

Functions

Welcome to CS 61A!

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John DeNero

denero@berkeley.edu

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Office hours in 781 Soda
(starting next week)

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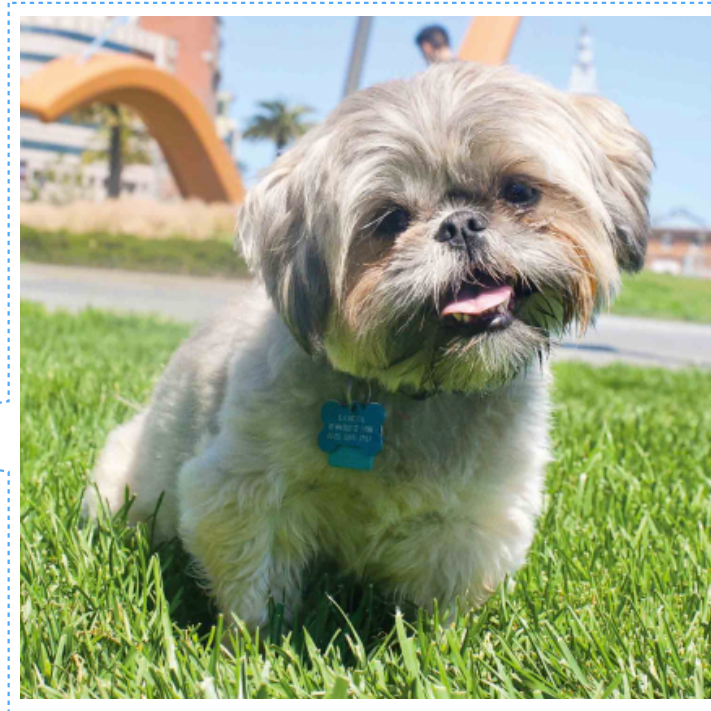
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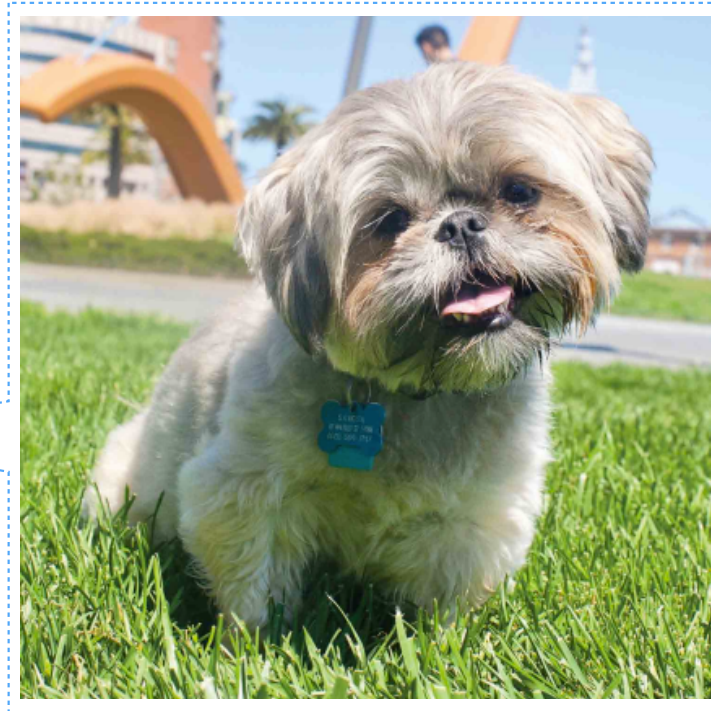
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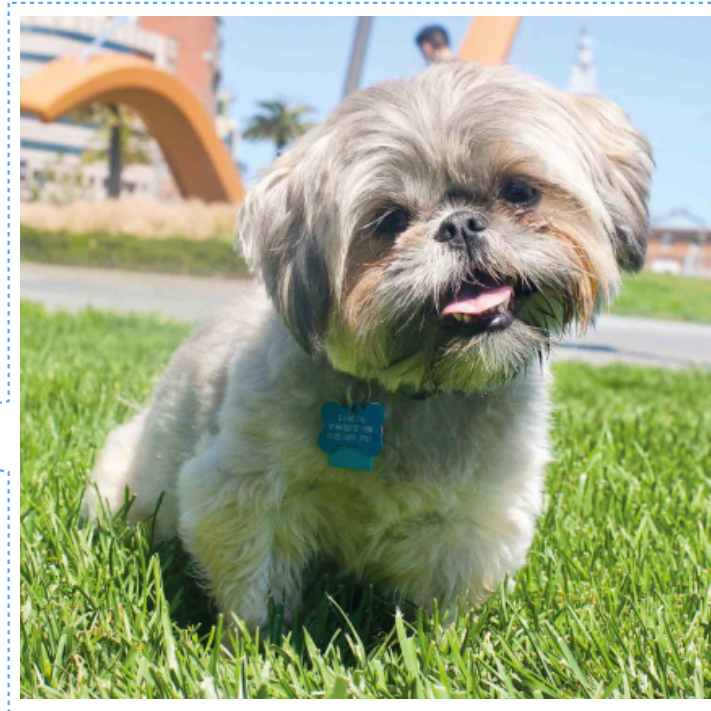
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Fastest way to get answers: piazza.com/berkeley/spring2018/cs61a

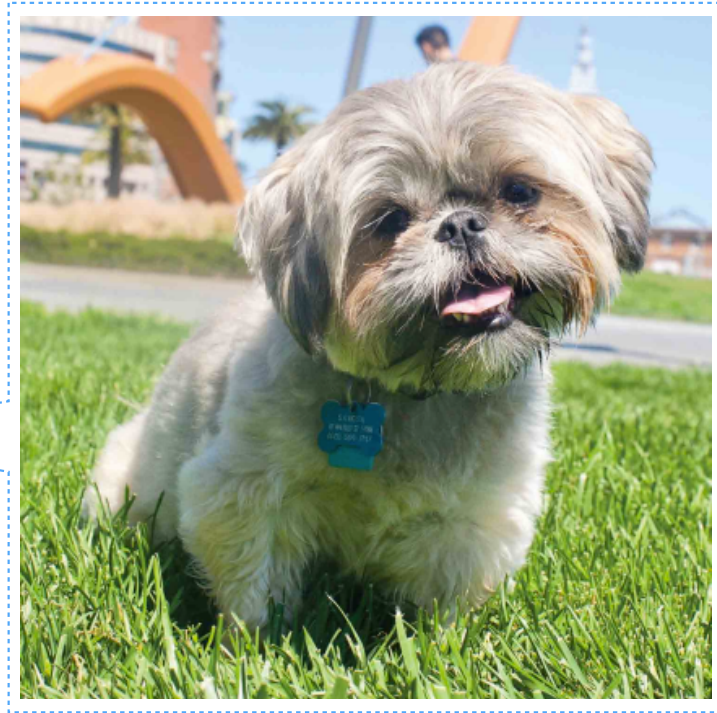
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Contact me & heads of staff: cs61a@berkeley.edu

The 61A Community

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44 teaching assistants (TAs), formally known at Berkeley as UGSIs:

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- Teach lab & discussion sections

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1,300+ fellow students make CS 61A unique

Parts of the Course

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Lecture: Videos posted to `cs61a.org` before each live lecture

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Lab section: The most important part of this course (*next week*)

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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?

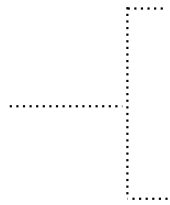
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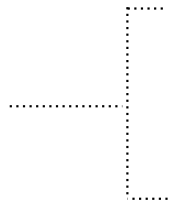
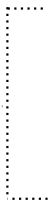
What problems can be solved using computation,
How to solve those problems, and

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- What problems can be solved using computation,
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- What techniques lead to effective solutions

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Systems

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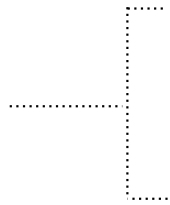
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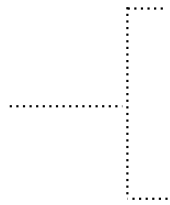
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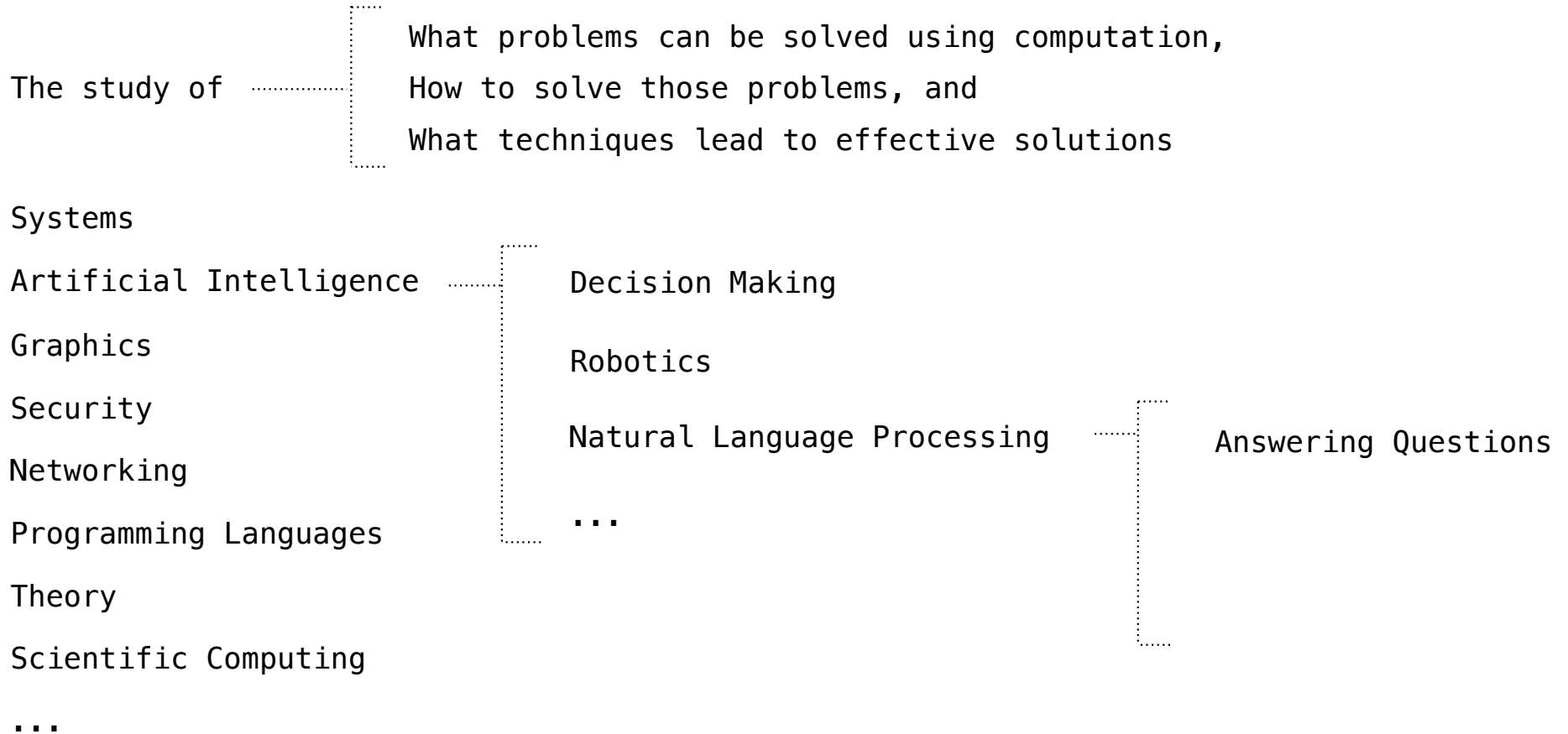
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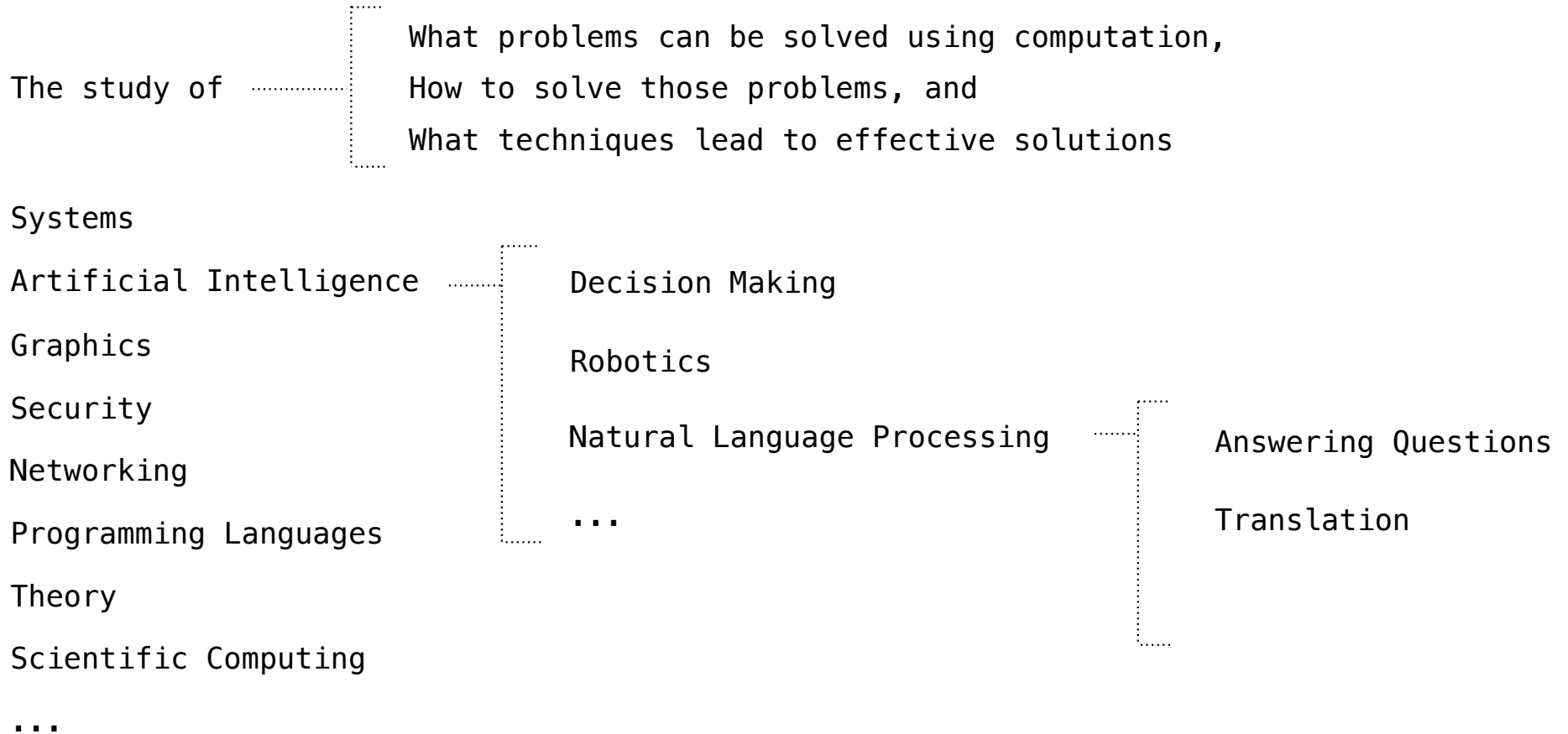
Natural Language Processing

