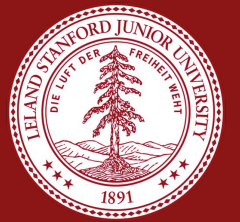
# Welcome to CS106A

## Lecture 1

CS106A, Summer 2019

Sarai Gould & Laura Cruz-Albrecht



# Plan for Today

- Introductions
- Course Logistics
- Meet Karel the Robot

# Who Are We?

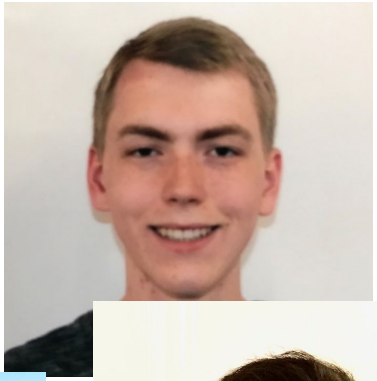
**Sarai Gould**

B.S  Symbolic Systems ‘16
CS Specialist @ Synapse School

**Laura Cruz-Albrecht**

B.S.  Computer Science ‘18
M.S. Computer Science ‘19

# Section Leaders



# What is CS106A?

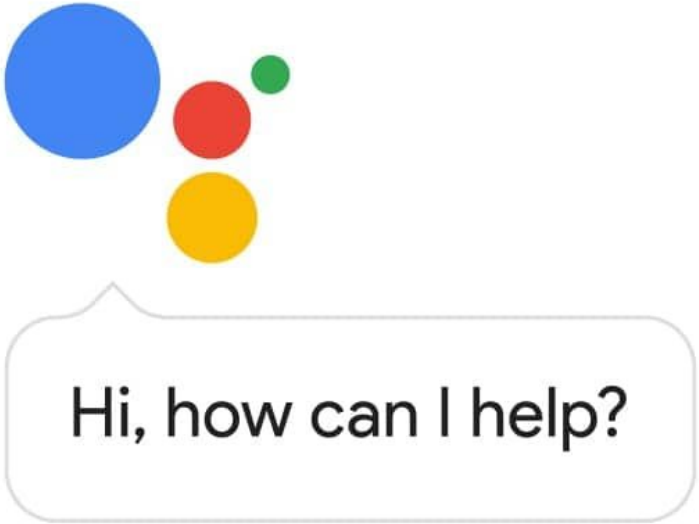
# What is Computer Science?

- The art of using computing to solve complex problems
  - Specify *instructions* that computers execute, usually in a *programming language*
- Applicable to art, medicine, linguistics, and more
- Touches many aspects of our daily lives

There are many *awesome* programs you may one day write...

