Functions

An Introduction to Computer Science

What is Computer Science?

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What problems can be solved using computation,

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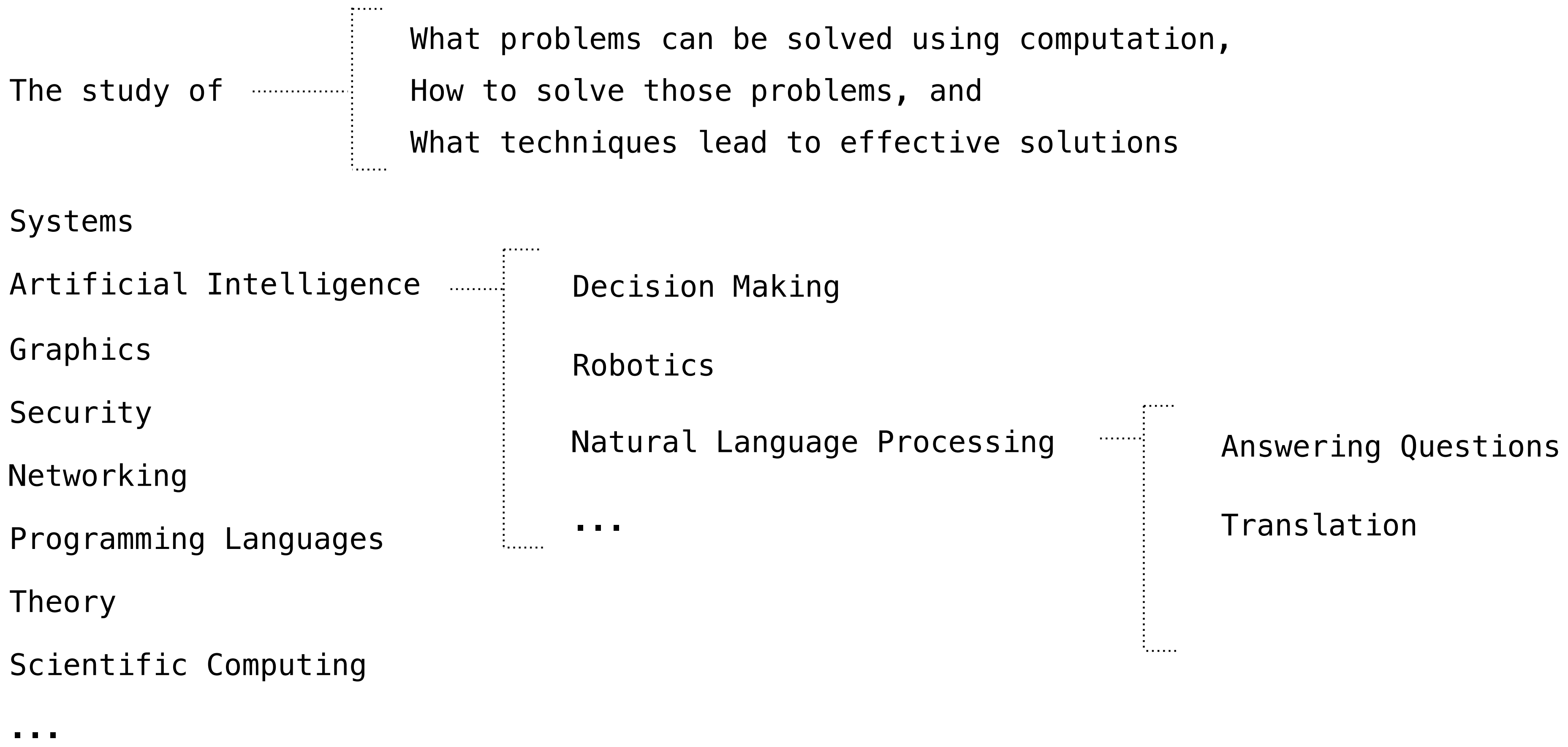

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A course about managing complexity

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Mastering abstraction

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  - How computers interpret programming languages
- Different types of languages: Scheme & SQL

Course Policies

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Learning

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Community

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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

- One simple rule: Don’t share your code, except with your project partner

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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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Call Expressions in Python

`All expressions can use function call notation`

`(Demo)`

Anatomy of a Call Expression

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```
add        (         2          ,          3          )
```

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```
add    (    2     ,     3     )
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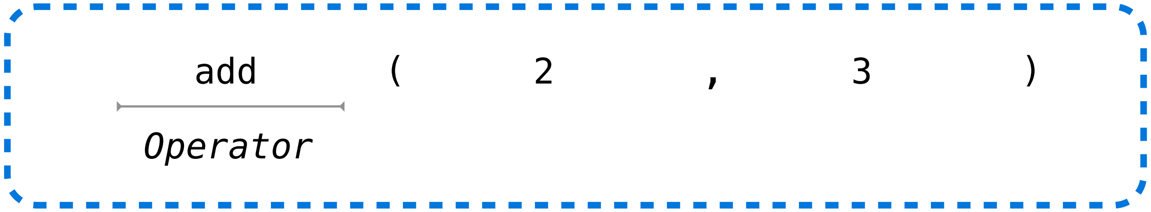
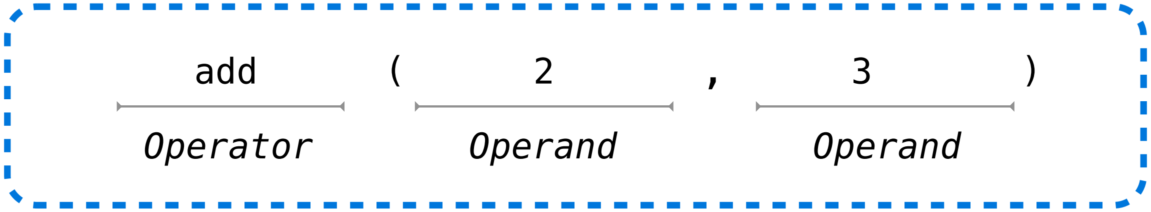
Anatomy of a Call Expression