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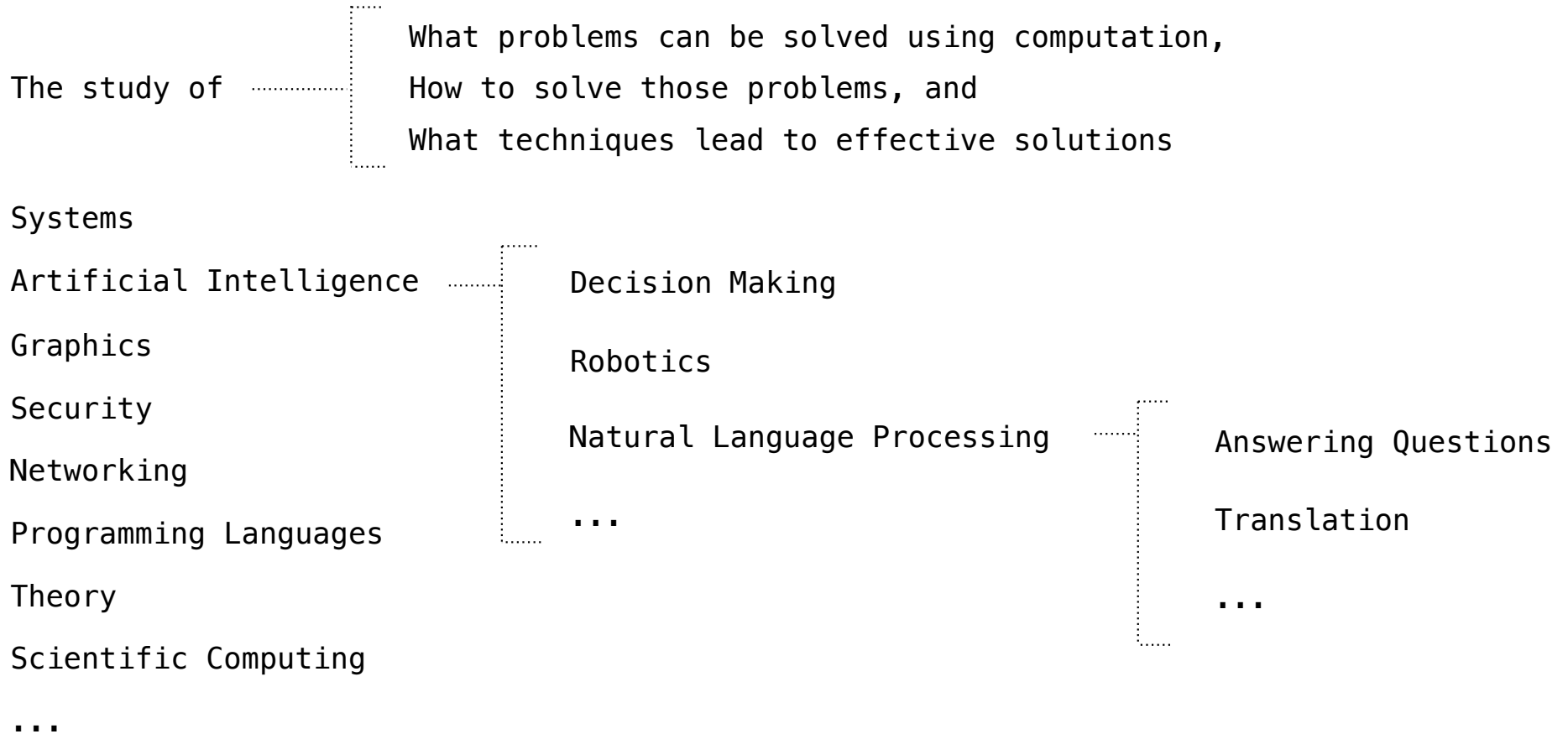
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What is This Course About?

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A course about managing complexity

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Mastering abstraction

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Different types of languages: Scheme & SQL



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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

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Designed for students without prior experience



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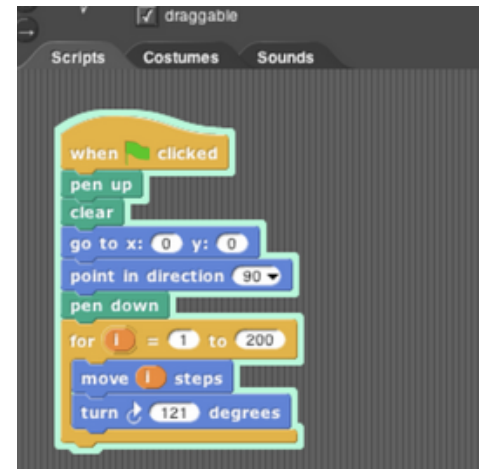
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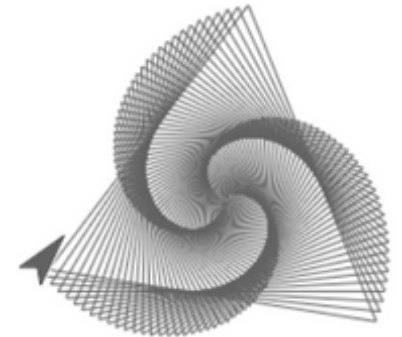
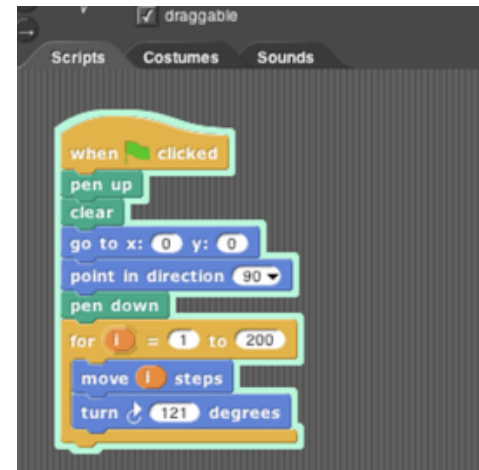
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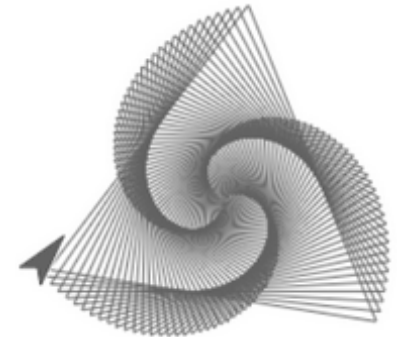
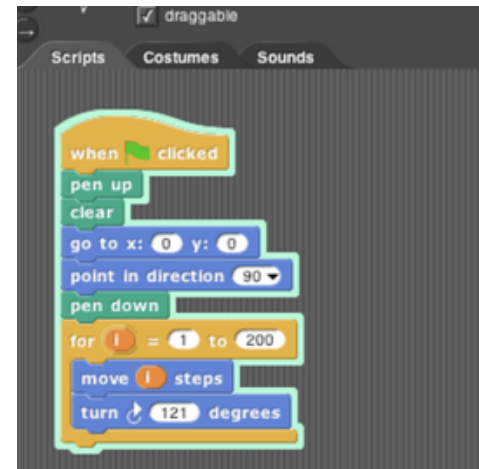