# Computer Graphics

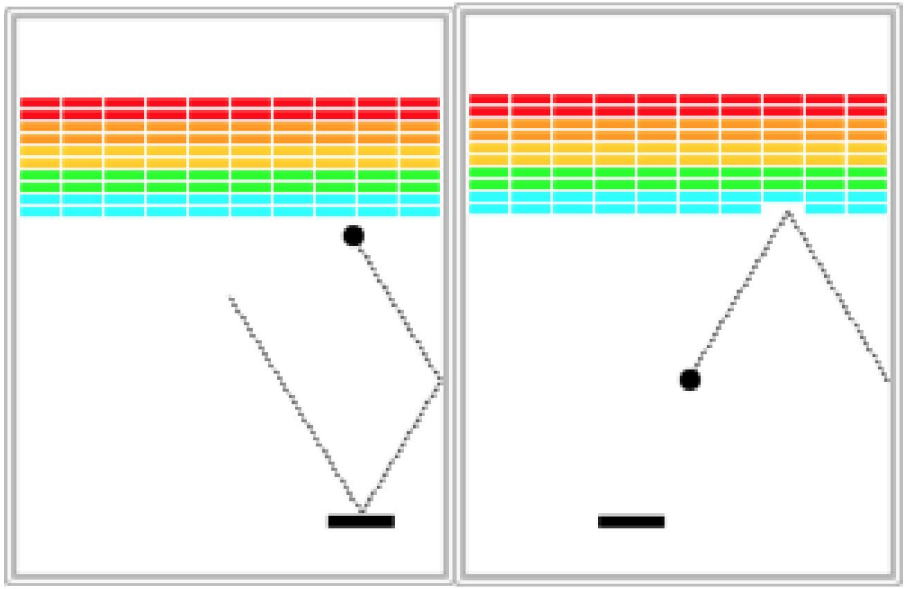
# Personal Assistants

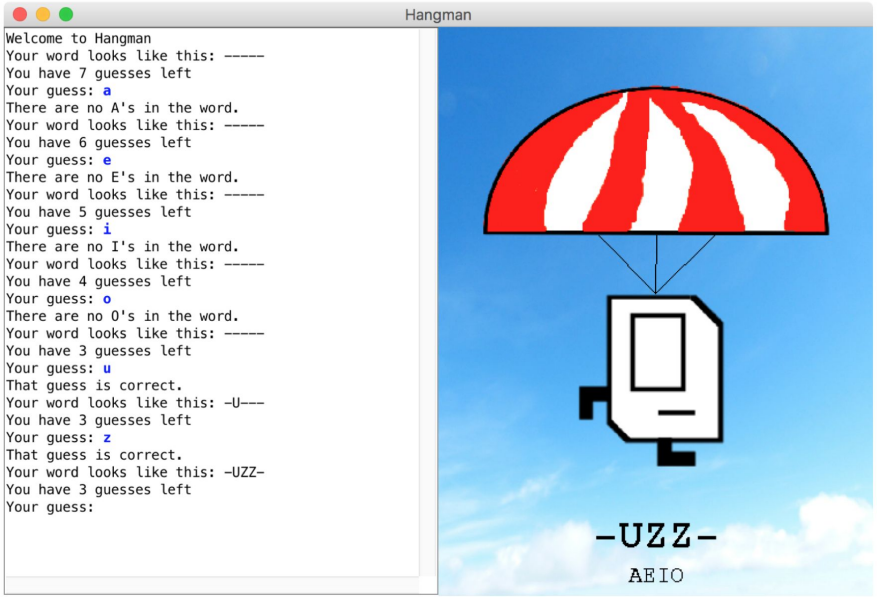


# Autonomous Surgery

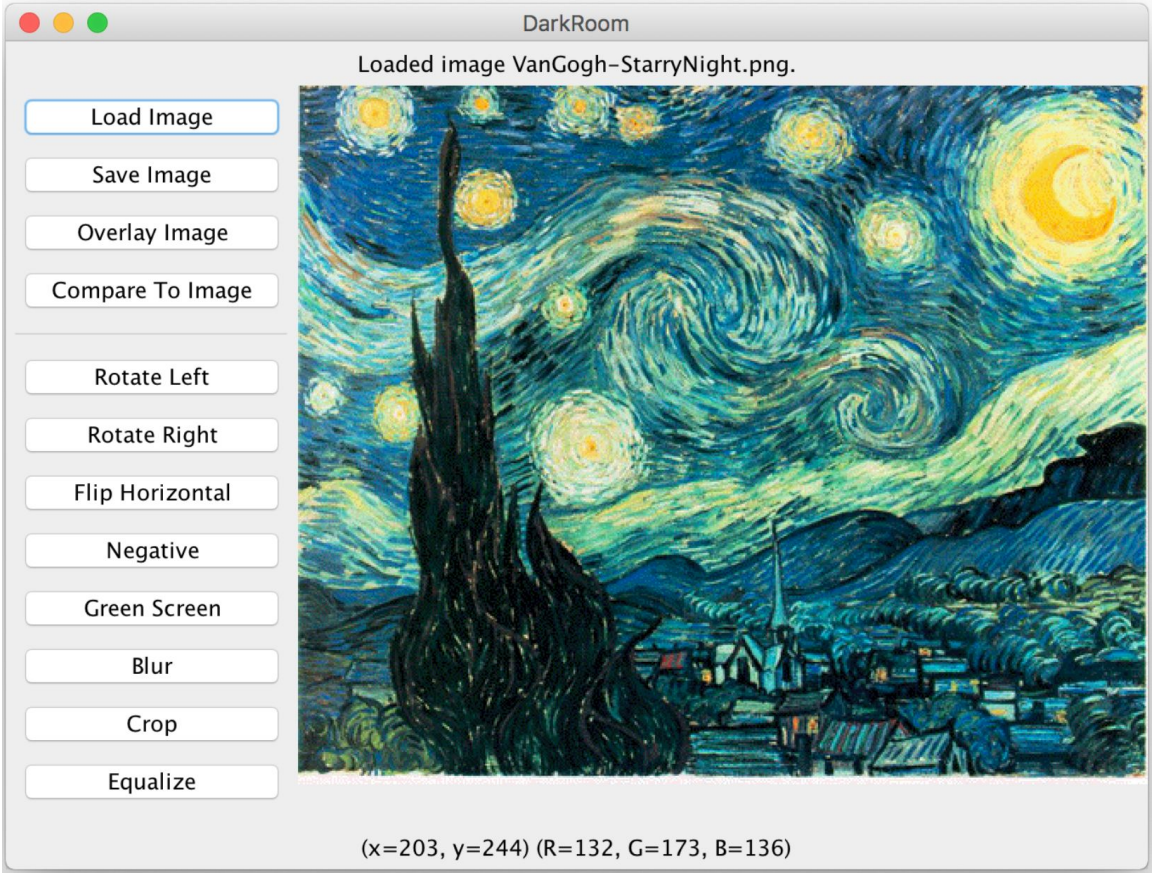
# Self Driving Cars

# Games




Hangman
Welcome to Hangman
Your word looks like this: -----
You have 7 guesses left
Your guess: a
There are no A's in the word.
Your word looks like this: -----
You have 6 guesses left
Your guess: e
There are no E's in the word.
Your word looks like this: -----
You have 5 guesses left
Your guess: i
There are no I's in the word.
Your word looks like this: -----
You have 4 guesses left
Your guess: o
There are no O's in the word.
Your word looks like this: -----
You have 3 guesses left
Your guess: u
That guess is correct.
Your word looks like this: -U---
You have 3 guesses left
Your guess: z
That guess is correct.
Your word looks like this: -UZZ-
You have 3 guesses left
Your guess:
-UZZ-
AEIO

# Image Processing



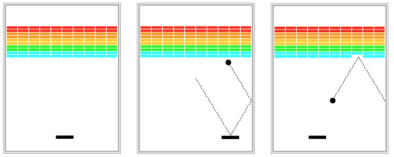
# Internet Applications


FacePamphletServer

```
Starting server on port 8000...
addProfile (name=Mehran)
  => success
addProfile (name=Chris)
  => success
addProfile (name=Chris)
  => Error: Database already contains Chris.
getStatus (name=Chris)
  => none
setStatus (name=Chris, status=teaching)
  => success
getStatus (name=Chris)
  => teaching
addFriend (name2=Mehran, name1=Chris)
  => success
getFriends (name=Chris)
  => [Mehran]
addProfile (name=Julie)
  => success
getImg (name=Julie)
  => none
getStatus (name=Julie)
  => none
getFriends (name=Julie)
  => []
setImg (img=JulieZ.jpg, name=Julie)
  => success
getImg (name=Julie)
  => JulieZ.jpg
getStatus (name=Julie)
  => none
getFriends (name=Julie)
  => []
addFriend (name2=Chris, name1=Julie)
  => success
getImg (name=Julie)
  => JulieZ.jpg
getStatus (name=Julie)
  => none
```