```
add ( 2 , 3 )
```

Anatomy of a Call Expression



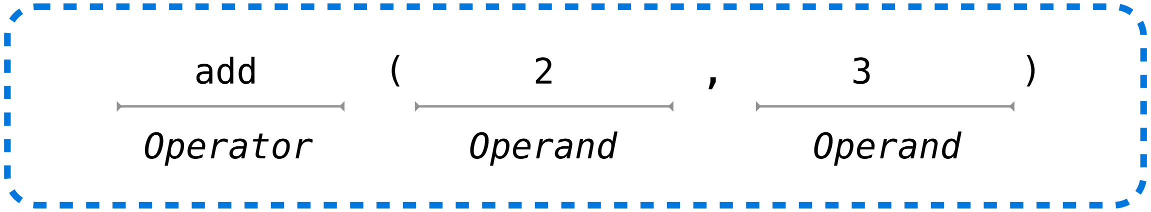
add (2 , 3)

Operator

Operand

Operand

Anatomy of a Call Expression

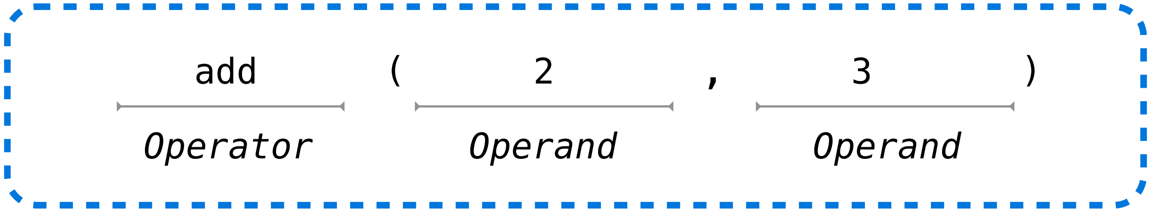


add (2 , 3)

Operator *Operand* *Operand*

Operators and operands are also expressions

Anatomy of a Call Expression



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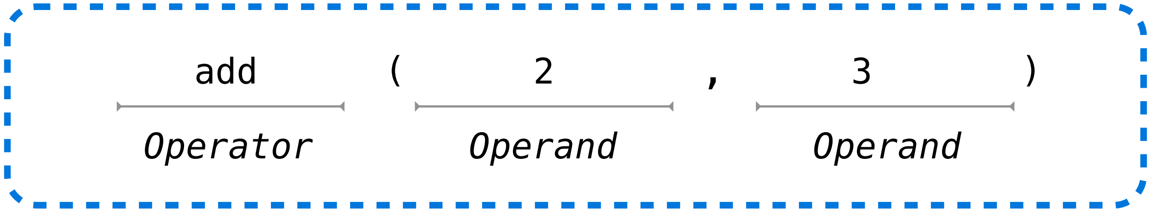