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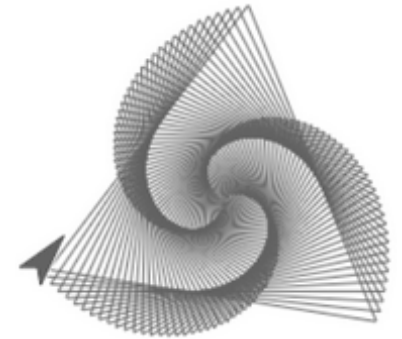
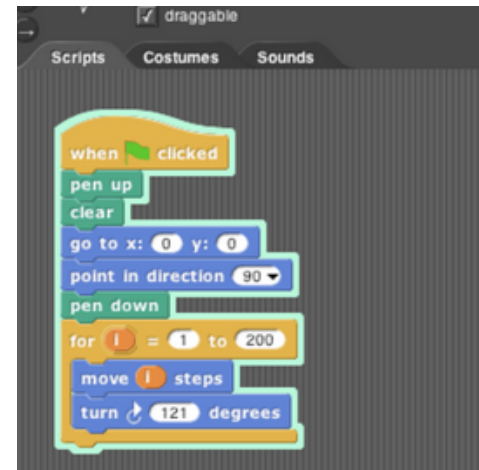
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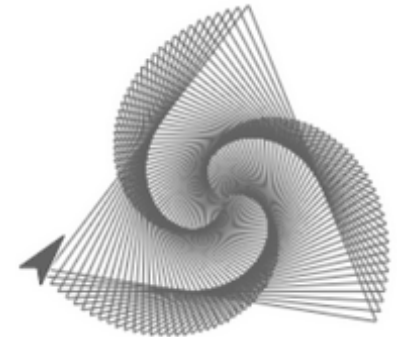
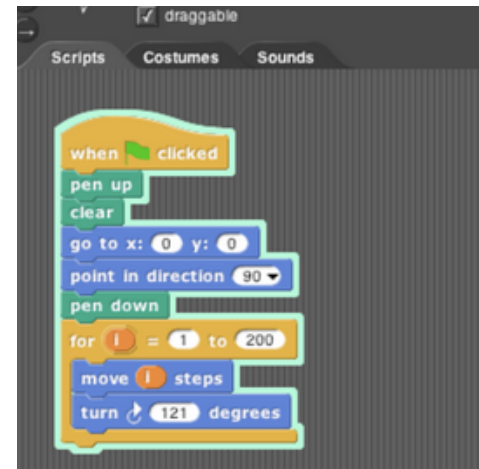
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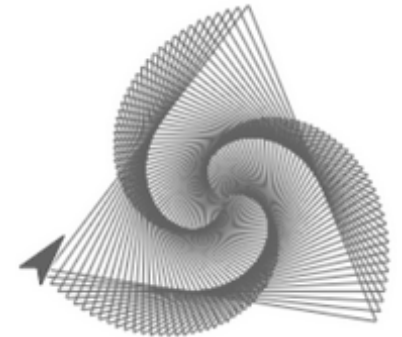
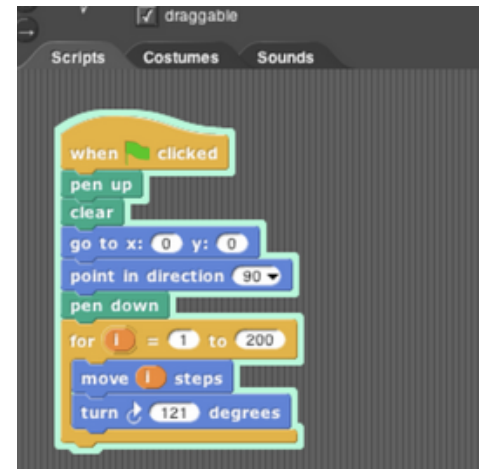
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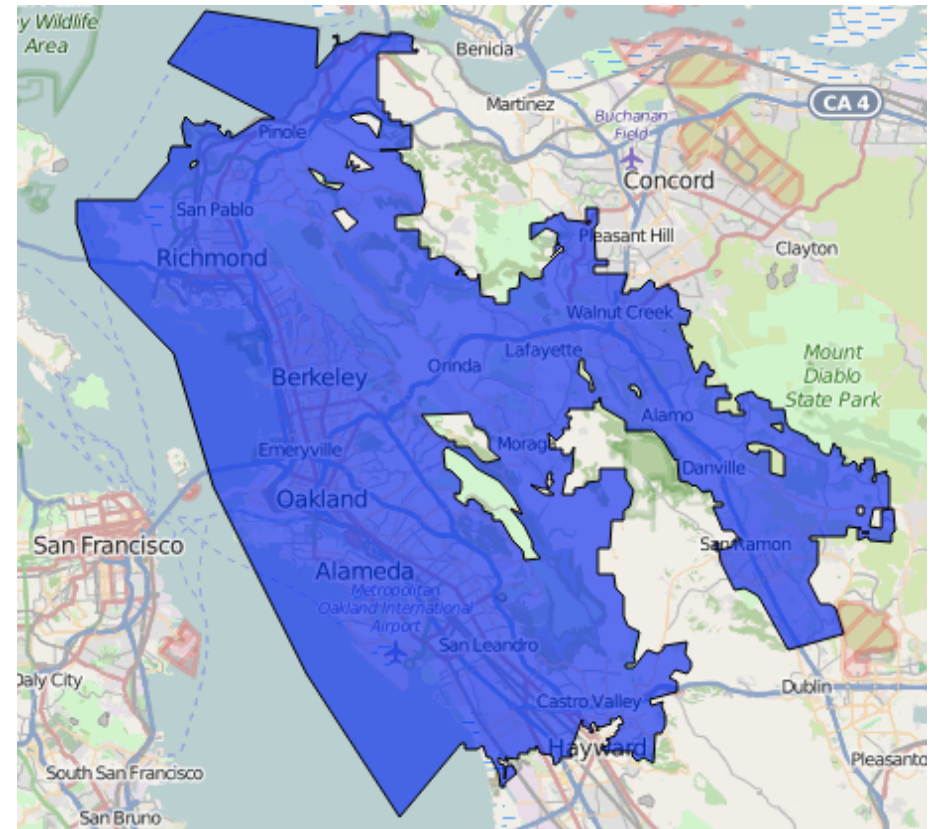
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Fundamentals of computing, statistical inference, & machine learning applied to real-world data sets

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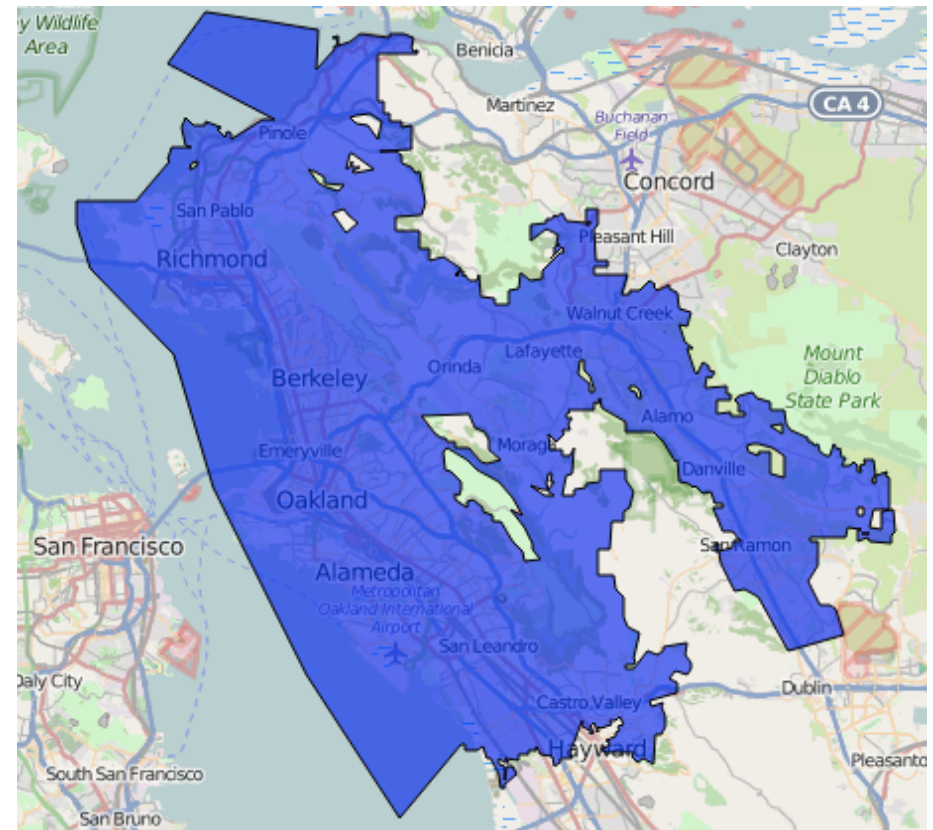
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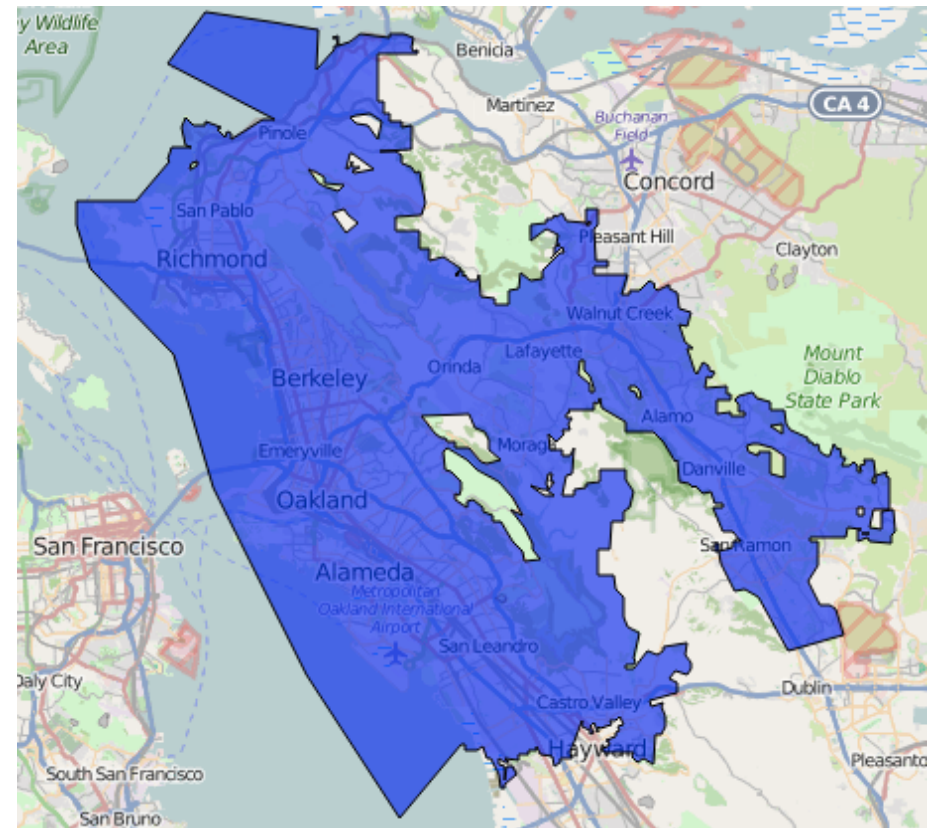