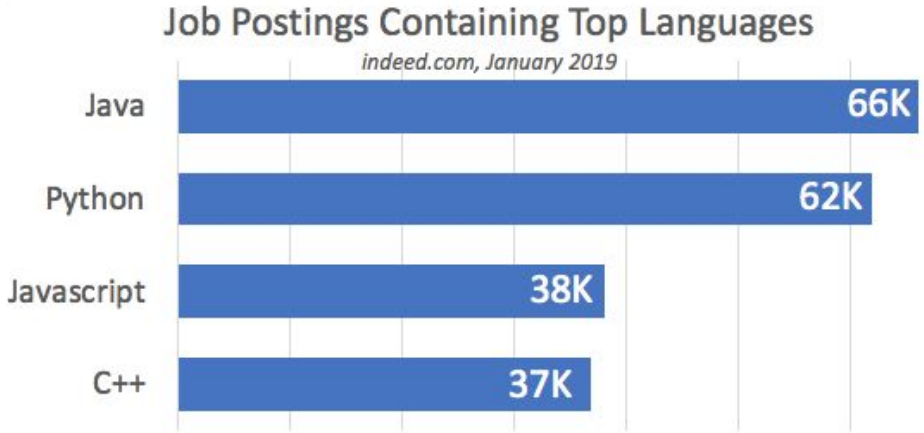
# What is CS106A?

- **Programming *Methodology***
  - Focus on computational problem solving, not syntax
  - Develop good software engineering style
  - Use the **Java** programming language
  - No former programming experience required
- Topics include
  - Karel the Robot
  - Text-based programs
  - Graphics and animation
  - Games
  - And more...



# Why Java?

1




2

https://www.codingdojo.com/blog/the-7-most-in-demand-programming-languages-of-2019

