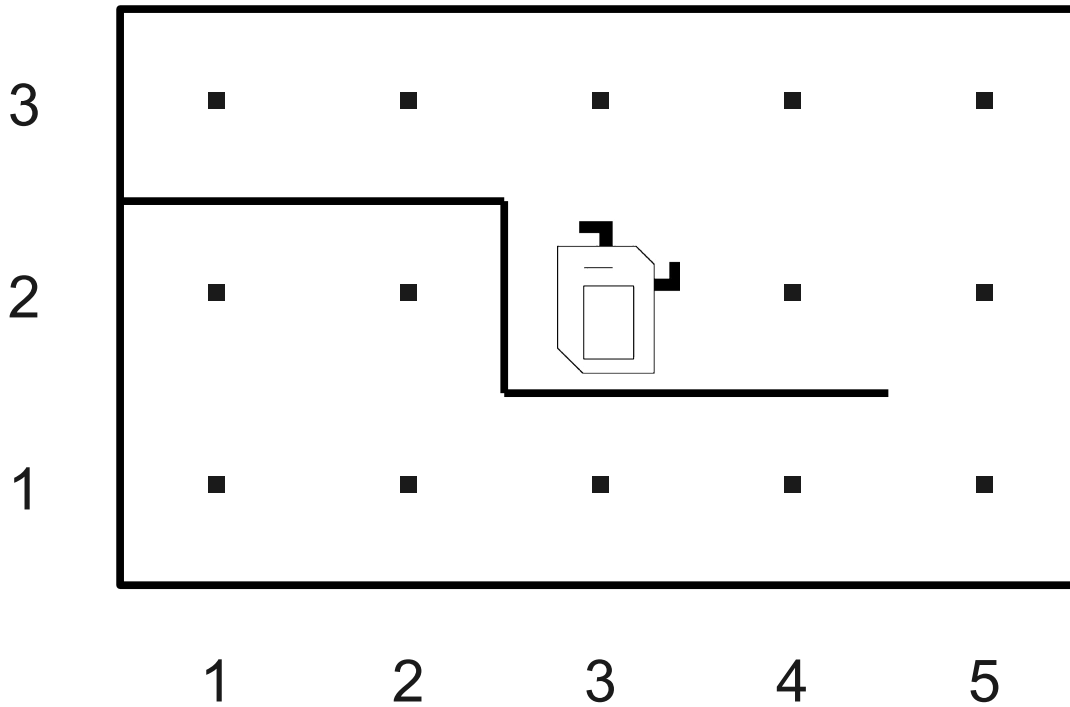
Karel Commands

move

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Karel's World