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Evaluation procedure for call expressions:

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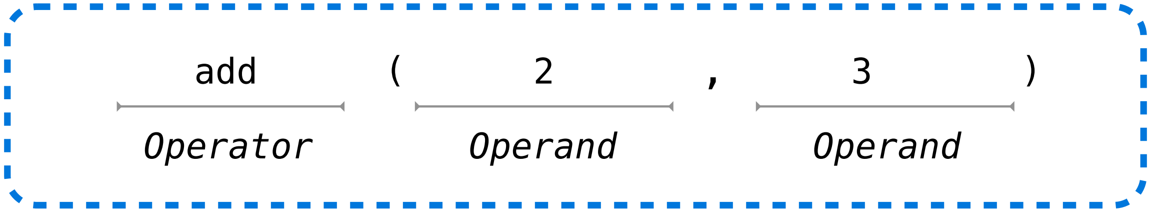

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Evaluation procedure for call expressions:

1. Evaluate the operator and then the operand subexpressions

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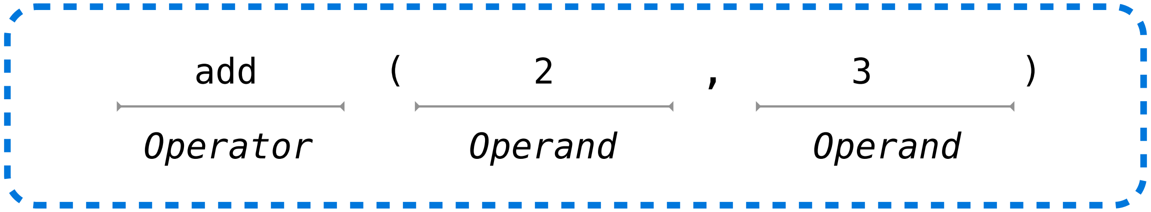

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Evaluation procedure for call expressions:

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))
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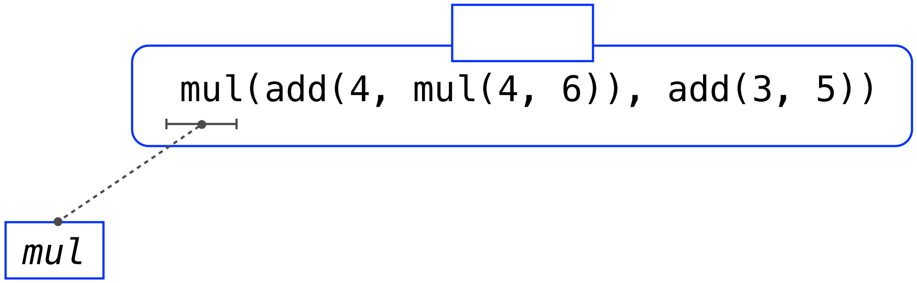

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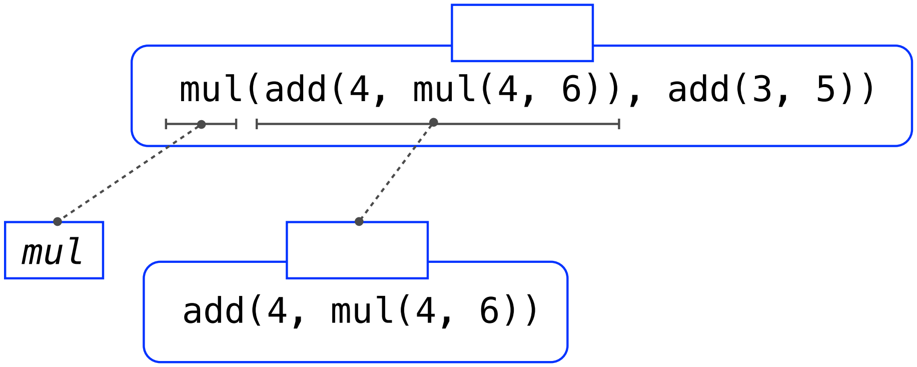