# Plan for Today

- Introductions
- Course Logistics
- Meet Karel the Robot

# Course Logistics

**Course Website:**

http://cs106a.stanford.edu

**Lectures:**

M-Th, 10:30am - 11:20am in Bishop Auditorium

**Exams:**

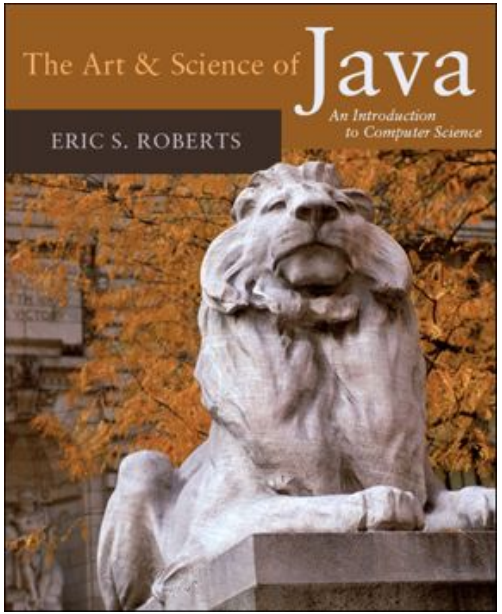
*Midterm:* Monday, July 22nd, 7pm - 9pm

*Final:* Saturday, August 17th, 8:30am - 11:30am

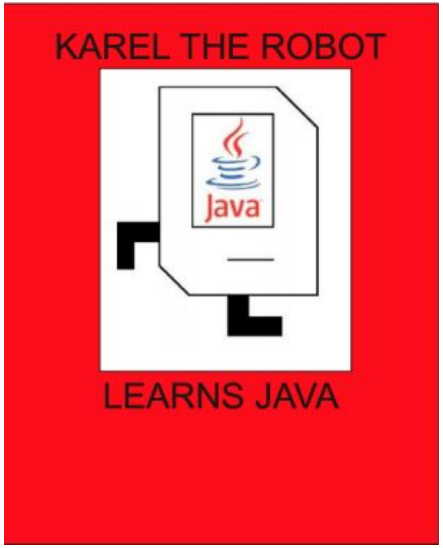
# Units

# Course Materials

**Art and Science of Java**

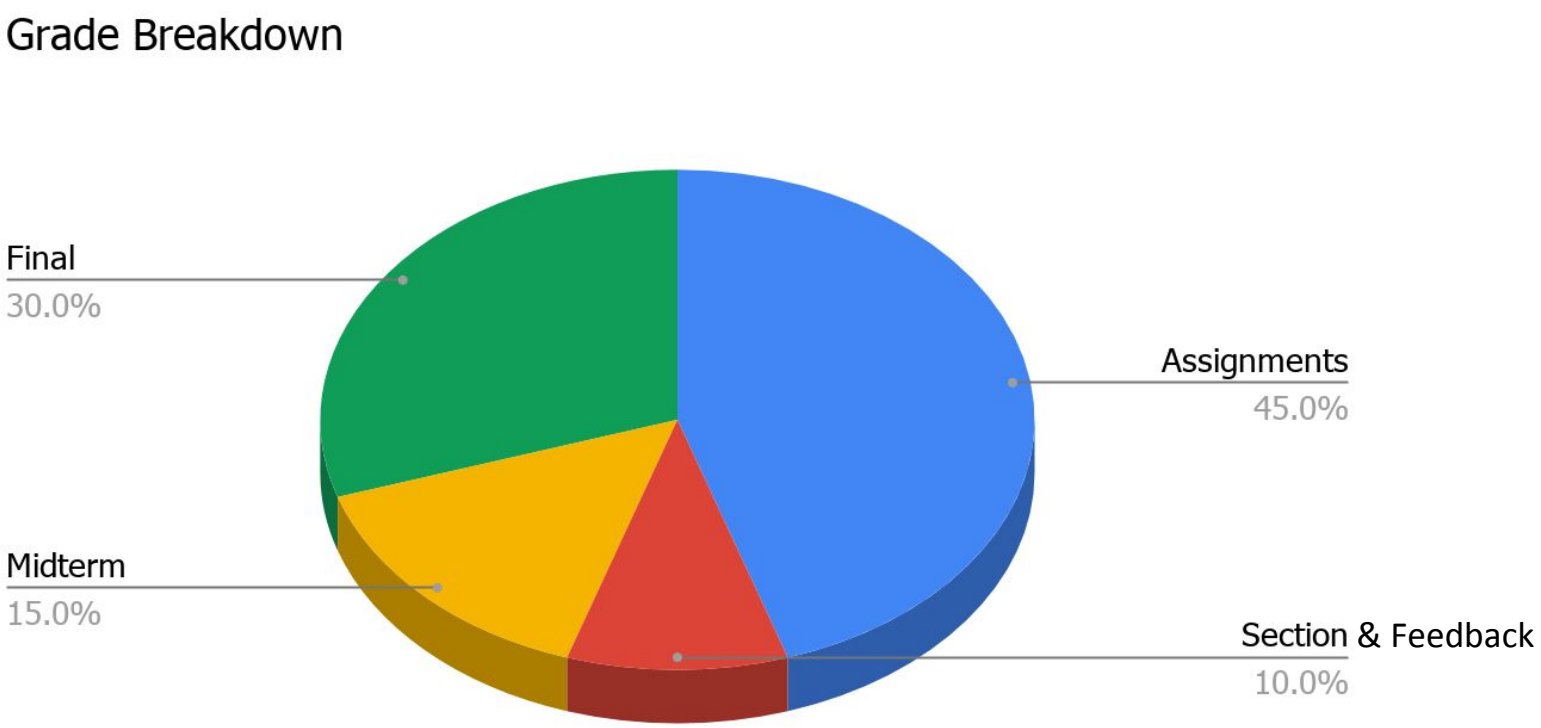



**Karel the Robot Learns Java**




Link to Interactive Course Reader

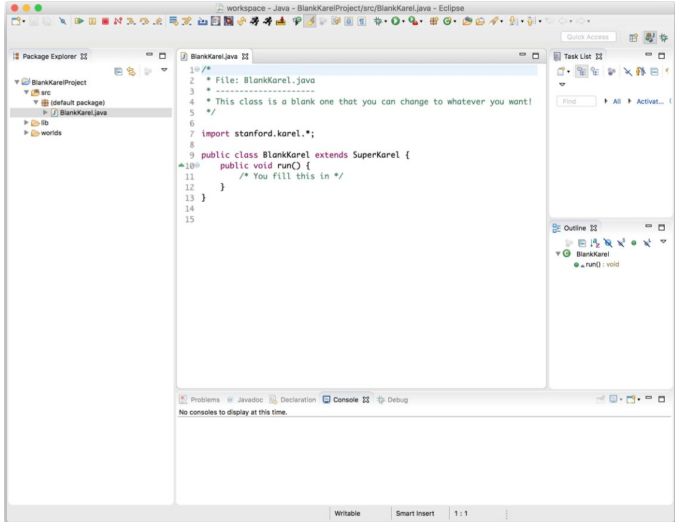
# Grading


Grade Breakdown
Final
30.0%
Assignments
45.0%
Midterm
15.0%
Section & Feedback
10.0%

# Programming Assignments

**6 assignments** (some individual, some in pairs) **completed using *Eclipse***

- Free software, on course website
- **Homework:** set up Eclipse!
- Come or LaIR or Office Hours for help




Graded on:

- **Functionality** (behavior)
- **Style** (elegance)

# The Bucket System

✓+ satisfies all requirements

✓ satisfies all requirements *with minor issues*

# The Bucket System

| | |
|---|---|
| ++ | submission so good, it “makes you weep” |
| + | exceeds expectations |
| ✓+ | satisfies all requirements |
| ✓ | satisfies all requirements *with minor issues* |
| ✓- | falls short of requirements *with moderate issues* |
| - | falls short of requirements *with severe issues* |
| -- | not completed or not functional |

# Late Days

- Assignments are due at **10:00am** (30 min before lecture)

- **You have 3 "Late Days" for the quarter.**
  - Each ***"Late Day"*** gives you a 24 hour extension *with no penalty*.
  - You may combine *up to two* late days for a 48 hour extension.
  - After all late days are used, you will lose one bucket in *functionality and style* per day your assignment is late.

# Section

- Weekly 50-minute sections led by your section leader.
- Go over lecture materials, do practice problems, answer questions.
- Graded on section attendance and participation.

- **Homework:** sign up for a section on the course website!

# Exams:

- *Midterm:* Monday, July 22nd, 7pm - 9pm
  - Email the instructors by ***July 8th*** if you have an academic or University conflict or OAE accommodations.

- *Final:* Saturday, August 17th, 8:30am - 11:30am
  - **No alternate final!** You MUST be able to take the final exam at the scheduled time (except for OAE accommodations).

# Lecture Feedback

- You'll be assigned to **give anonymous feedback on two lectures throughout the quarter.**
- Submit your comments by 10AM on the Monday following each lecture.
- See the "Lecture Assignments" document under the "Lecture" dropdown on the website for more details.

