Welcome to Berkeley Computer Science!

The Course Staff

The Course Staff

• **TAs** hold discussion sections, labs, and [office hours](#)
• **Readers** are your personal programming mentors
• **Lab Assistants** ensure that you don’t get stuck for too long

An Introduction to Computer Science

What is Computer Science?

- What problems can be solved using computation, how to solve those problems, and what design choices lead to effective solutions.

- Systems
- Artificial Intelligence
- Graphics
- Security
- Networking
- Programming Languages
- Theory
- Scientific Computing
- Games
- Robotics
- Natural Language Processing
- ... 

What is This Course About?

- A course about managing complexity
- Mastering abstraction
- Programming paradigms
- Not about 1's and 0's
- An introduction to Python
- All the features we really need: introduced today
- Understanding through implementation
- How computers interpret programming languages
- A challenging course that will demand a lot of you
What is This Course About?

Course Logistics and Policies

Alternatives to This Course

Course Policies

Collaboration

Expressions
Types of expressions

An expression describes a computation and evaluates to a value.

\[ 18 + 69 = 86 \]
\[ \frac{6}{23} \]
\[ \sin \pi = 0 \]
\[ f(x) = \sqrt{3493161} \]
\[ \sum_{i=1}^{100} i \]
\[ \left| -1869 \right| \]

Call Expressions in Python

All expressions can use function call notation

(Demo)

Anatomy of a Call Expression

\[
\begin{align*}
\text{Operator} & : \text{add} \\
\text{Operand 0} & : ( \quad 2 \quad , \quad 3 \quad ) \\
\text{Operand 1} & : 
\end{align*}
\]

Operators and operands are expressions. So they evaluate to values.

Evaluation procedure for call expressions:

1. Evaluate the operator and 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

Data, Functions, and Interpreters

Data: The things that programs fiddle with

"The Art of Computer Programming"
Donald Knuth
Shakespeare’s 37 plays
(Ka-Nooth)

Functions: Rules for manipulating data

Count the words in a line of text
Add up numbers
Pronounce someone’s name

Interpreter: An implementation of the procedure for evaluation