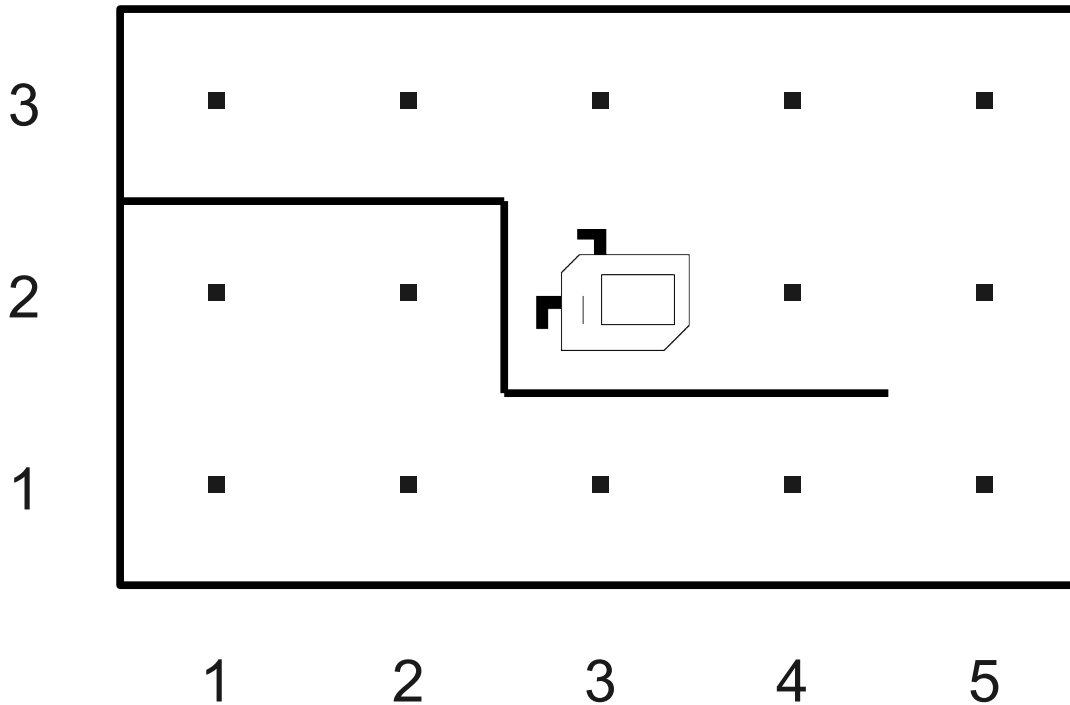
Karel Commands

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Karel's World



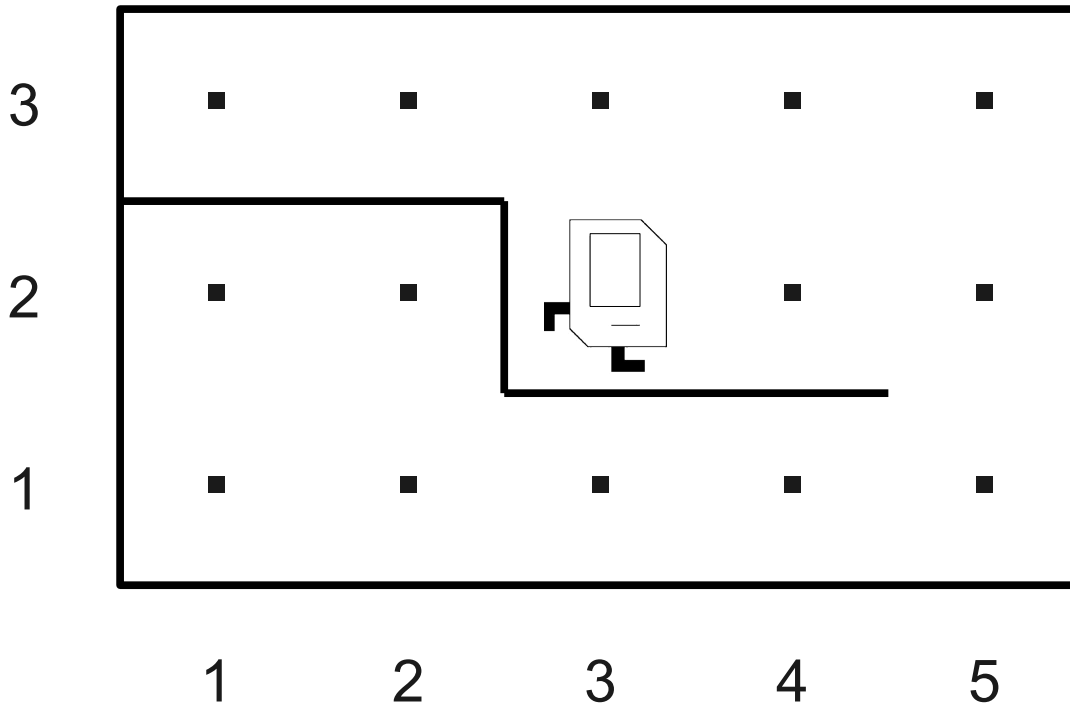