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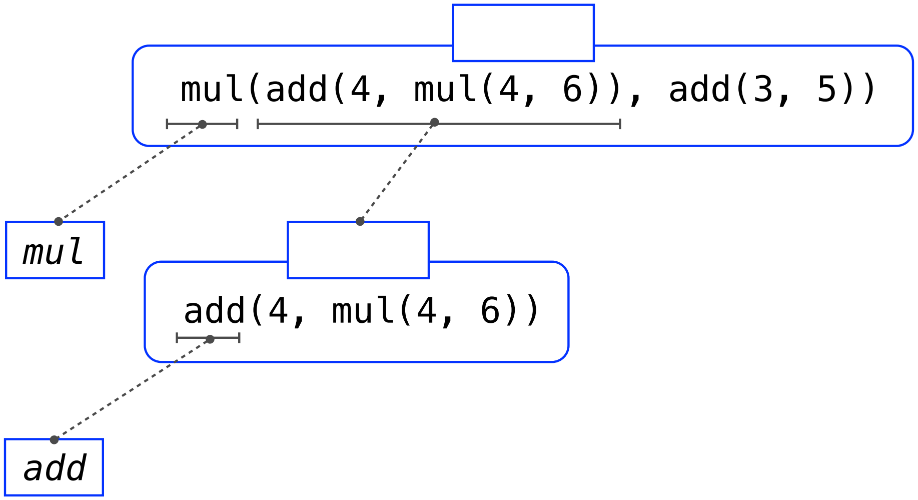

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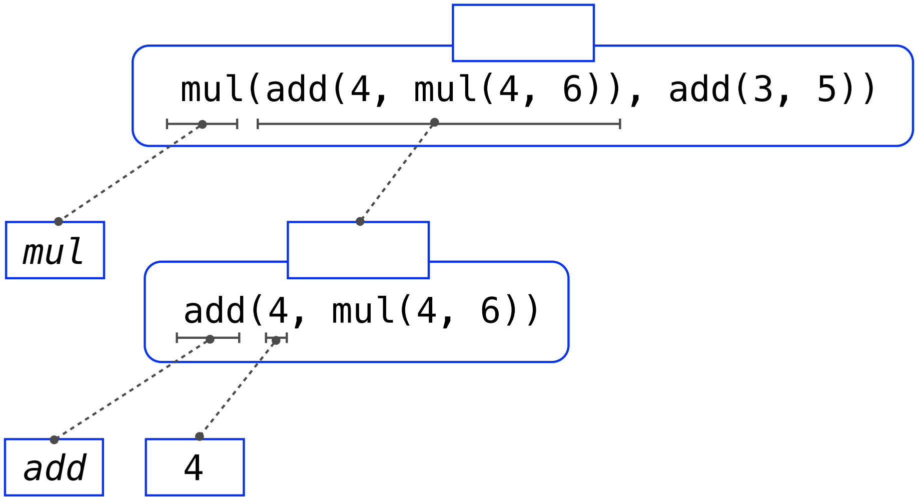

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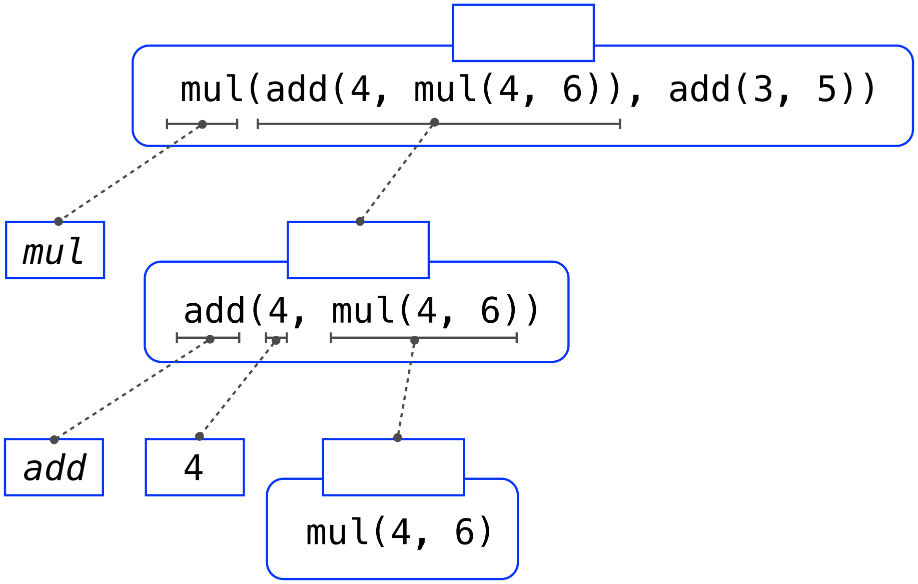

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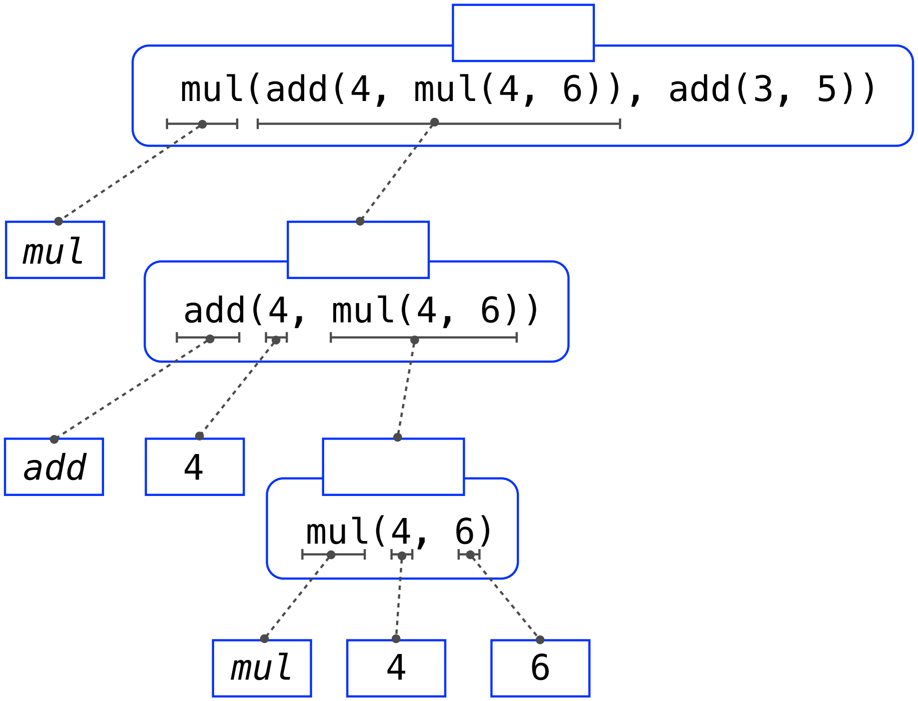

