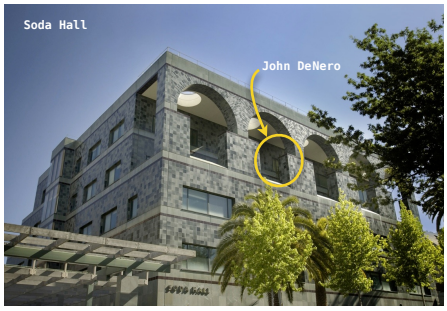
61A Lecture 1

Wednesday, January 21, 2015

Welcome to Berkeley Computer Science!

BERKELEY EECS



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 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

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
  - Decision Making
  - Robotics
  - Natural Language Processing
    - Translation
    - Answering Questions
    - ...
  - ...
- 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

python

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

$18 + 69$ $\quad \frac{6}{23}$ $\quad \sin \pi$ $\quad \log_2 1024$

2^{100} $\quad f(x)$ $\quad \sqrt{3493161}$

$7 \bmod 2$ $\quad \sum_{i=1}^{100} i$ $\quad \lim_{x \to \infty} \frac{1}{x}$

$|-1869|$ $\quad \binom{69}{18}$

Call Expressions in Python

All expressions can use function call notation

(Demo)

Anatomy of a Call Expression

add	(	2	,	3	)
Operator		*Operand*		*Operand*	

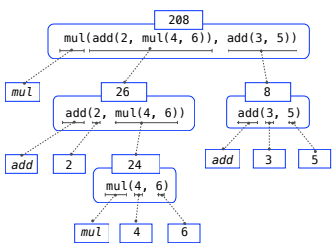
Operators and operands are also expressions

So they evaluate to values

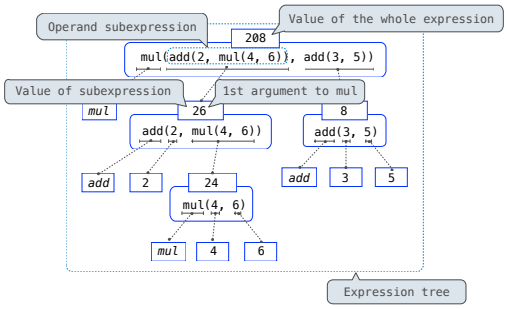
Evaluation procedure for call expressions:

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



Evaluating Nested Expressions



Functions, Objects, and Interpreters

(Demo)