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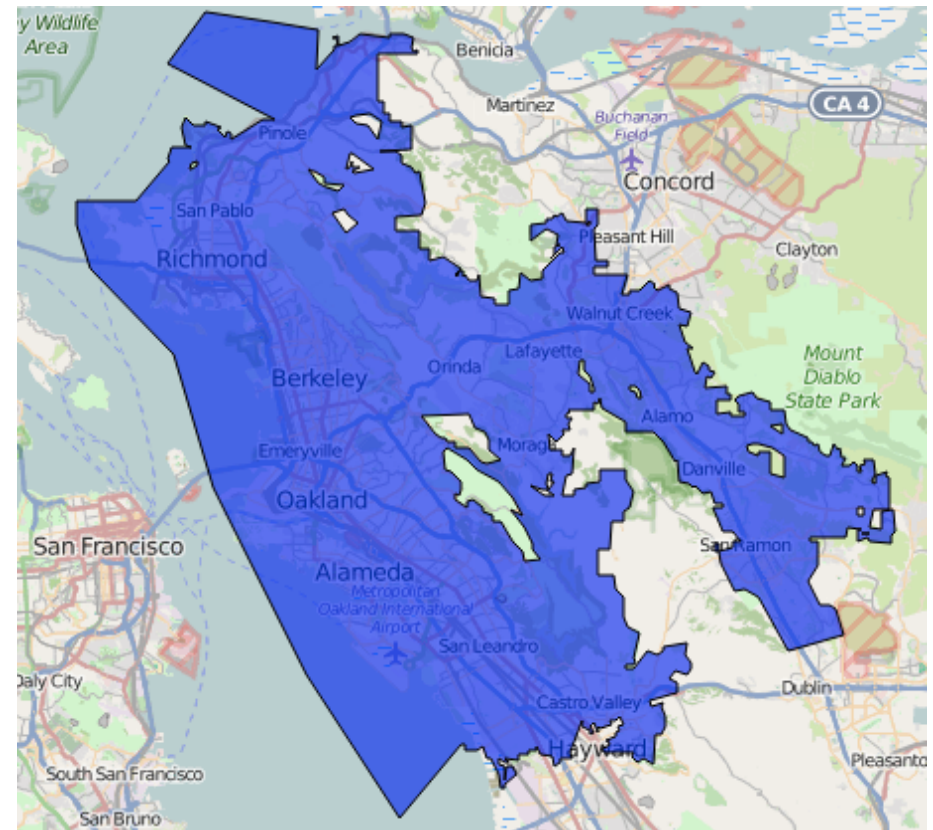
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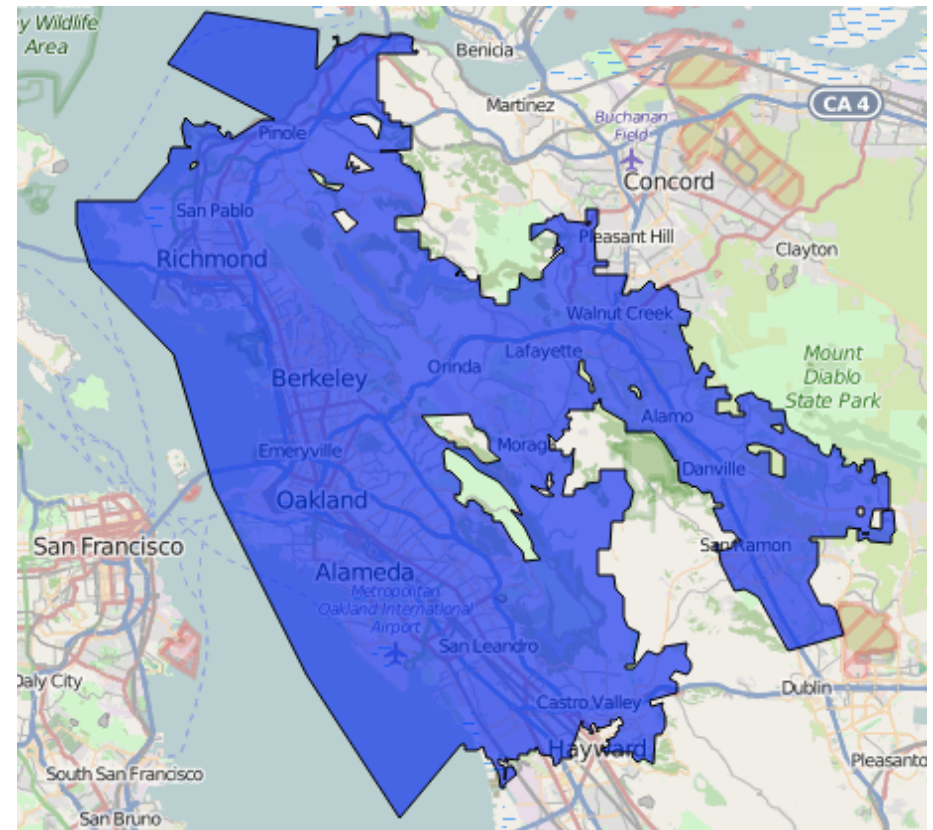
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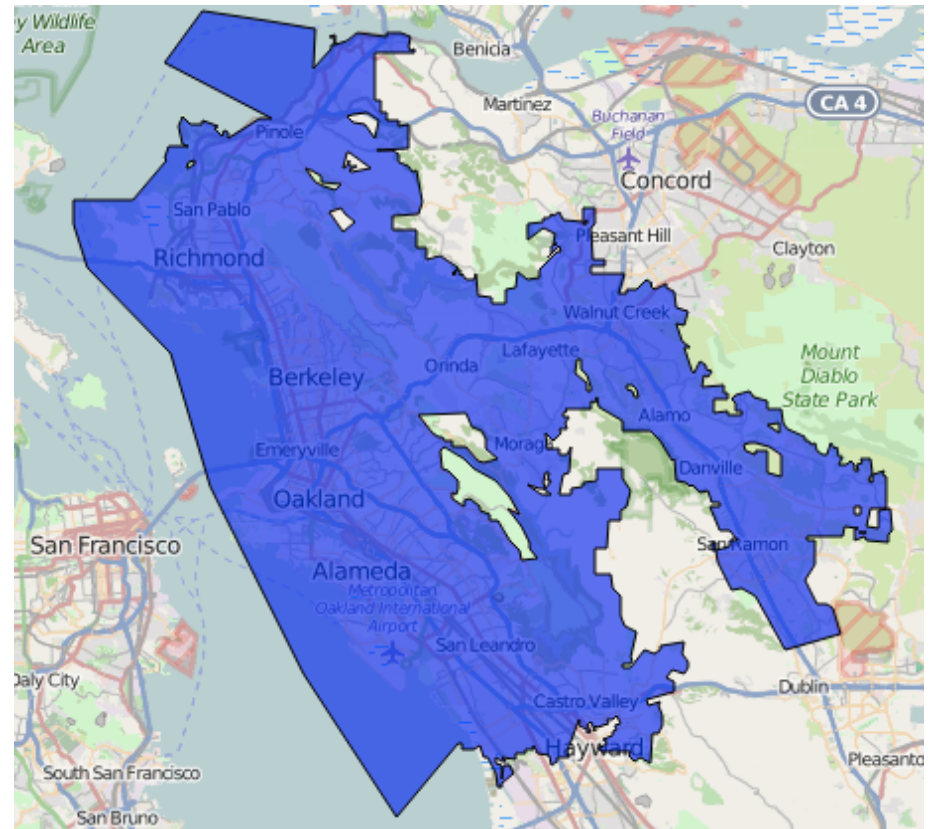
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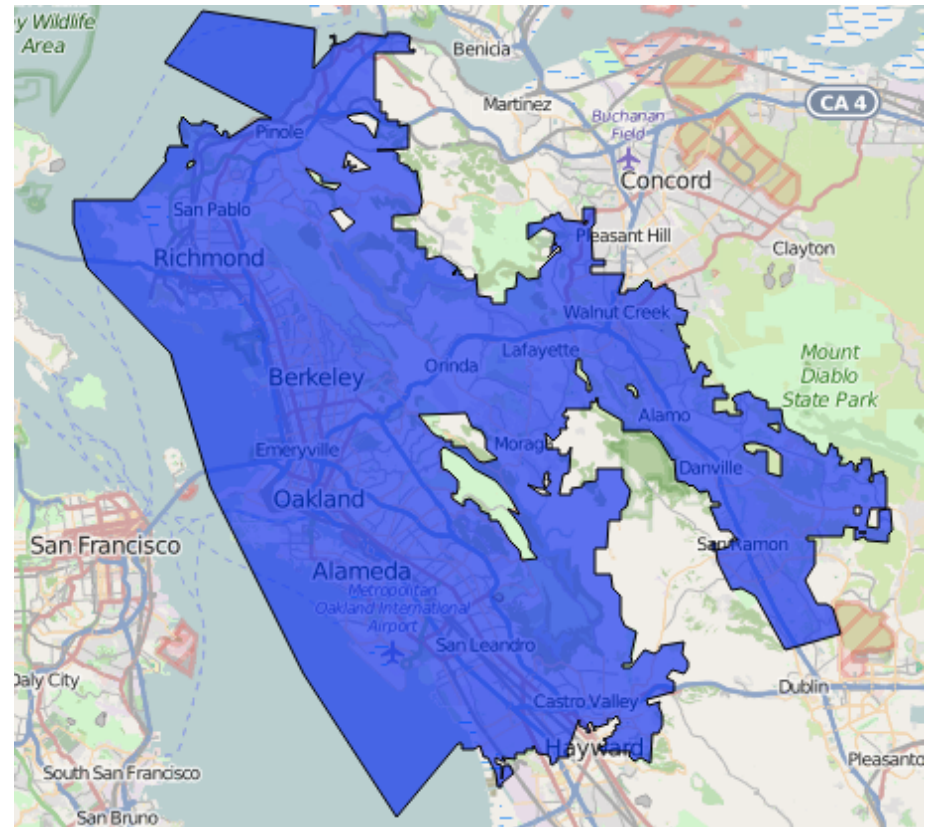
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Course Policies

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Learning

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Course Staff

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Details...

<http://cs61a.org/articles/about.html>

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The limits of collaboration

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Build good habits now

Expressions

Types of expressions

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An expression describes a computation and evaluates to a value

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$$18 + 69$$

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Types of expressions

An expression describes a computation and evaluates to a value

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Call Expressions in Python

All expressions can use function call notation
(Demo)

Anatomy of a Call Expression

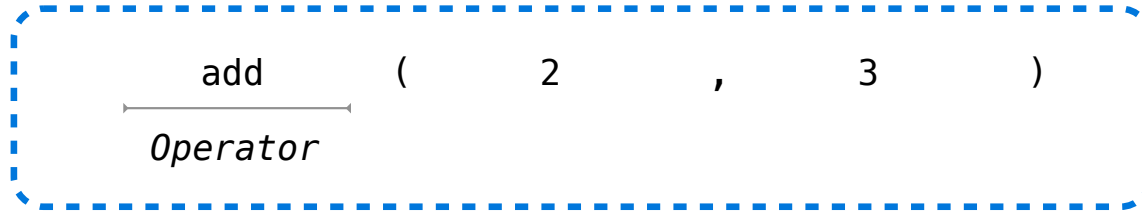
Anatomy of a Call Expression

add (2 , 3)

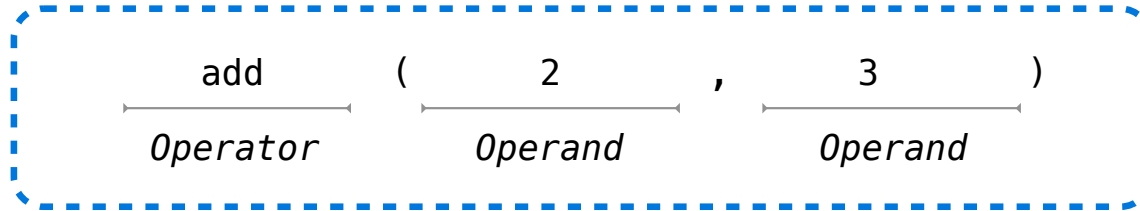
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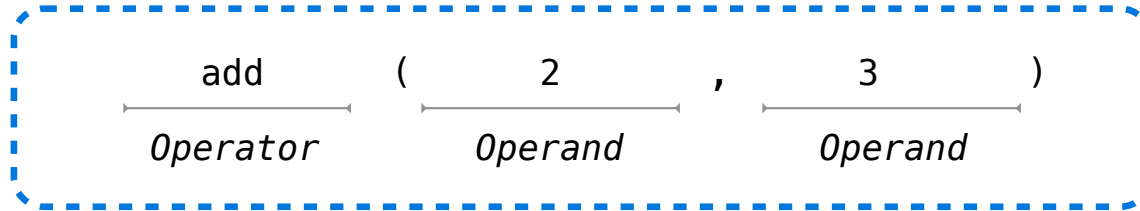
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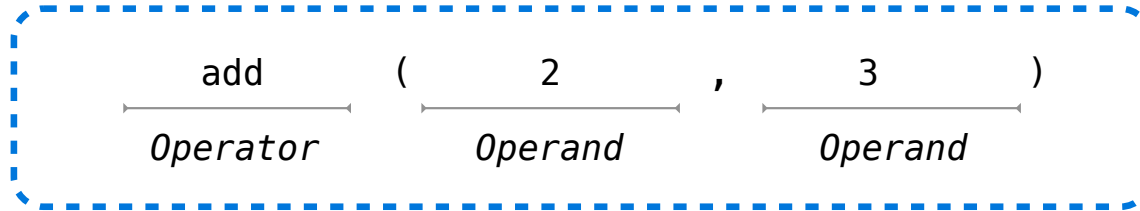


Anatomy of a Call Expression



Operators and operands are also expressions

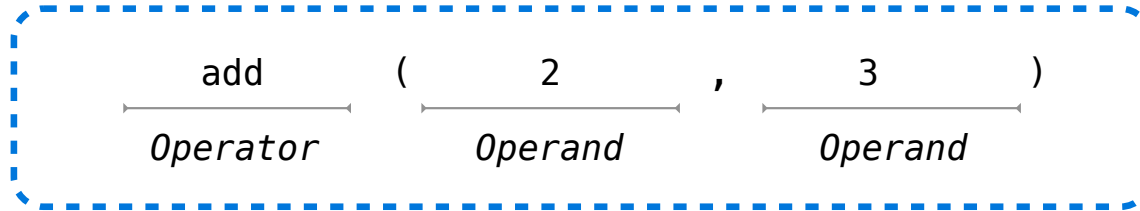
Anatomy of a Call Expression



Operators and operands are also expressions

So they evaluate to values

Anatomy of a Call Expression

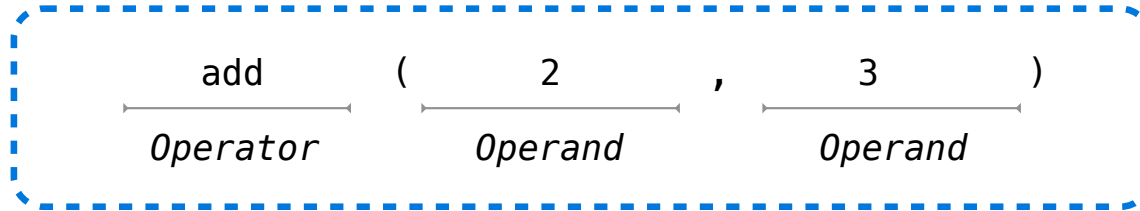


Operators and operands are also expressions

So they evaluate to values

Evaluation procedure for call expressions:

Anatomy of a Call Expression



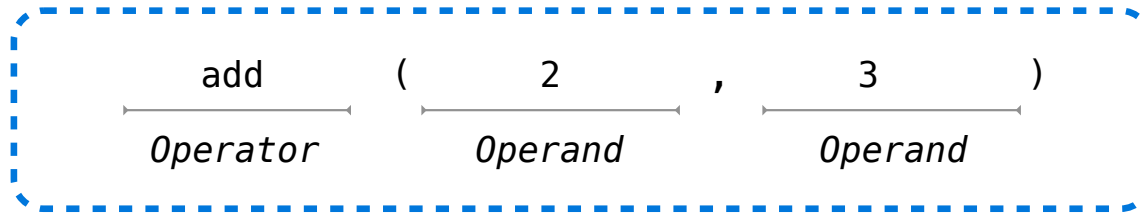
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Evaluation procedure for call expressions:

1. Evaluate the operator and then the operand subexpressions

Anatomy of a Call Expression



Operators and operands are also expressions

So they evaluate to values

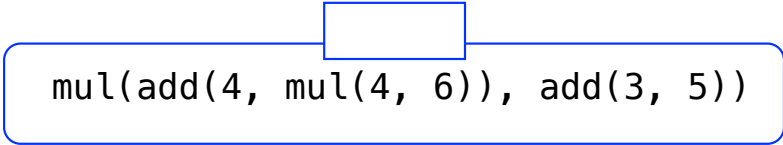
Evaluation procedure for call expressions:

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

```
mul(add(4, mul(4, 6)), add(3, 5))
```

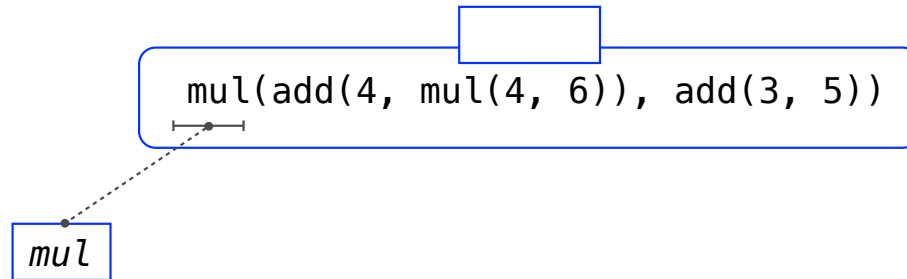
Evaluating Nested Expressions



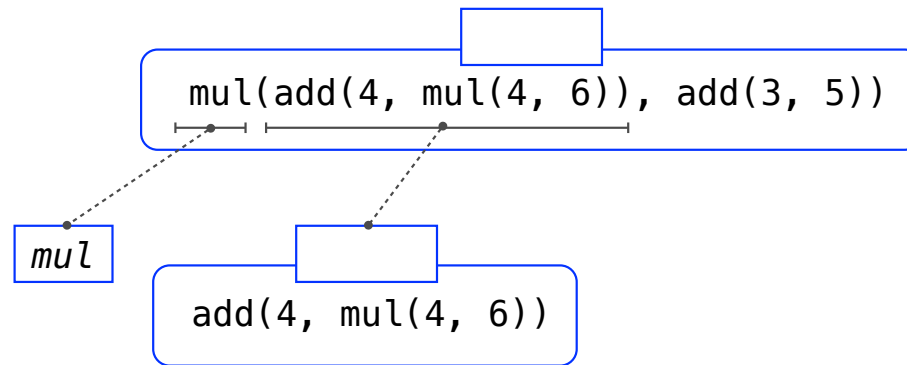
The diagram shows the expression `mul(add(4, mul(4, 6)), add(3, 5))` enclosed in a rounded rectangular box. A smaller, empty rectangular box is positioned above the `mul(4, 6)` sub-expression, indicating the current step in the evaluation process.

```
mul(add(4, mul(4, 6)), add(3, 5))
```