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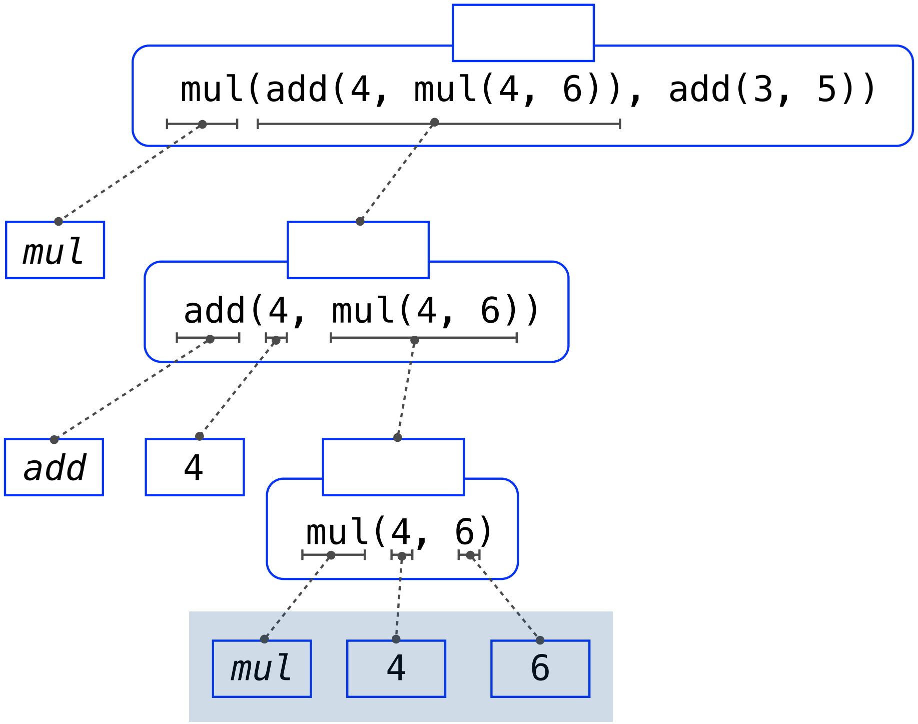

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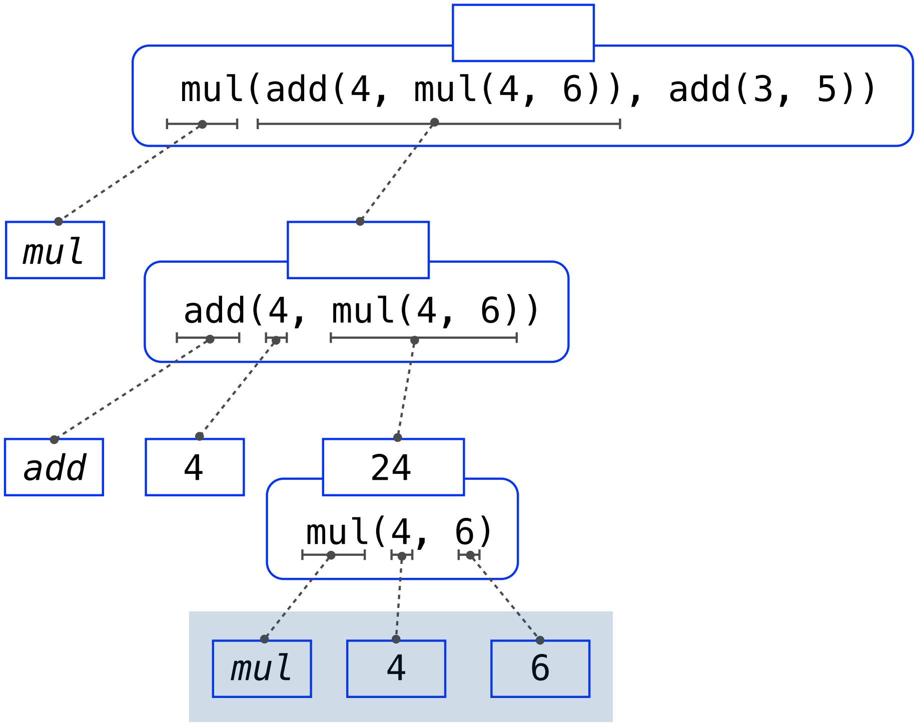

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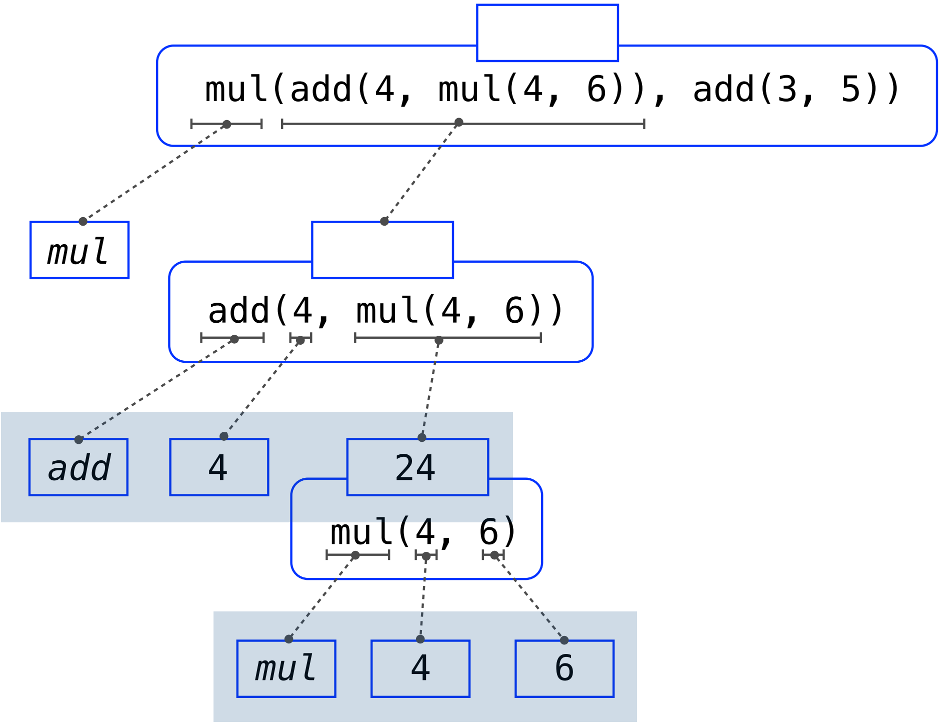

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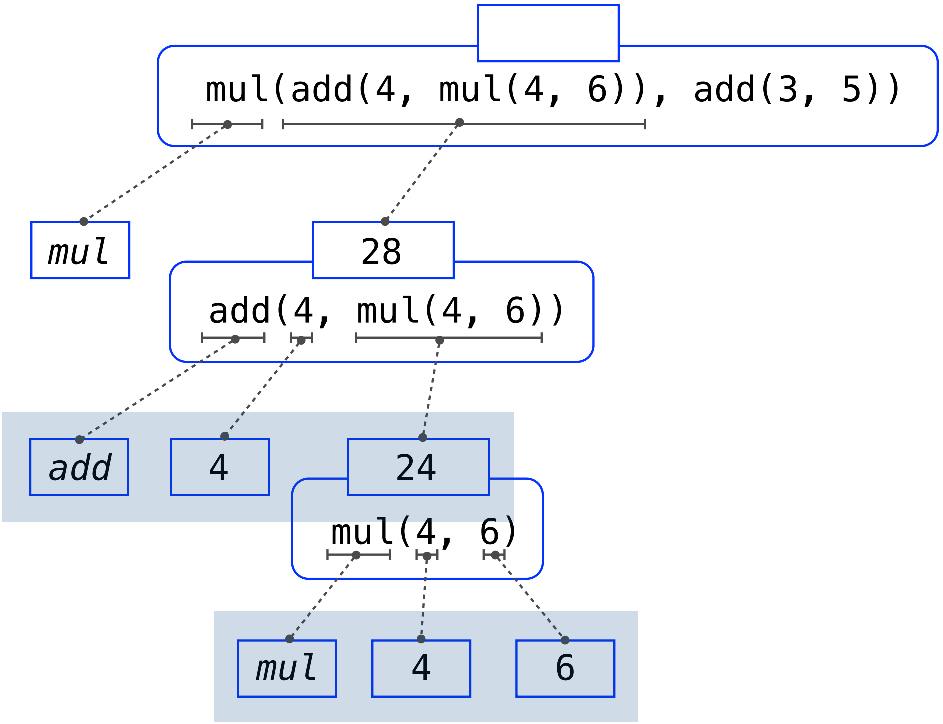