Karel Commands

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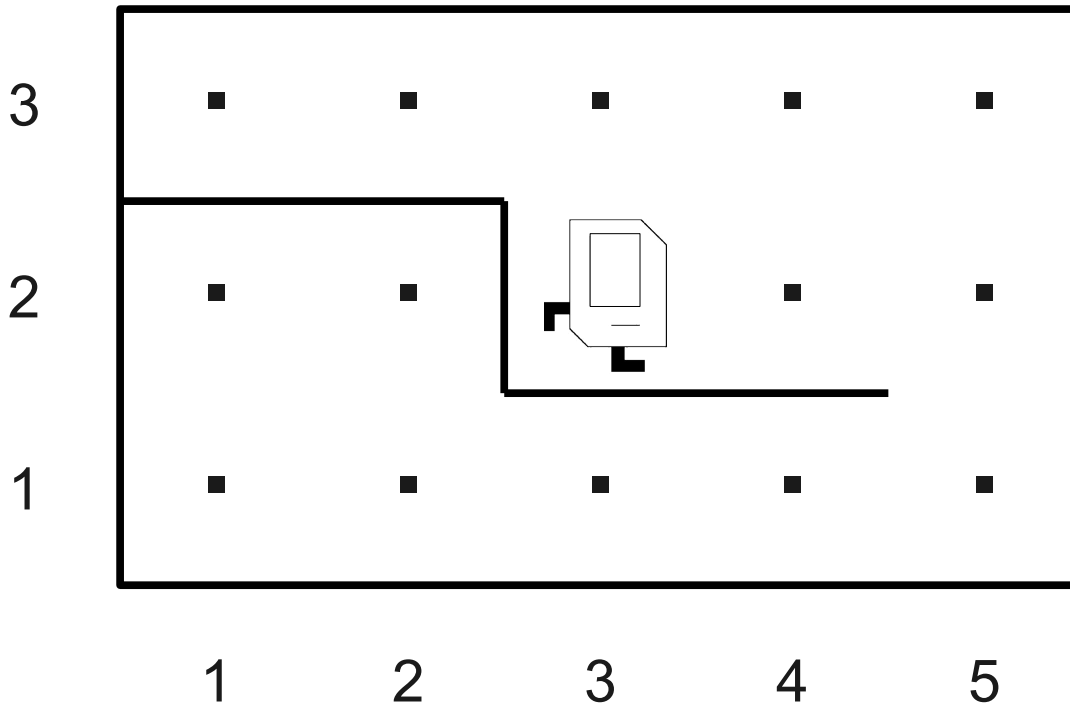
Karel Commands

