

61A Lecture 1

Wednesday, August 24, 2016

Welcome to CS 61A!

I'm John DeNero

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Monday & Wednesday 11am - 12pm
By appointment: denero.org/meet



The 61A Community

45 undergraduate student instructors / teaching assistants (TAs):

- Teach lab & discussion sections
- Hold office hours
- Lots of other stuff: develop assignments, grade exams, etc.

45+ tutors & mentors:

- Teach mentoring sections
- Hold office hours
- Lots of other stuff: homework parties, mastery sections, etc.

200+ lab assistants help answer your individual questions

1,500+ 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>

Weekly homework assignments, three exams, & four programming projects

Lots of optional special events to help you complete all this work

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

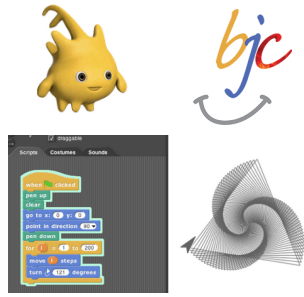
CS 10: The Beauty and Joy of Computing

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 (& Python) that sets students up for success in CS 61A

Taught in Fall 2016 by Dan Garcia

More info: cs10.org



Data Science 8: Foundations of Data Science

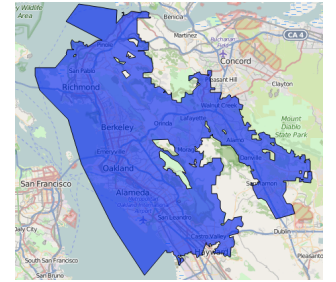
Fundamentals of computing, statistical inference, & machine learning applied to real-world data sets

Great programming practice for CS 61A

Cross-listed as CS C8, Stat C8, & Info C8

Taught in Fall 2016 by Ani Adhikari

More info: data8.org & databears.berkeley.edu



Course Policies

Course Policies

Learning
Community
Course Staff

Details...
<http://cs61a.org/articles/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
- 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

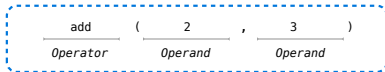
An expression describes a computation and evaluates to a value

$$\begin{array}{ccccccc} 18 + 69 & & \frac{6}{23} & \sin \pi & \log_2 1024 & & \\ 2^{100} & & & & & & \\ 7 \bmod 2 & \boxed{f(x)} & \sum_{i=1}^{100} i & \sqrt{3493161} & \lim_{x \rightarrow \infty} \frac{1}{x} & & \\ | - 1869 | & & & \binom{69}{18} & & & \end{array}$$

Call Expressions in Python

All expressions can use function call notation
(Demo)

Anatomy of a Call Expression

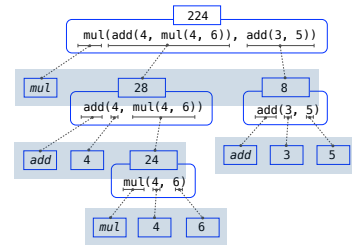


Operators and operands are also expressions
 So they evaluate to values

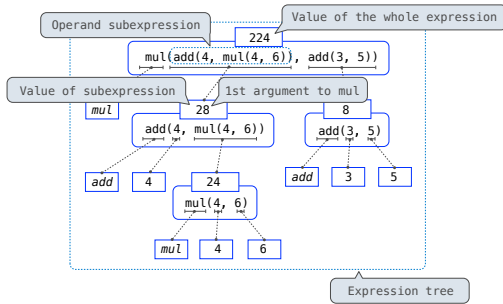
Evaluation procedure for call expressions:

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)