# Office Hours and Help

**LaIR Hours (aka Section Leader Office Hours):**

Sun - Wed, 7-11pm in Tressider Union (first floor, in the food court area)

**Sarai's and Laura's Office Hours:**

Mon and Wed, 1:30 to 3:30 in Gates B02

**Piazza:**

Forum for asking & answering questions; check website

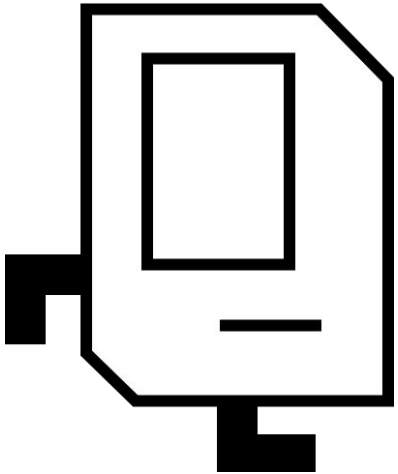
# 2 Minds are (sometimes) Better than 1

- Some assignments may optionally be done in pairs
- Both partners receive the same grade
- A chance to brainstorm ideas and work with another programmer
- **MUST be in the same section!**
  - **put the same section preferences to make this happen!**
- More info in handout #1 and on the course website

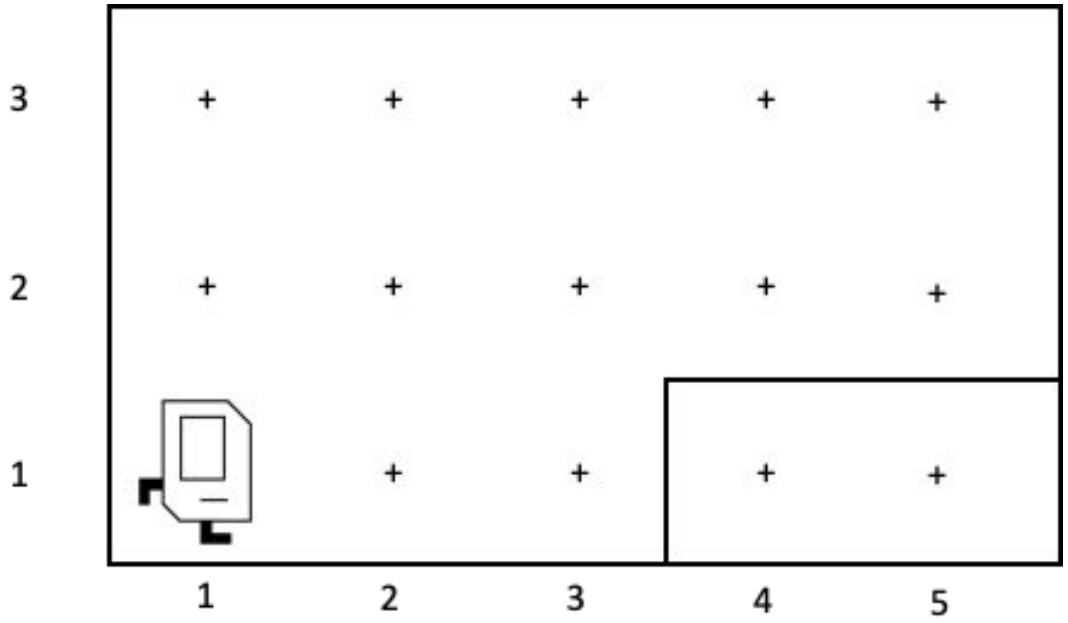
# Plan for Today

- Introductions
- Course Logistics
- Meet Karel the Robot

# Meet Karel the Robot!

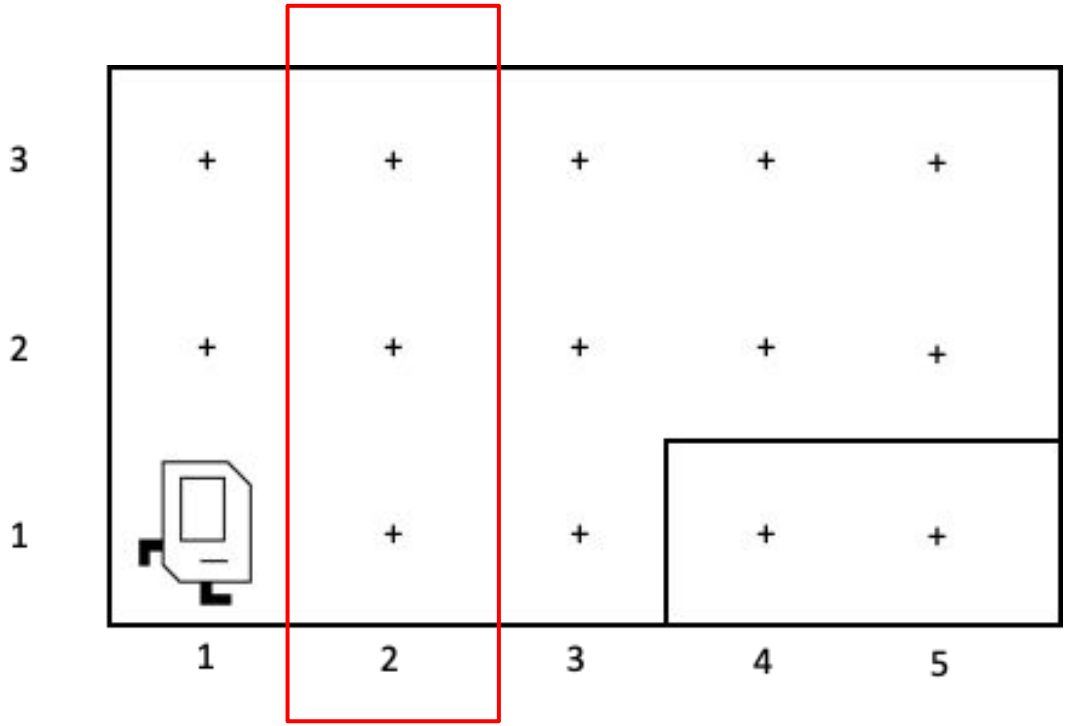


# Karel's World

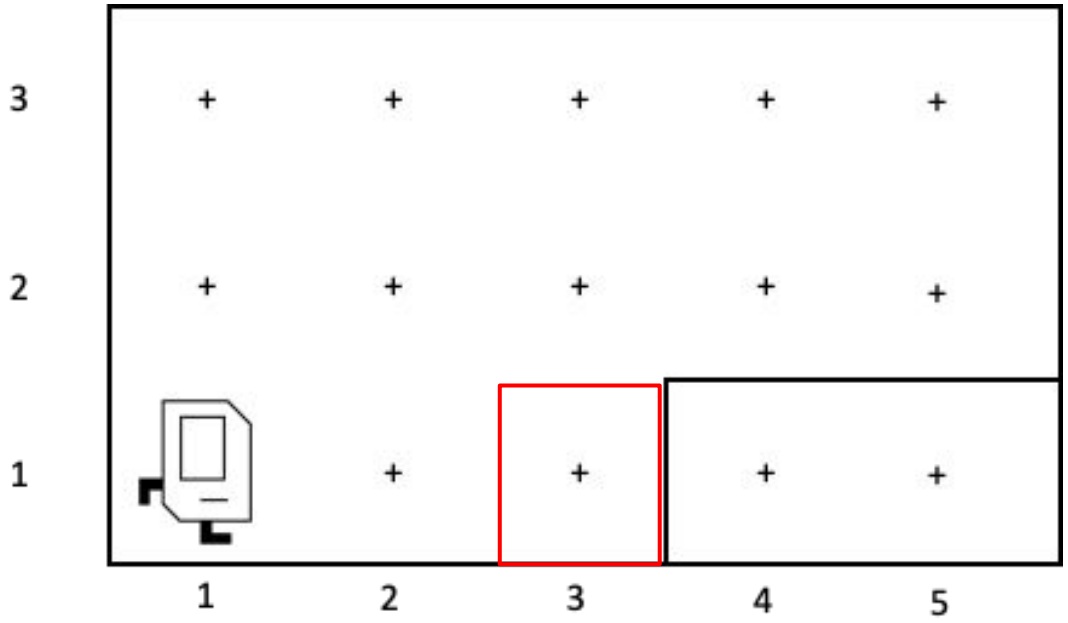


# Streets (rows)

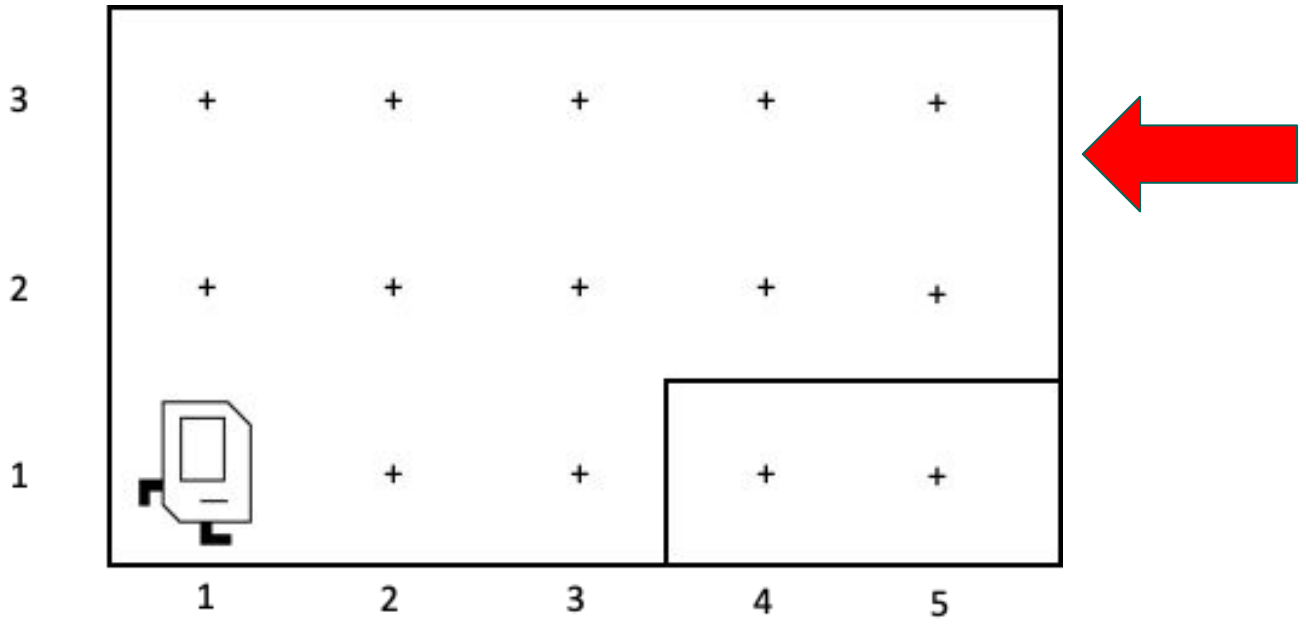
# Avenues (columns)



