61A Lecture 1

Wednesday, January 21, 2015
Welcome to Berkeley Computer Science!

Spring 2015 office hours:

781 Soda
Wednesday 10am–12pm &
Friday by appointment:
http://denero.org/meet
The Course Staff

**Teaching Assistants** (GSIs/UGSIs) run discussion sections, labs, and office hours

27 **Group Tutors** are your personal programming mentors

Over 300 **Lab Assistants** ensure that you don’t get stuck for too long
Parts of the Course

**Lecture:** Videos posted to [http://cs61a.org](http://cs61a.org) before each live lecture

**Lab:** The most important events in this course

**Discussion:** Also the most important events in this course

**Office Hours:** Also the most important events in this course [11–5 M–Th & 11–1 Friday]

**Online textbook:** [http://composingprograms.com](http://composingprograms.com)

Weekly homework assignments, three exams, three quizzes, & four programming projects

Lots of special events
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

...
What is This Course About?

• A course about managing complexity
  § Mastering abstraction
  § Programming paradigms
  § Not just about 0's and 1's

• An introduction to Python
  § Full understanding of language fundamentals
  § Learning through implementation
  § How computers interpret programming languages

• A challenging course that will demand a lot of you
Course Policies
Alternatives to This Course

CS 61AS: Self-Paced CS 61A

CS 10: The Beauty and Joy of Computing
Course Policies

Learning

Community

Course Staff

Details...

http://cs61a.org/about.html
Collaboration

**Asking questions is highly encouraged**
- Discuss everything with each other; learn from your fellow students!
- Homework can be completed with a partner
- Projects should be completed with a partner
- Choose a partner from your discussion section

**The limits of collaboration**
- One simple rule: Don’t share your code, except with your partner
- Copying project solutions causes people to fail this course
- We really do catch people who violate the rules, because...
  - We also know how to search the web for solutions
  - We use computers to check your work

**Build good habits now**
Expressions
Types of expressions

An expression describes a computation and evaluates to a value

\[18 + 69\]
\[\frac{6}{23}\]
\[\sin \pi\]
\[\log_2 1024\]
\[2^{100}\]
\[f(x)\]
\[7 \mod 2\]
\[| - 1869|\]
\[\sqrt{3493161}\]
\[\sum_{i=1}^{100} i\]
\[\lim_{x \to \infty} \frac{1}{x}\]
\[\binom{69}{18}\]
Call Expressions in Python

All expressions can use function call notation

(Demo)
Anatomy of a Call Expression

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 subexpression to the arguments that are the values of the operand subexpression
Evaluating Nested Expressions

\[ \text{mul}(\text{add}(2, \text{mul}(4, 6)), \text{add}(3, 5)) \]
Evaluating Nested Expressions

expression: $\text{mul}(\text{add}(2, \text{mul}(4, 6)), \text{add}(3, 5))$

Value of the whole expression: 208

Value of subexpression: 26, 8

1st argument to mul: 26

Operand subexpression: $\text{mul}(\text{add}(2, \text{mul}(4, 6)), \text{add}(3, 5))$

Expression tree
Functions, Objects, and Interpreters

(Demo)