CS 106A, Lecture 1
Welcome to CS 106A!

suggested reading:

Course Information handout
Karel, Ch. 1-2
Plan For Today

• Introduction
• Course Policies
• Meet Karel the Robot
Plan For Today

• Introduction
• Course Policies
• Meet Karel the Robot
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, mathematics, philosophy, and more

• Touches many aspects of our daily lives
Computing is Everywhere

• > 3.5B users of the internet (internetlivestats.com)
• 39% owned a smartphone in 2016 (strategyanalytics.com)
• A computer recently defeated the world-champion Go player
• Machine translation has taken dramatic leaps in the past year
What is CS 106A?

• Programming *Methodology*
  – Focusing on computational problem solving, not syntax
  – Uses the **Java** programming language
  – No former programming experience required!

• Topics include:
  – Karel the Robot
  – Text-based programs
  – Graphics and animation
  – Games
  – And more…
cs106a.stanford.edu
Nice to meet you!

Instructor: Nick Troccoli

Head TA: Rishi Bedi
Section Leaders

• Helpful undergraduate assistants who will:
  – run your discussion section each week
  – grade your homework assignments and exams
  – help you when you have questions
  – ... and much more
Nice to meet you!

Aleksander Dash
Canyon Robins
Conner Smith
Emily Ling

Farah Uraizee
Garrick Fernandez
Gus Torres da Silva
Guy Blanc

Jared Bitz
Jestin Ma
Kate Rydberg
Katherine Erdman
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Matriculated Stanford grad?

- **No**: 5!
- **Yes**: 3-5!
Course Website

cs106a.stanford.edu
Textbooks

• *Karel the Robot Learns Java*, coursereader (35 pages)
  – used this and next week as we introduce coding
  – usable on open-book (closed-note) exams
  – Free PDF available online

• *The Art & Science of Java*, by Eric Roberts
  – written here at Stanford; tailored to this course; a valuable reference
  – usable on open-book (closed-note) exams
  – available on reserve at library
Grading

***** 45% Programming assignments
*
** 15% Midterm Exam
**** 30% Final Exam
Grading

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Programming Assignments

- 6 programming assignments (some individual, some in pairs), completed using Eclipse
- Free software, available on course website
- **Homework:** set up Eclipse!
- Come to LaIR this **Wed. 7-11PM** for troubleshooting

- graded on **functionality** (behavior) and **style** (elegance)
  - Interactive grading sessions for every assignment
  - grading scale is divided into "buckets"
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Getting Help

• Visit the SLs in the LaIR (1st floor of Tresidder Union)
  – open Sun-Wed, 7PM – 11PM, starting this Wednesday
  – staffed with multiple section leaders to answer questions

• other help resources:
  – instructor office hours
  – head TA office hours
  – email SL, TA, instructor

• Eclipse troubleshooting session **Wednesday 6/28 7-11PM @ LaIR**
2 Minds are 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!
• More info in handout #1 and on the course website
Interactive Grading

• For each assignment (except for the last), you will get feedback via an Interactive Grading (IG) session, scheduled with your section leader.

• Go over assignment feedback, strengths, things to improve
Late Days

• **Start out with 3 “free late days”**: each late day allows you to submit an assignment 24 hours late without penalty.

• Hard deadline 48 hours after original due date

• 1-bucket deduction per day late after late days are exhausted

• Pair late days are assessed individually

• ”Pre-granted extensions” – additional extensions granted only in very special circumstances. **Head TA** must approve extensions.
Grading

****** 45% Programming assignments
* 10% Section Participation
** 15% Midterm Exam
**** 30% Final Exam
Discussion Sections

- Weekly 50-minute sections led by your section leader
- Go over lecture material, do practice problems, answer questions
- Graded on section attendance + participation (+IG attendance)
- **Homework**: sign up for section on the course website!
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Exams

• **Midterm exam** – Monday, July 24\(^{\text{th}}\), 7-9PM
  – Contact me by *July 17* if you have an academic or University conflict

• **Final exam** – Friday, August 18\(^{\text{th}}\), 12:15-3:15PM
  – No alternate final! You **MUST** be able to take the final exam at the scheduled time.

• Both exams are *open-book, closed-notes, closed-electronic-device*. You will be provided with a syntax reference sheet.
Grading

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Stanford Honor Code

- The **Honor Code** is an undertaking of the students, individually and collectively:
  - that they will not give or receive aid in examinations; that they will not give or receive unpermitted aid in class work, in the preparation of reports, or in any other work that is to be used by the instructor as the basis of grading;
  - that they will do their share and take an active part in seeing to it that others as well as themselves uphold the spirit and letter of the Honor Code.

- The faculty on its part manifests its confidence in the honor of its students by refraining from proctoring examinations and from taking unusual and unreasonable precautions to prevent the forms of dishonesty mentioned above. The faculty will also avoid, as far as practicable, academic procedures that create temptations to violate the Honor Code.

- While the faculty alone has the right and obligation to set academic requirements, the students and faculty will work together to establish optimal conditions for honorable academic work.

see also:  [http://honorcode.stanford.edu/](http://honorcode.stanford.edu/)
Honor Code and CS 106A

• Please help us ensure academic integrity:
  – Indicate any assistance received on HW (books, web sites, friends).
  – Do not look at other people's solution code (outside of your pair).
  – Do not give your solution code to others, or post it on the web.
  – Report any inappropriate activity you see performed by others.

• Assignments are checked regularly for similarity with help of software tools.

• If you realize that you have made a mistake, you may retract your submission to any assignment at any time, no questions asked.

• If you need help, please contact us and we will help you.
  – We do not want you to feel any pressure to violate the Honor Code in order to succeed in this course.
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Meet Karel the Robot!
Meet Karel the Robot!

Hello, world!
Programming languages

- **procedural languages**: programs are a series of commands
  - **Pascal** (1970): designed for education
  - **C** (1972): low-level operating systems and devices

- **functional programming**: functions map inputs to outputs
  - **Lisp** (1958) / **Scheme** (1975), **ML** (1973), **Haskell** (1990)

- **object-oriented languages**: programs use interacting "objects"
  - **Smalltalk** (1980): first major object-oriented language
    - successful in industry; used to build OSes such as Windows
  - **C++** (1985): "object-oriented" improvements to C
    - Runs on many platforms (Windows, Mac, Linux, cell phones...)
  - **Java** (1995): designed for embedded systems, web apps
    - Runs on many platforms (Windows, Mac, Linux, cell phones...)
    - The language taught in this course and our textbook
Karel's World

The diagram represents a world where Karel is positioned at the start point. The world is a 5x3 grid with walls and a diamond indicating the goal position.
Hello, world!
Karel's World
Each row is called a street.
Avenues (columns)

Each column is called an avenue.
Corners (locations)

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

Karel cannot move through walls.
Beepers mark locations in Karel's world. Karel can pick them up and put them down.
Wrap-up

• Introduction  ✓
• Course Policies  ✓
• Meet Karel the Robot  ✓

Next time: more programming with Karel!