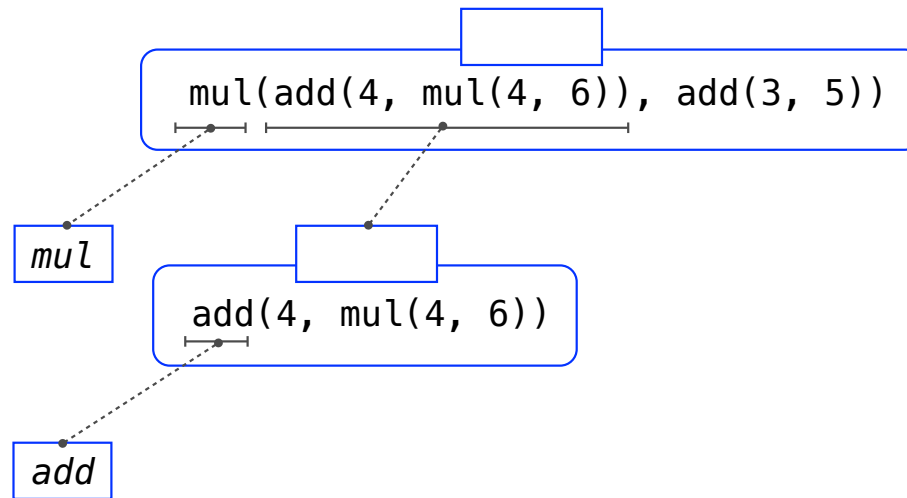
Evaluating Nested Expressions



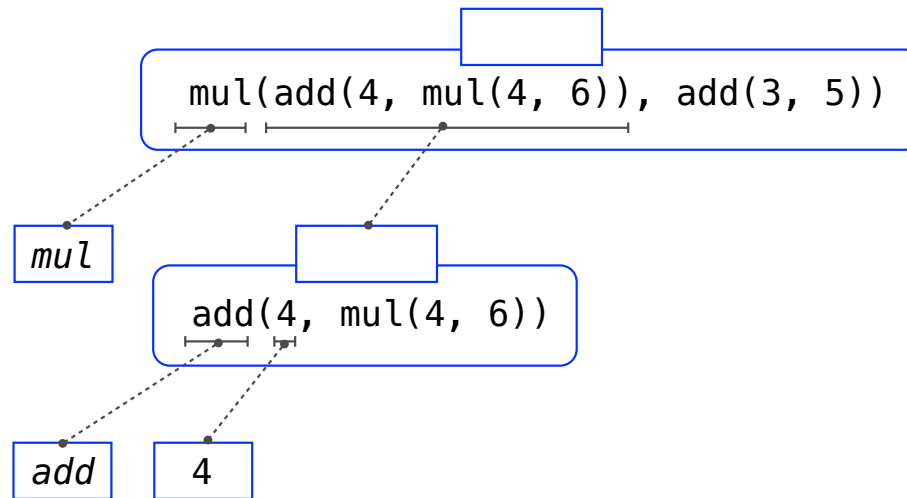
Evaluating Nested Expressions



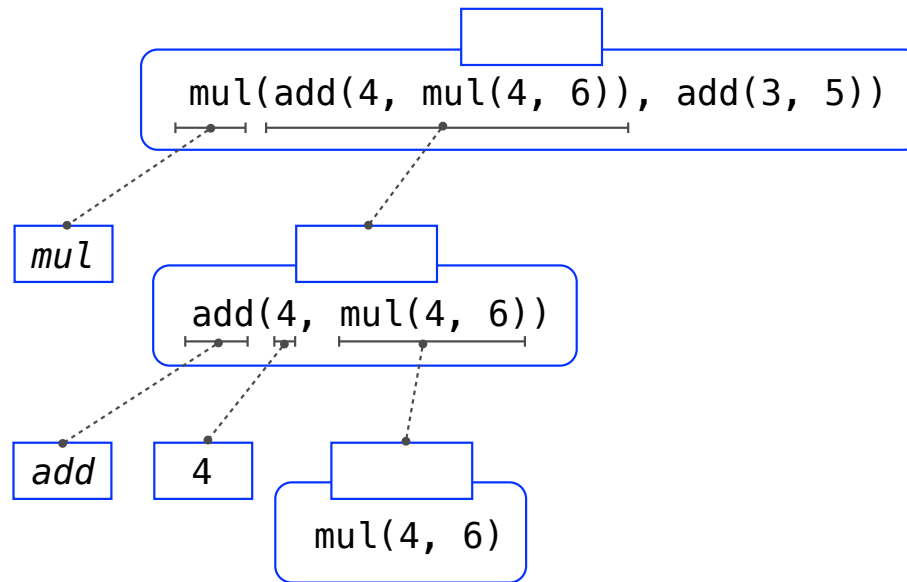
Evaluating Nested Expressions



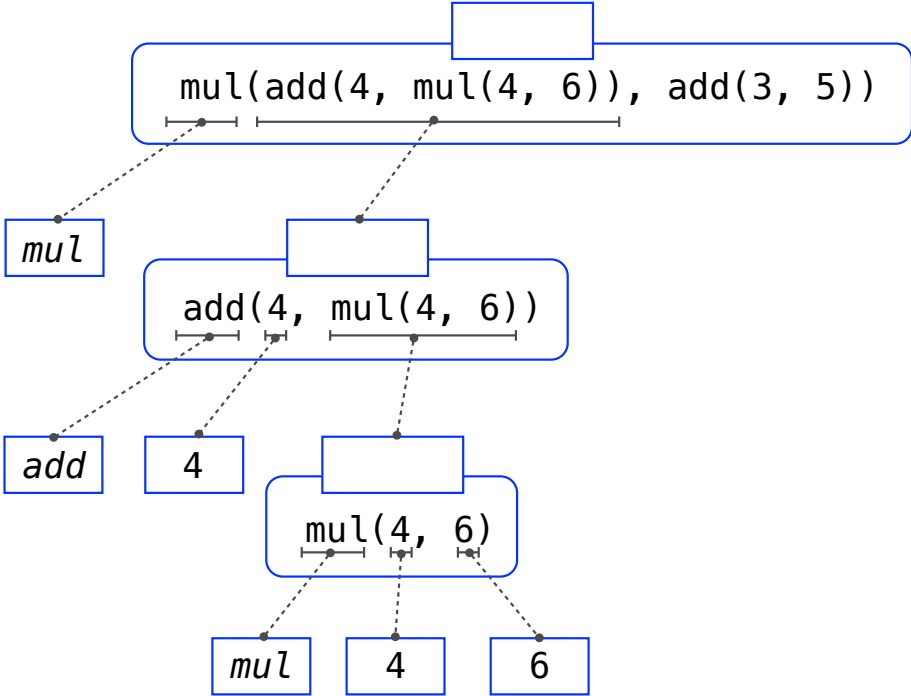
Evaluating Nested Expressions



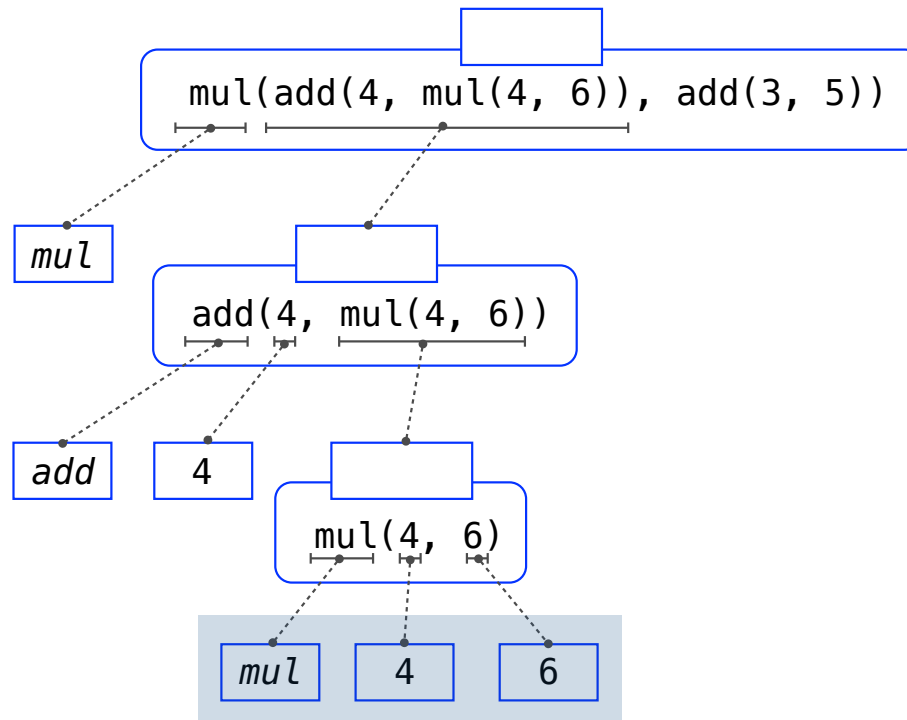
Evaluating Nested Expressions



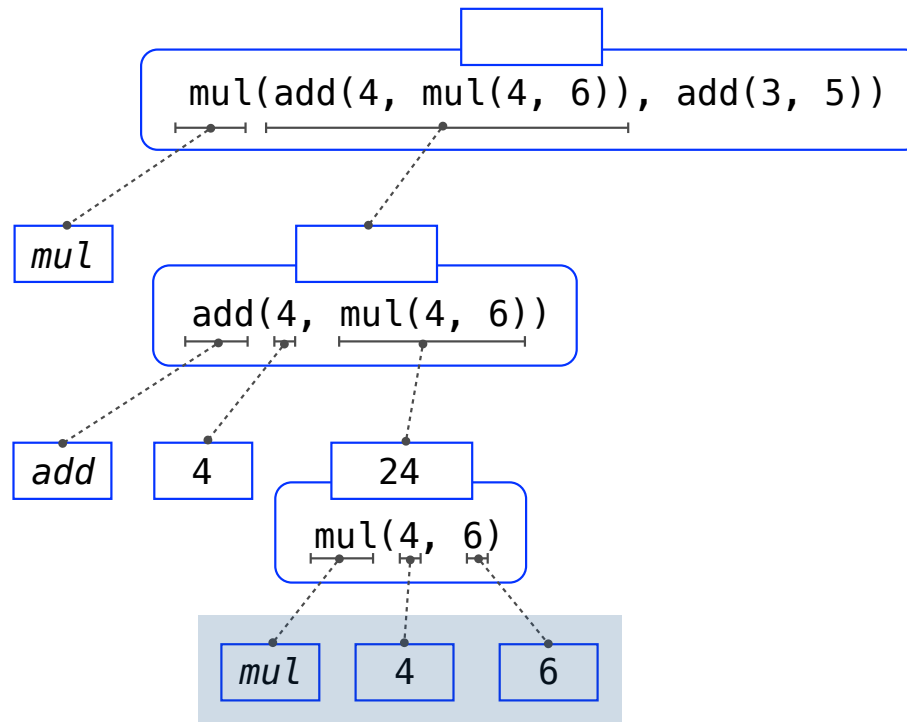
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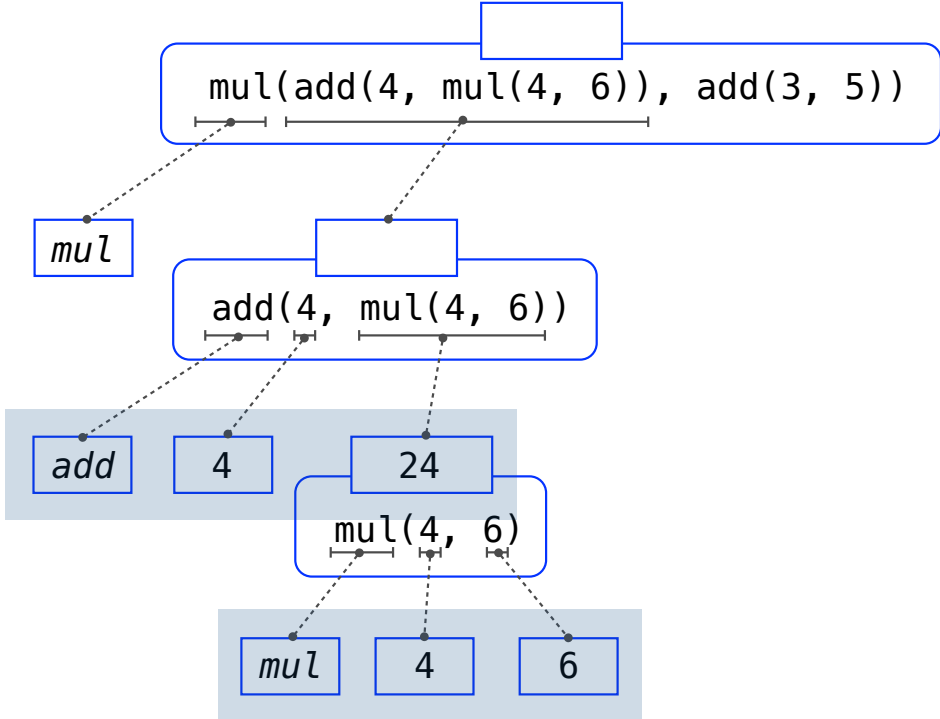
Evaluating Nested Expressions