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Karel Commands

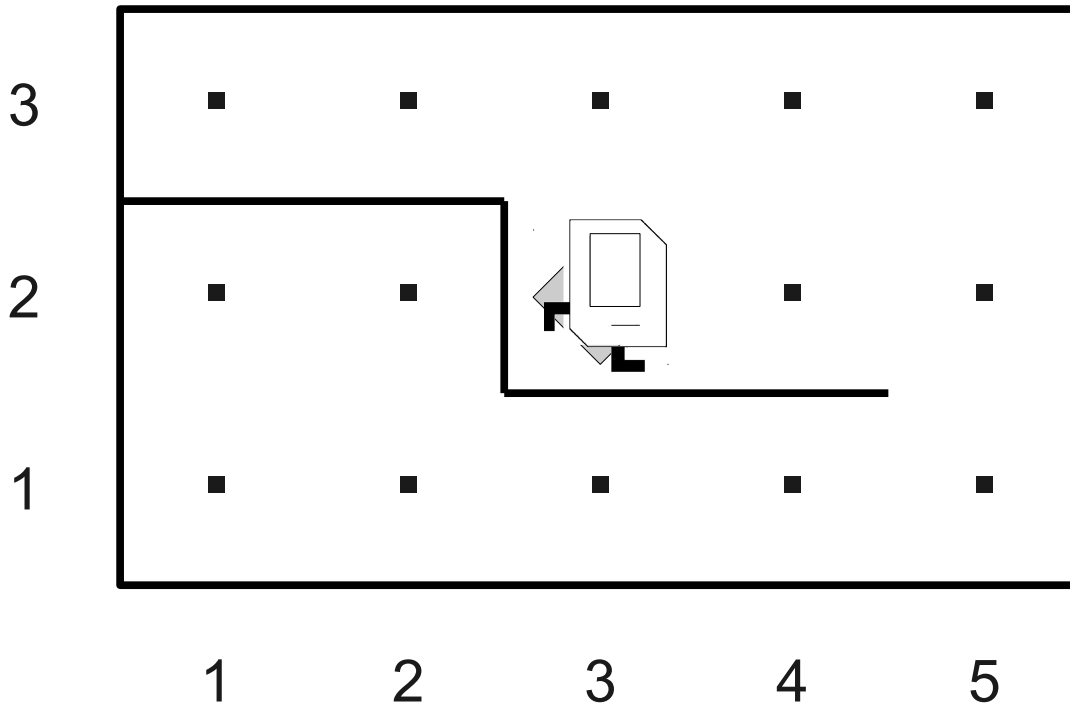
move

pickBeeper

turnLeft

putBeeper

Karel's World



Karel Commands

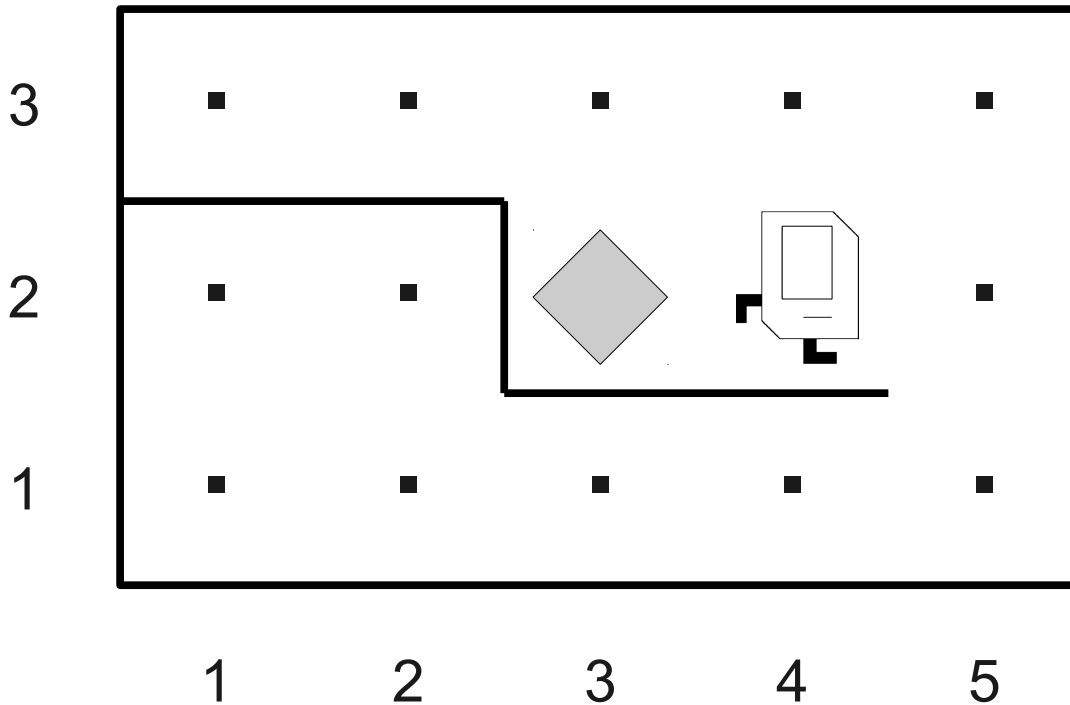
move

pickBeeper

turnLeft

putBeeper

Karel's World



Karel Commands

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turnLeft

putBeeper

Get Ready!

It's Time for Your
Very First Karel Program!