Welcome to CS 61A

About the Course

The 61A Community

- 39 teaching assistants (TAs), known at Berkeley as GSIs or UGSIs:
  - Teach lab & discussion sections
  - Hold drop-in office hours
  - Lots of other stuff: develop assignments, grade exams, etc.

- Tutors:
  - Hold drop-in office hours
  - Teach 5-person mentoring sections
  - Lots of other stuff: homework parties, mastery sections, etc.

- Academic interns help answer individual questions during lab

1,450 fellow students make CS 61A unique

Parts of the Course

- Lecture: Videos posted to cs61a.org before each live lecture
- Lab section: The most important part of this course (next week)
- Discussion section: The most important part of this course (this week)
- Staff office hours: The most important part of this course (next week)
- Online textbook: http://composingprograms.com (read it before class)

Weekly homework assignments, three exams, & four programming projects
Lots of optional special events to help you complete all this work

Everything is posted to cs61a.org

An Introduction to Computer Science

What is Computer Science?

- The study of what problems can be solved using computation,
  how to solve those problems, and what techniques lead to effective solutions

- Systems
  - Artificial Intelligence
  - Graphics
  - Security
  - Networking
  - Programming Languages
  - Theory
  - Scientific Computing

- Decision Making
  - Robotics
  - Natural Language Processing

- Answering Questions
  - Translation

What is This Course About?

- A course about managing complexity
- Mastering abstraction
- Programming paradigms
- An introduction to programming
- Full understanding of Python fundamentals
- Combining multiple ideas in large projects
- How computers interpret programming languages
- Different types of languages: Scheme & SQL

- A challenging course that will demand a lot of you
Alternatives to CS 61A

CS 10: The Beauty and Joy of Computing
Designed for students without prior experience
A programming environment created by Berkeley, now used in courses around the world and online
An introduction to fundamentals (in Python) that sets students up for success in CS 61A
Spring 2020: Dan Garcia
15 open seats (as of Wed 1/22)
Monday & Wednesday 3-4 in 120 Latimer
More info: http://cs10.org/

CS 88: Computational Structures in Data Science
Alternative to CS 61A with very similar content
• Data 8 overlaps with ~25% of CS 61A
• CS 88 overlaps with 50% of CS 61A or more
Both together cover >75% of CS 61A, enough to skip CS 61A and go directly to CS 61B
Some students take CS 61A after CS 88 for a very thorough introduction to programming
Spring 2020: 3 units and a revised syllabus
80 open seats (as of Wed 1/22)
Monday & Friday 1-2 in 10 Evans
More info: https://cs88-website.github.io/

Course Policies

Learning
Community
Course Staff

Expressions

Types of expressions
An expression describes a computation and evaluates to a value

\[ \frac{6}{23}, \sin \pi, \log_2 1024, \lim_{x \to 1} \frac{1}{x^2} \]

\[ \sum_{i=1}^{100} f(x) = \frac{69}{18}, \sqrt{1493161} \]

\[ 7 \mod 2 = 1, 18 \mod 2 = 0 \]

\[ |-1869| = 1869 \]
Call Expressions in Python

All expressions can use function call notation

Anatomy of a Call Expression

Operators and operands are also expressions

Evaluation procedure for call expressions:
1. Evaluate the operator and then the operand subexpressions
2. Apply the function that is the value of the operator to the arguments that are the values of the operands

Evaluating Nested Expressions

Expressions, Values, Objects, Interpreters, and Data