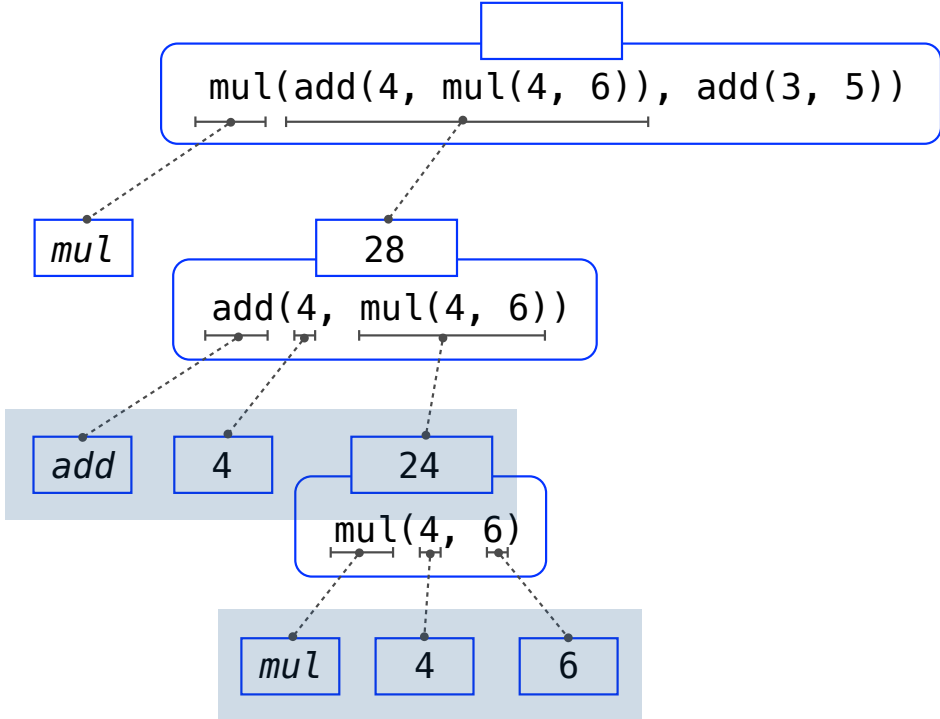
Evaluating Nested Expressions



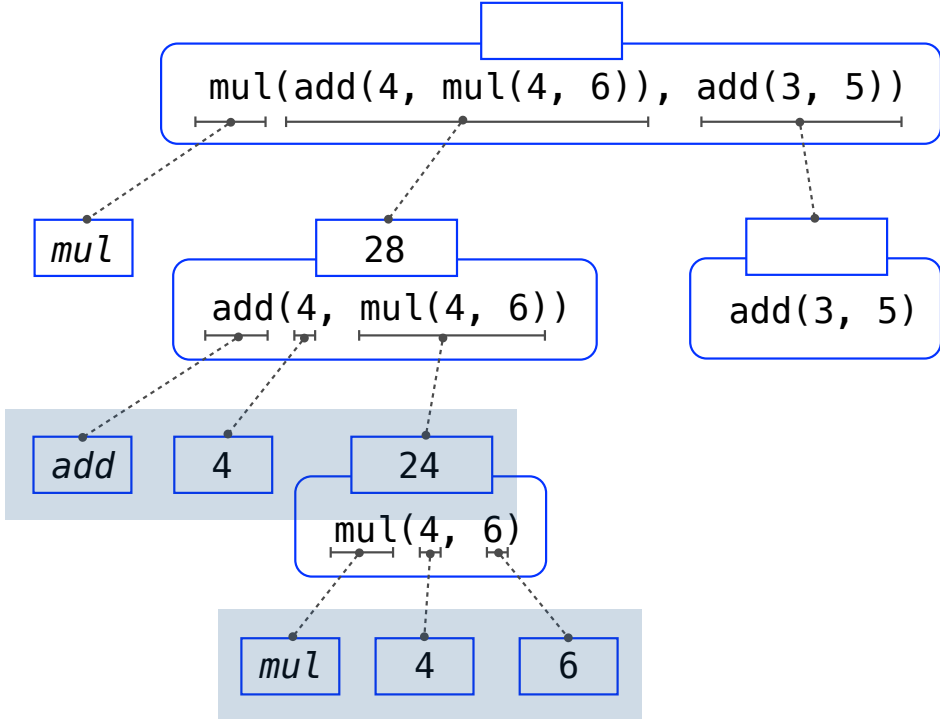
Evaluating Nested Expressions



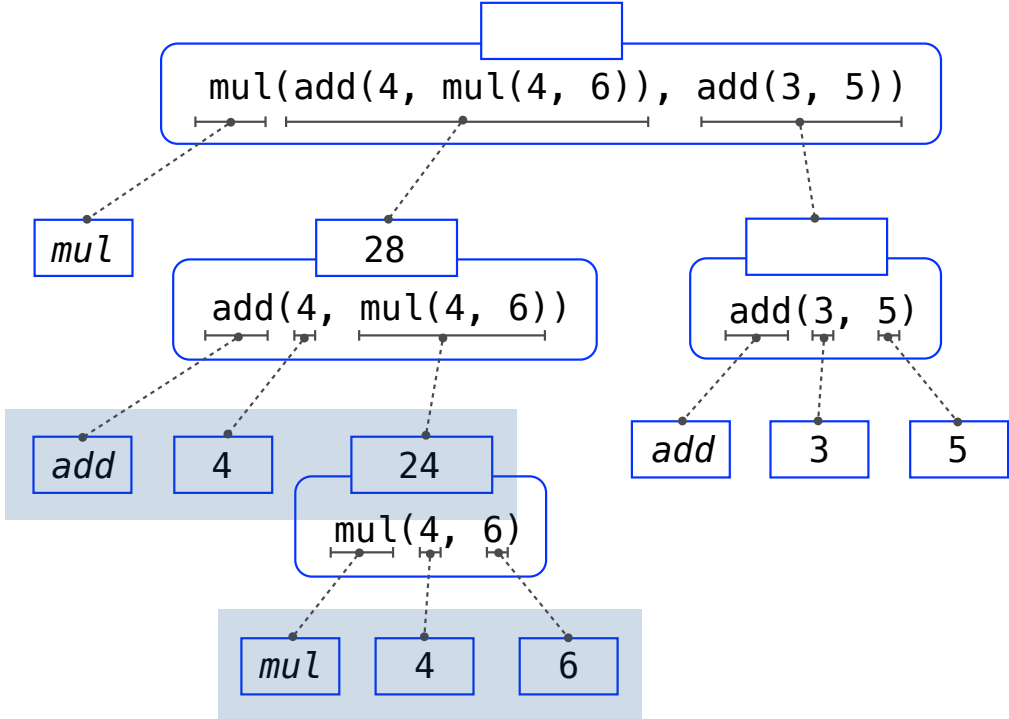
Evaluating Nested Expressions



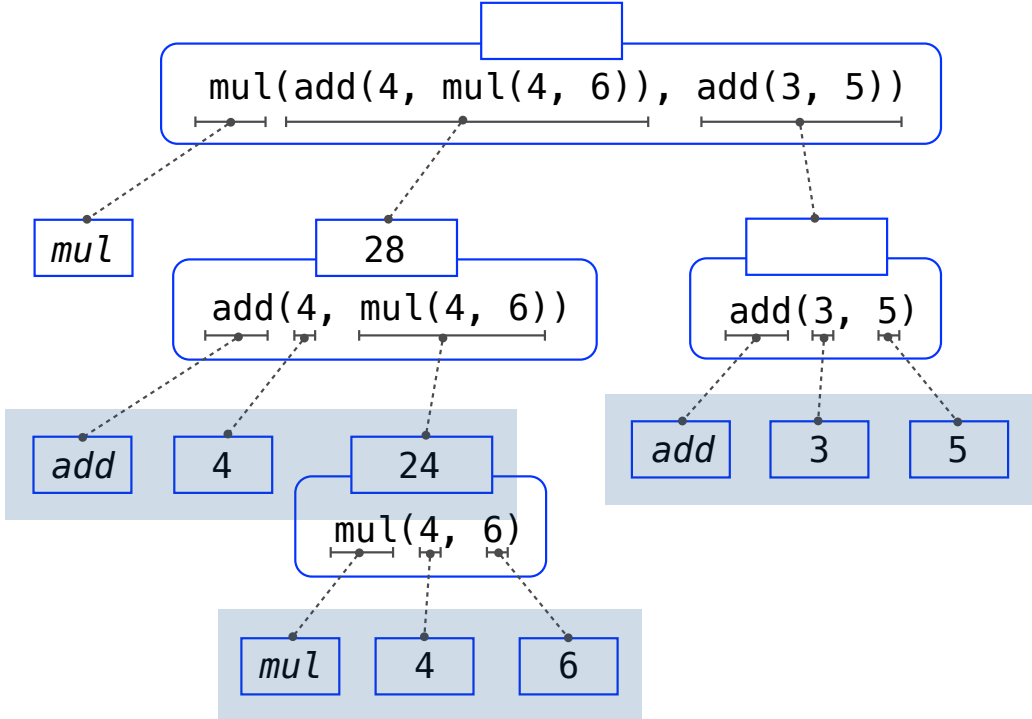
Evaluating Nested Expressions



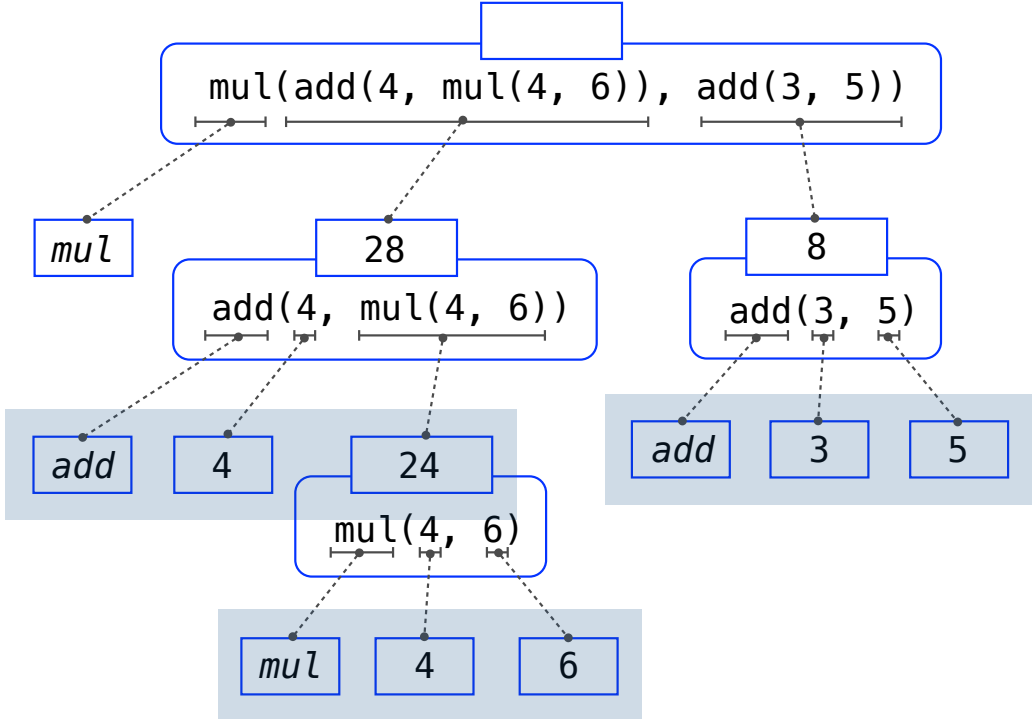
Evaluating Nested Expressions



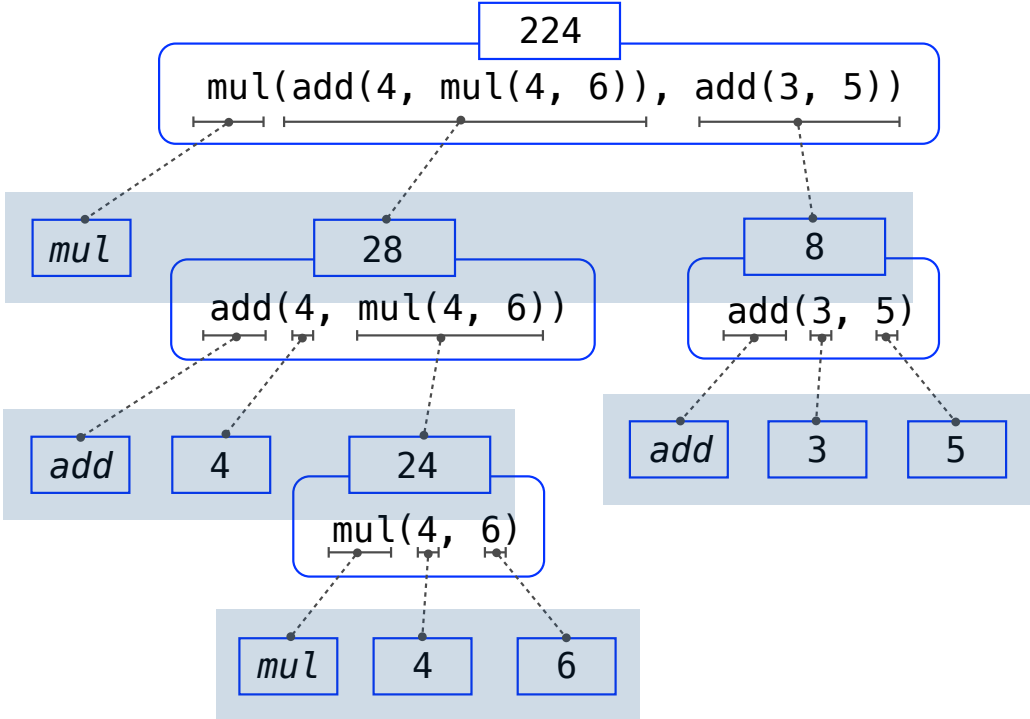
Evaluating Nested Expressions



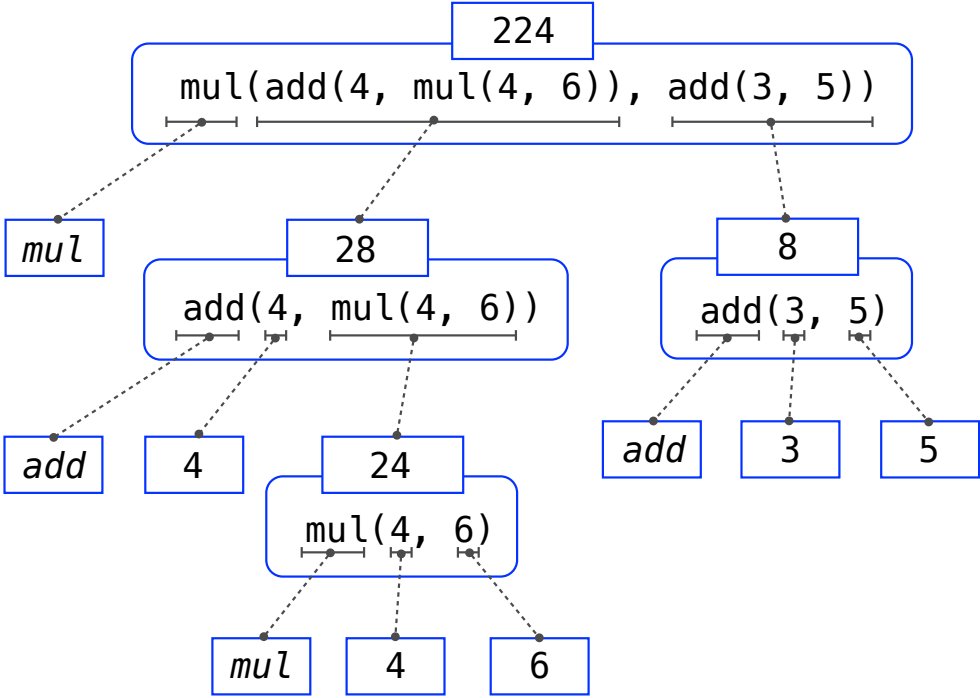
Evaluating Nested Expressions