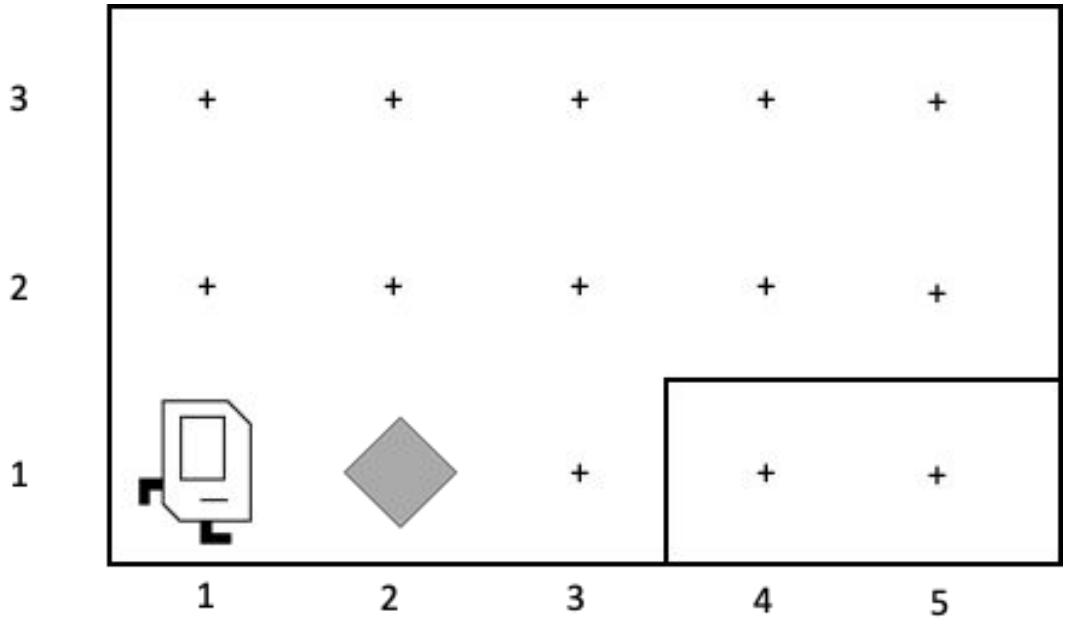
# Corners (locations)



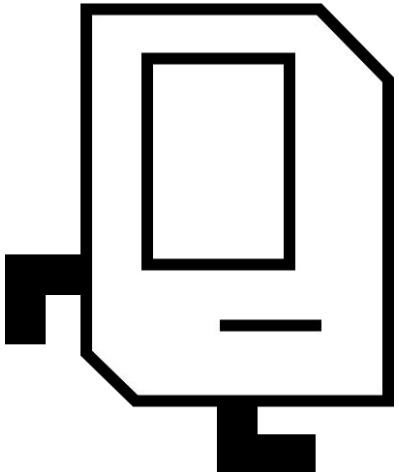
# Walls



# Beepers



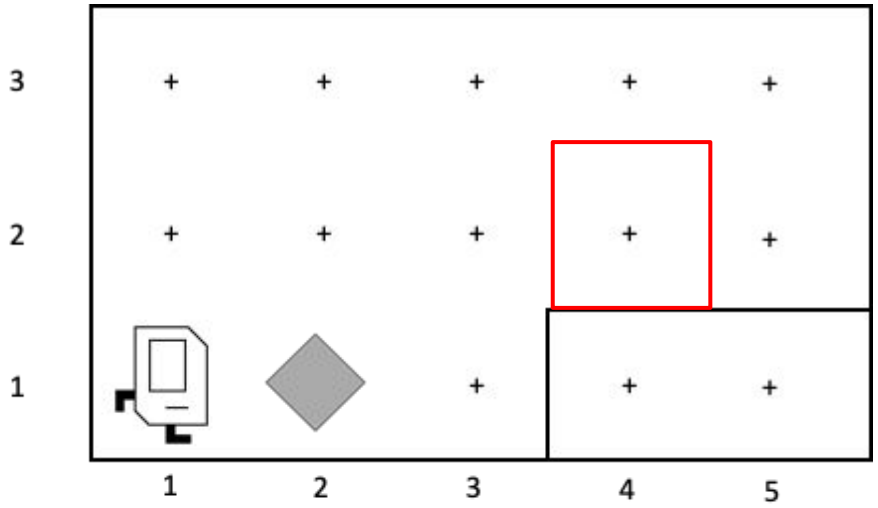
# What Can Karel Do?



**Karel Can:**

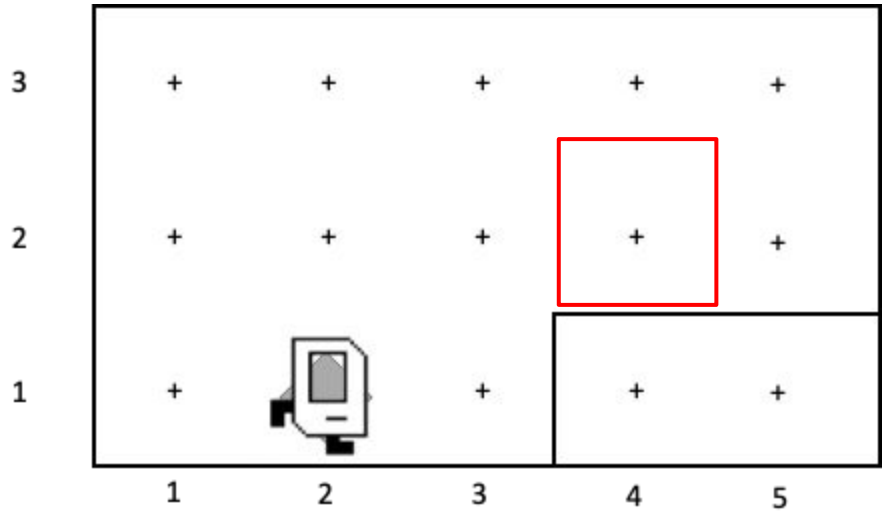
```
move();

turnLeft();

putBeeper();

pickBeeper();
```