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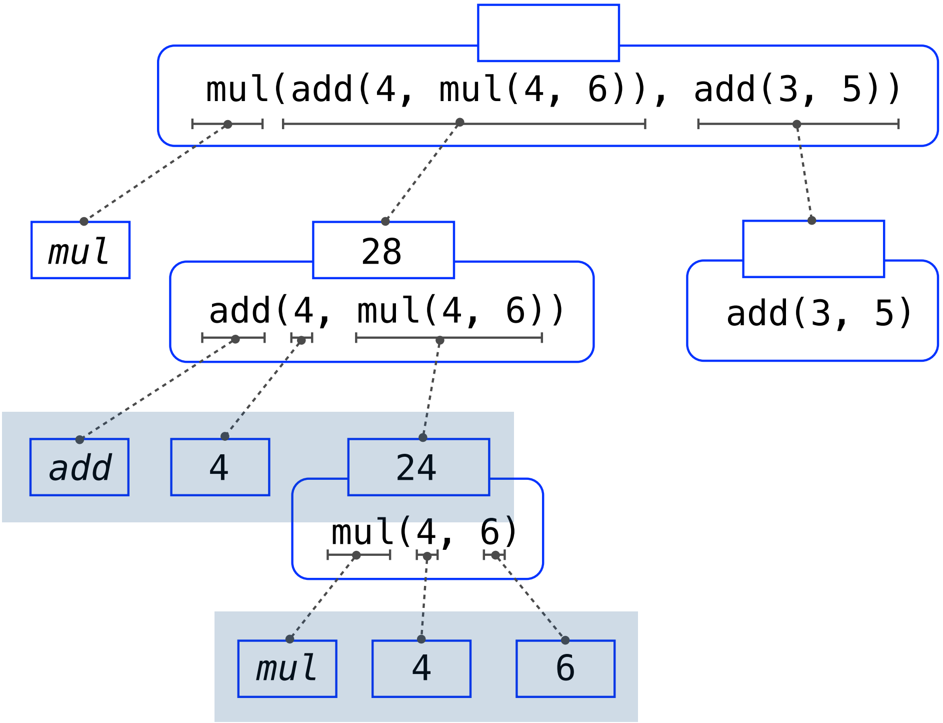

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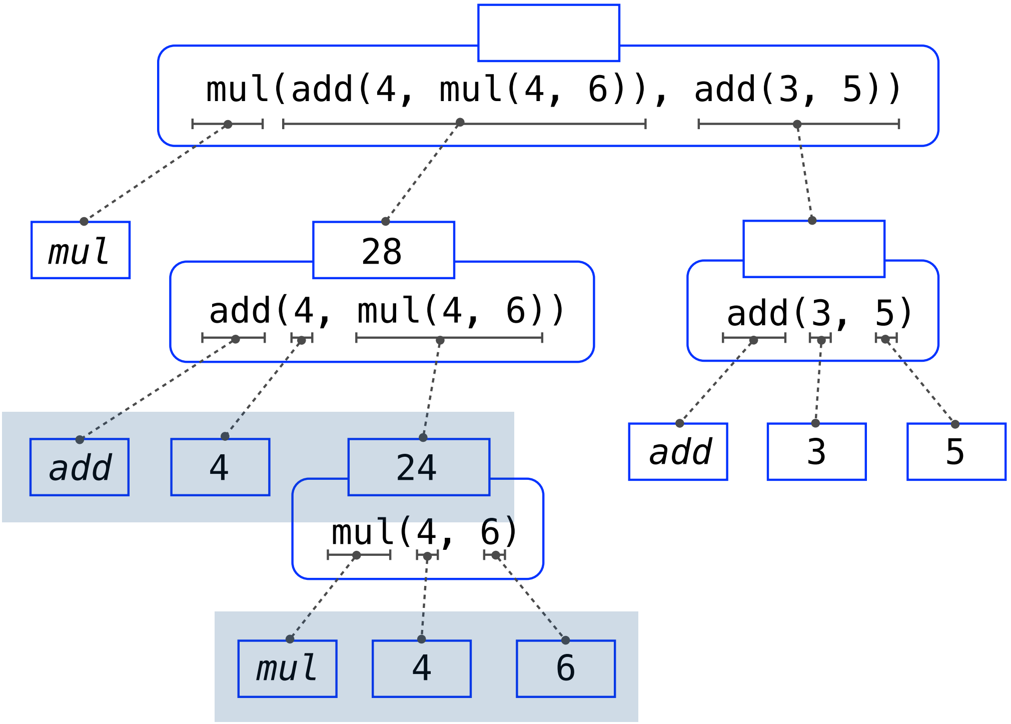

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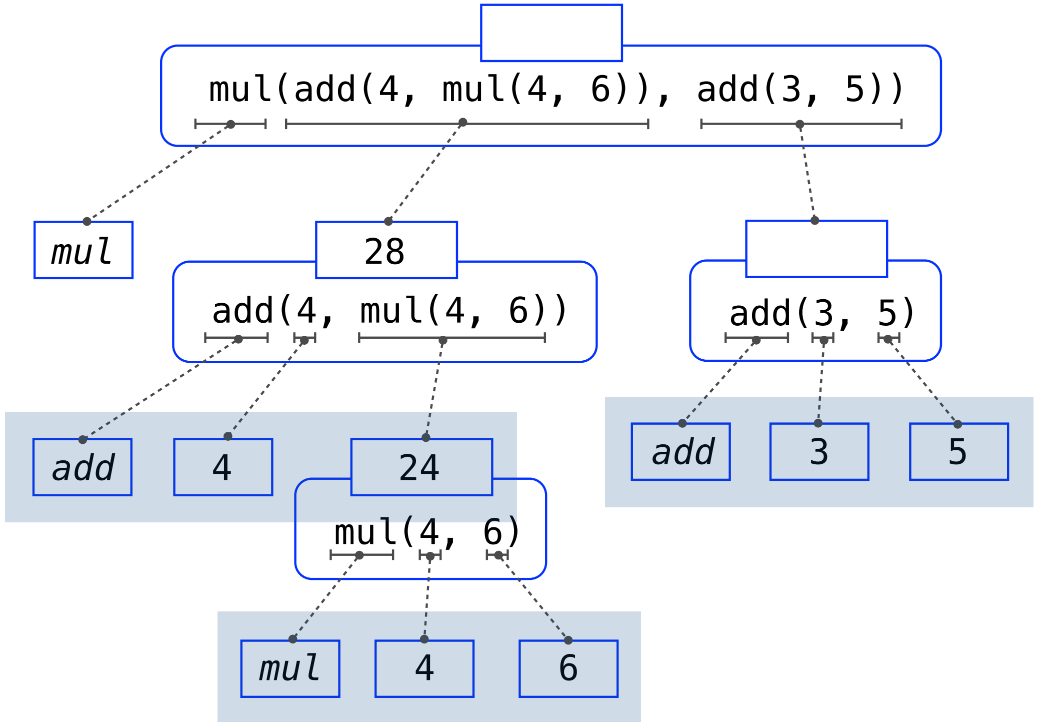

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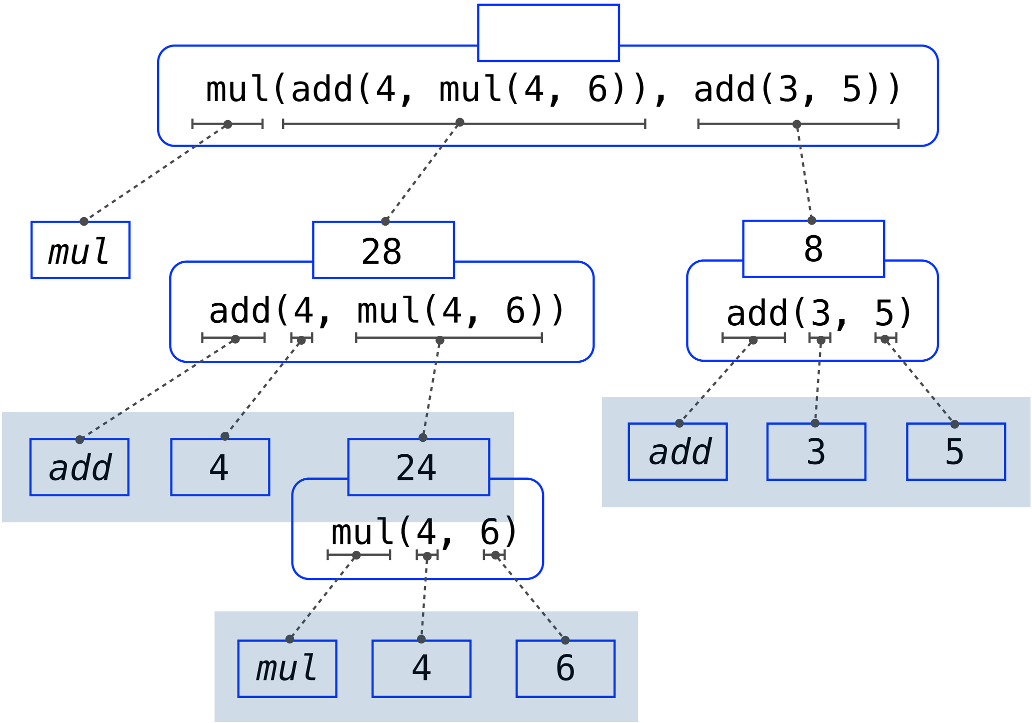