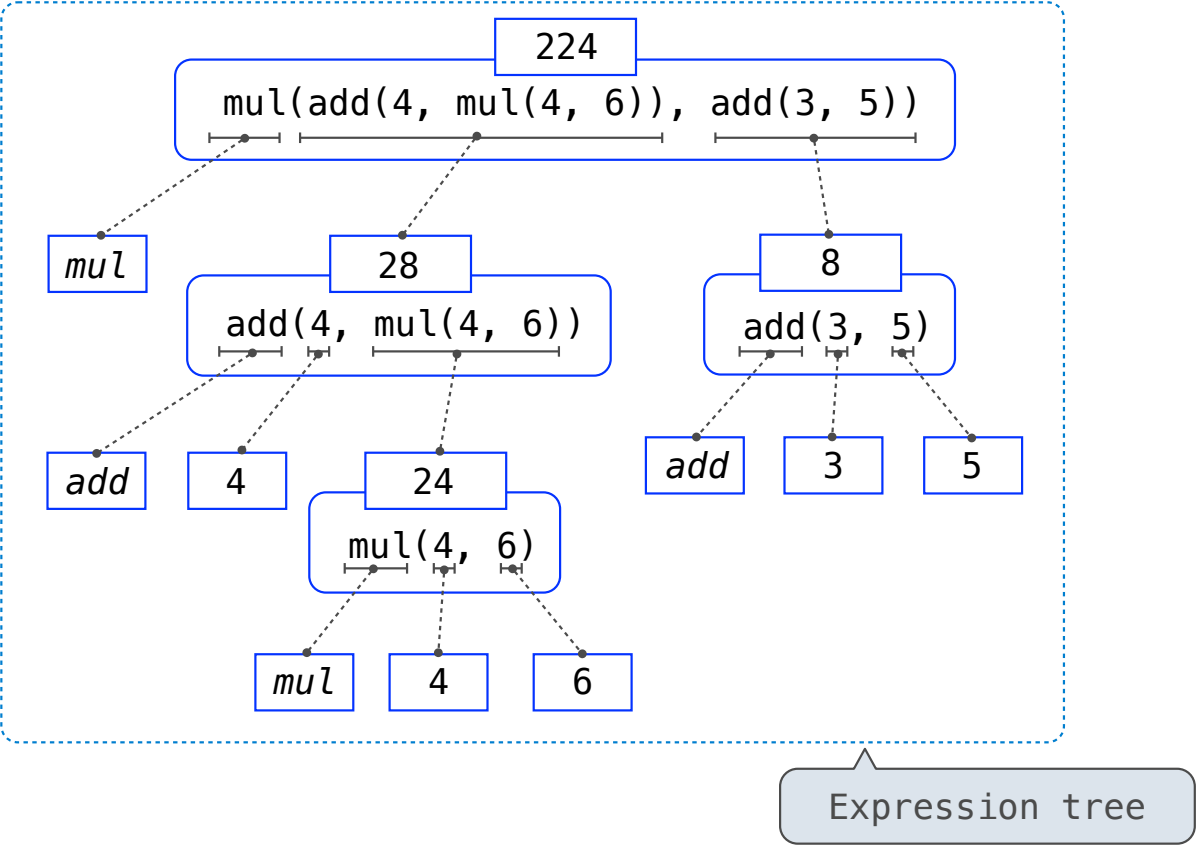
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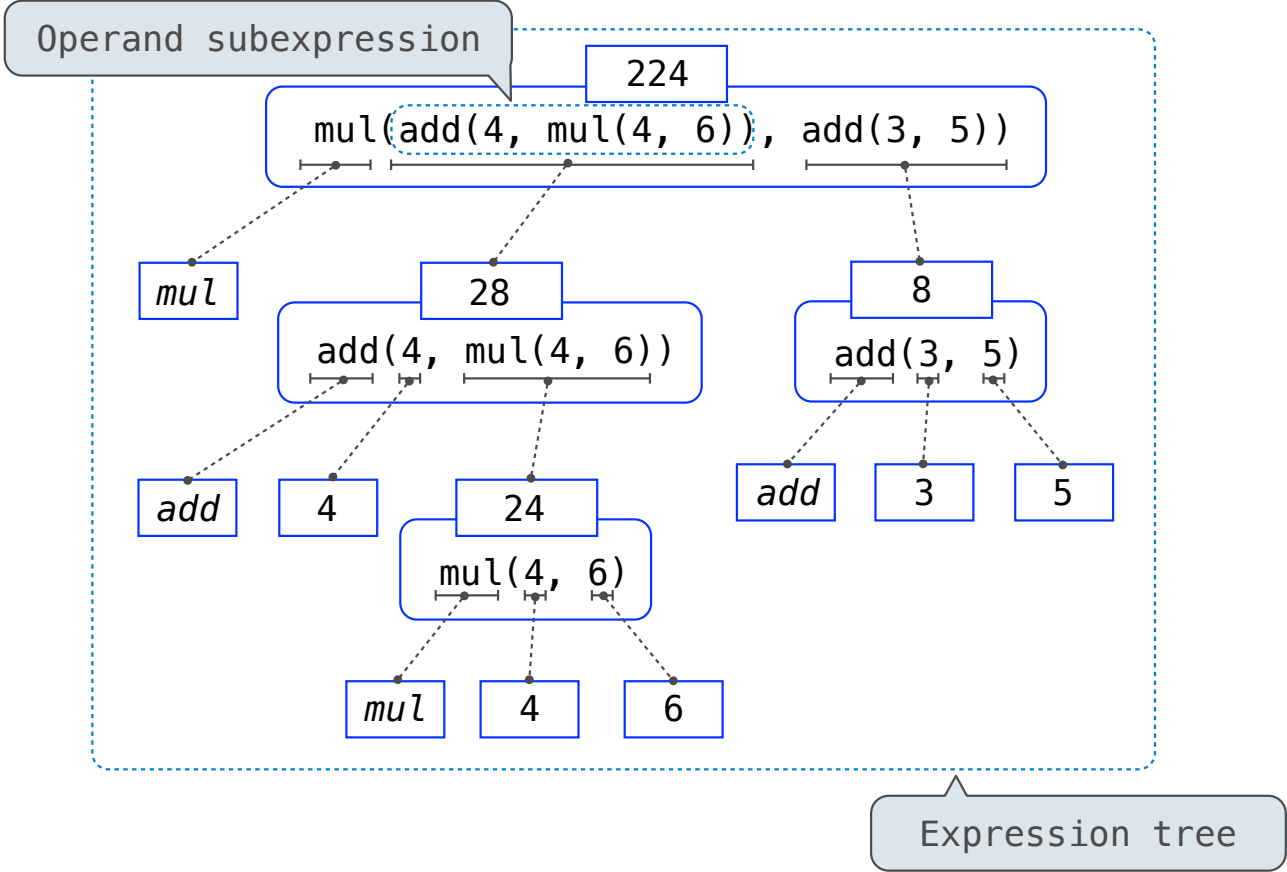
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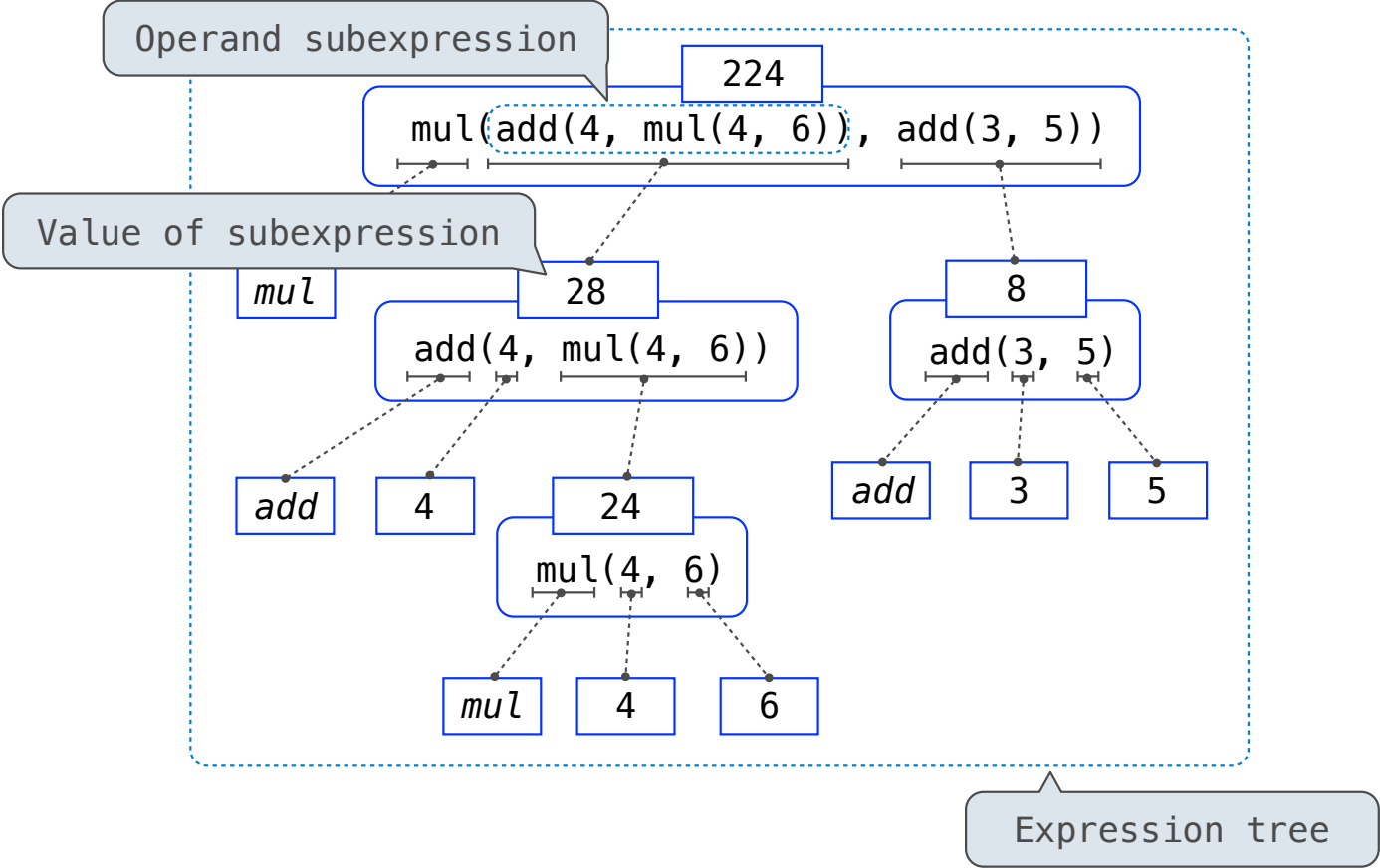
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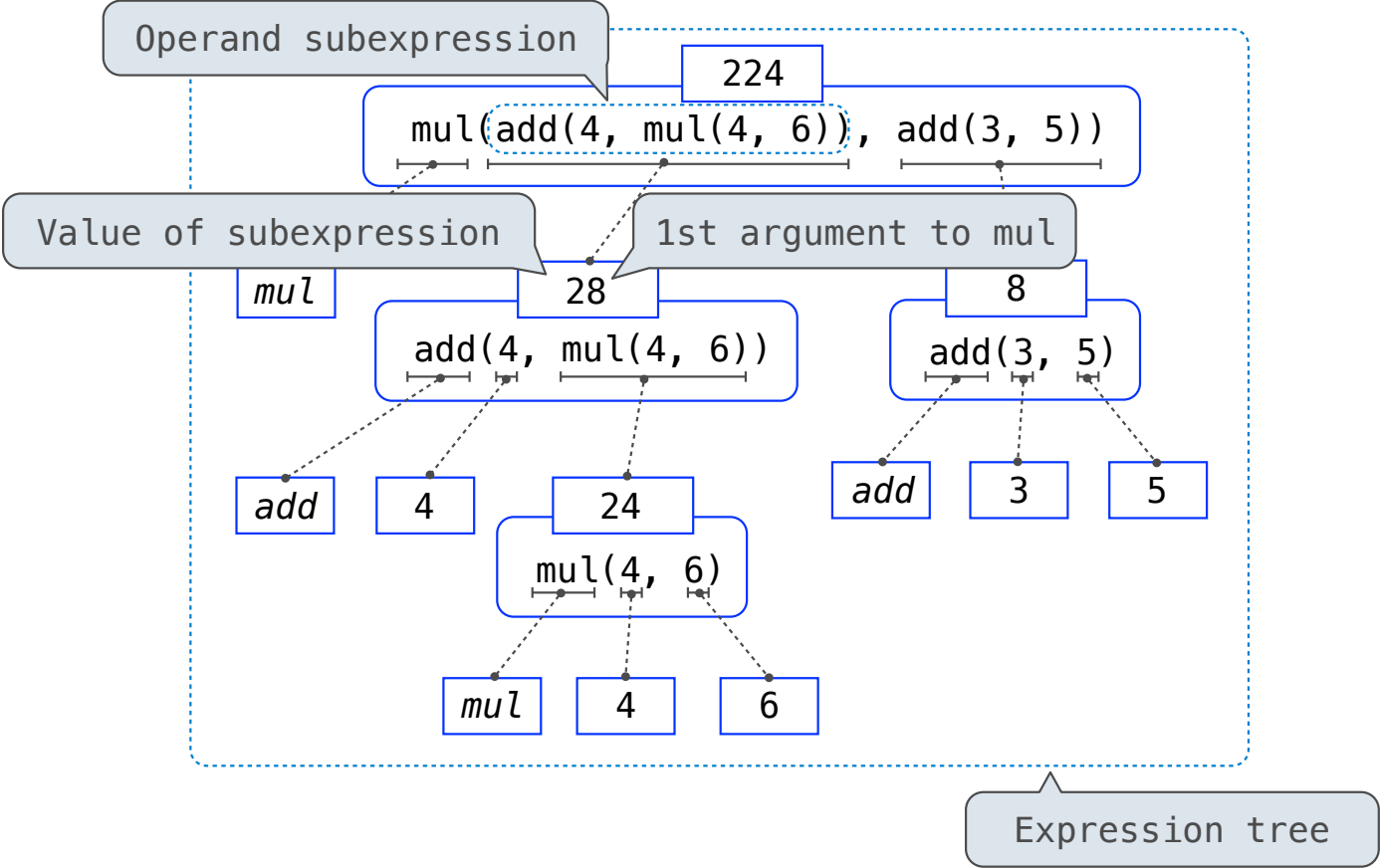
Evaluating Nested Expressions



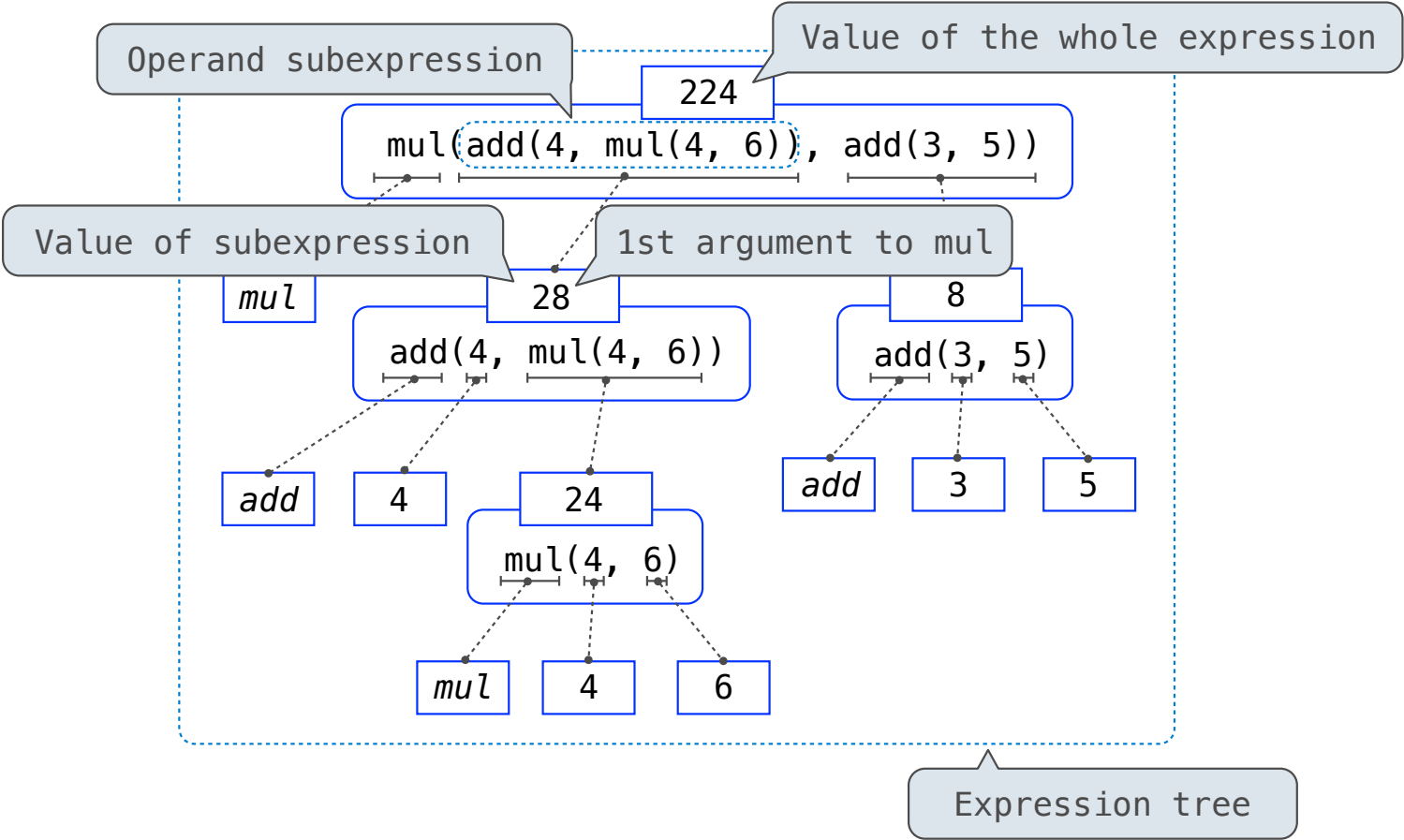
Evaluating Nested Expressions



Evaluating Nested Expressions



Evaluating Nested Expressions



Functions, Values, Objects, Interpreters, and Data

(Demo)