# Clean Your Room!




**Karel needs to pick up the Beeper and put it back on the shelf!**

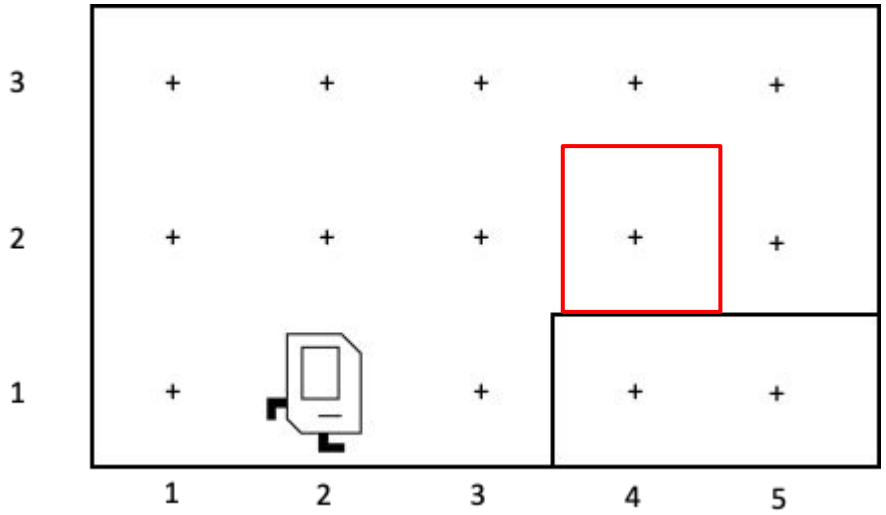
# Clean Your Room!




**Karel needs to pick up the Beeper and put it back on the shelf!**

```
move();
```

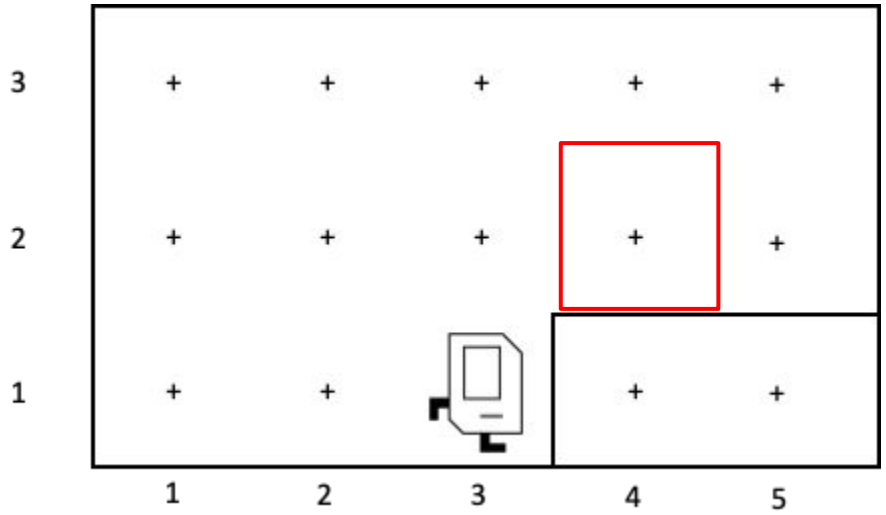
# Clean Your Room!




**Karel needs to pick up the Beeper and put it back on the shelf!**

```
move();

pickBeeper();
```

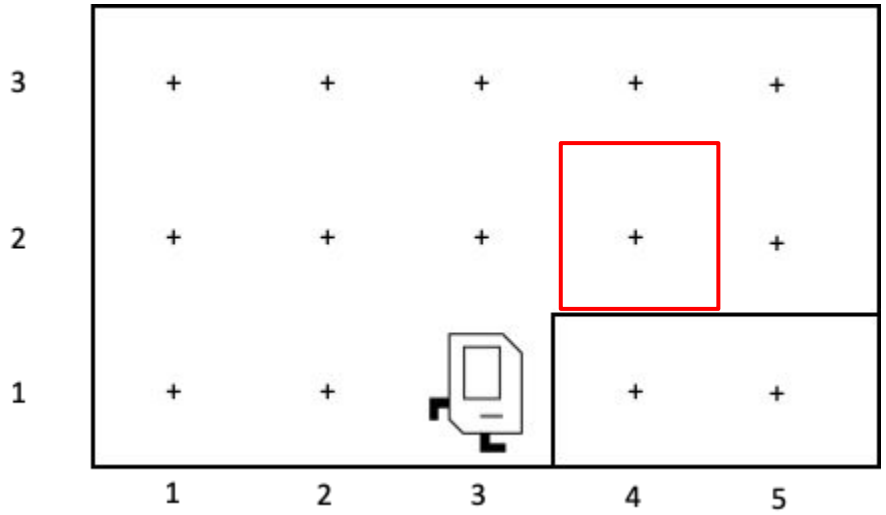
# Clean Your Room!




**Karel needs to pick up the Beeper and put it back on the shelf!**

```
move();

pickBeeper();

move();
```

# Clean Your Room!



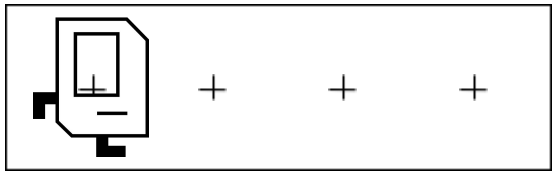

**Karel needs to pick up the Beeper and put it back on the shelf!**

```
move();

pickBeeper();

move();
```

**What next? Karel needs to `putBeeper();` on the shelf!**

# Let’s Code It!

# Methods



A **method** is a new set instructions we've created!

```
/* Comment describing method */
private void nameOfMethod(){

     // command 1
     // command 2

}
```

# Wrap-up

- Introductions
- Course Logistics
- Meet Karel the Robot

**Homework**:

- Set up Eclipse (instructions on course website)
- Sign up for section on course website
- **Assignment 0:** Tell us about yourself - https://bit.ly/2X0Pmzz

**Next time:** More adventures with Karel!