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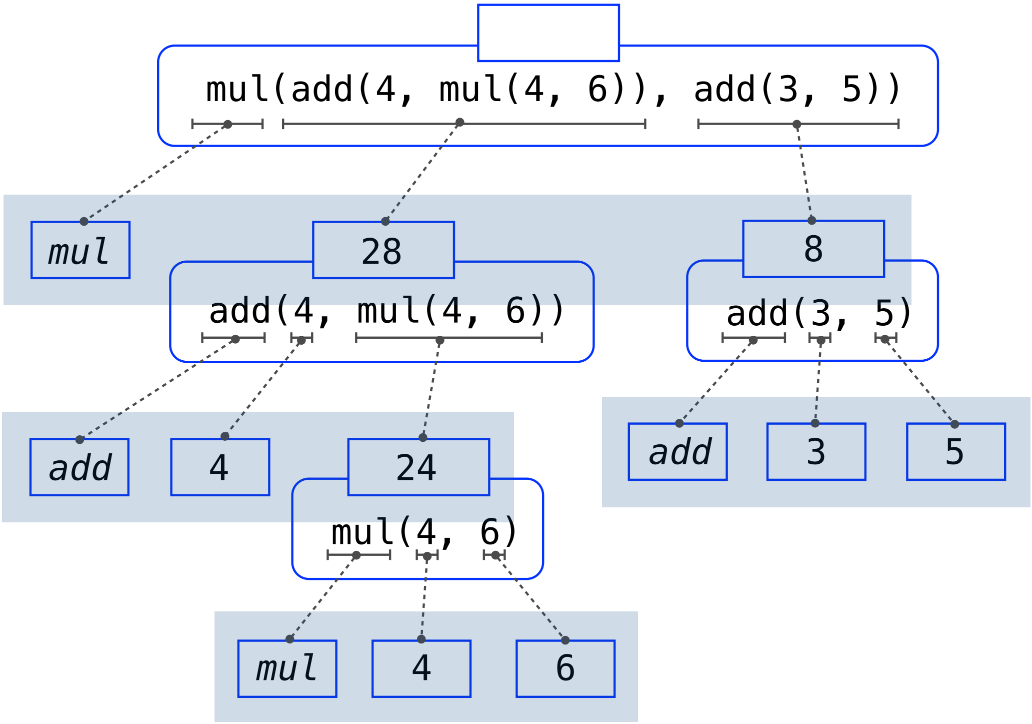

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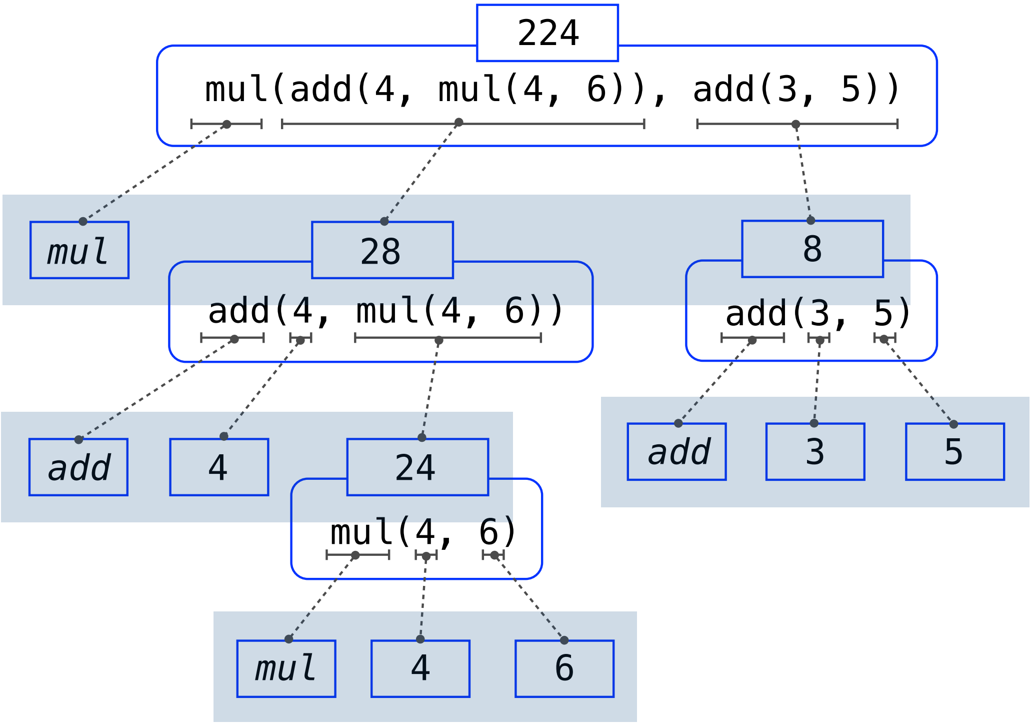

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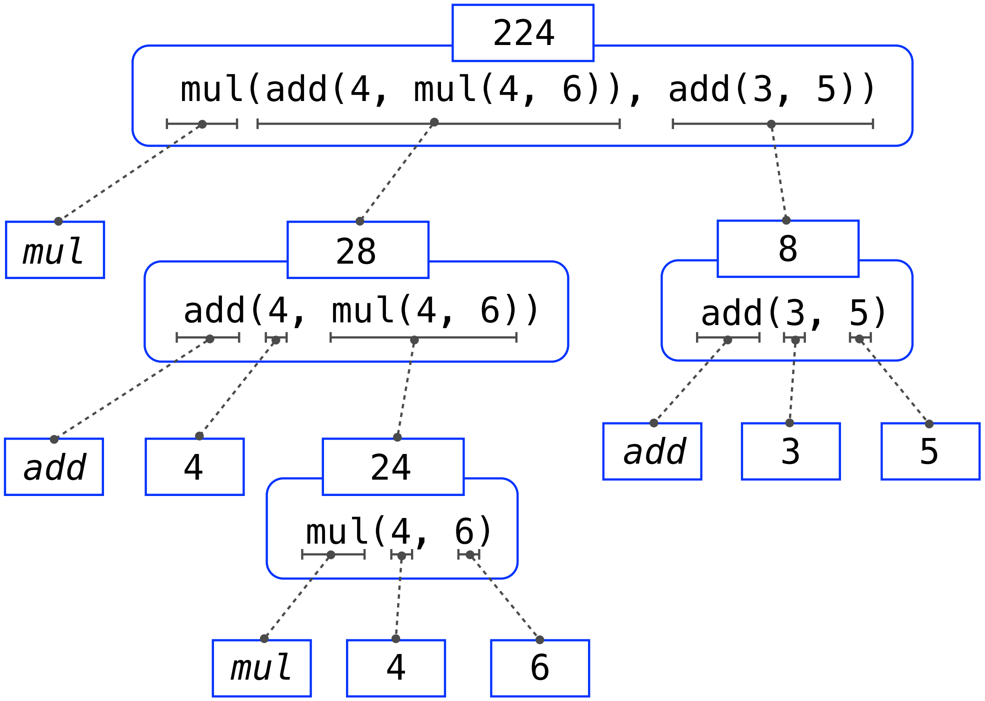

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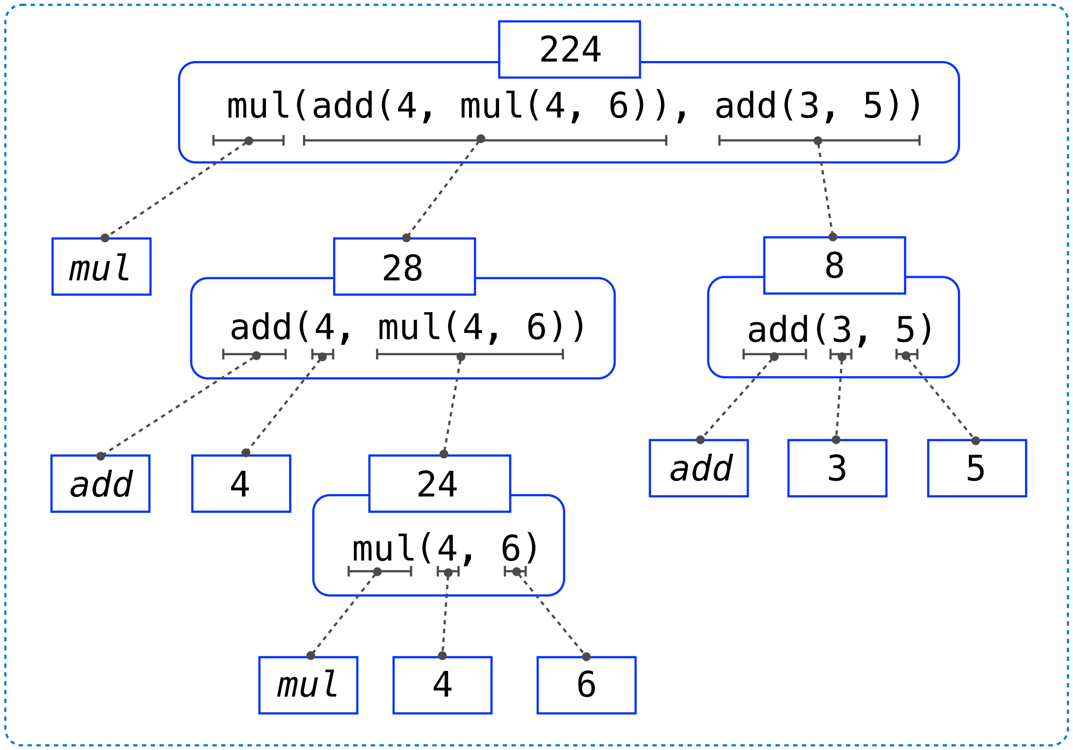
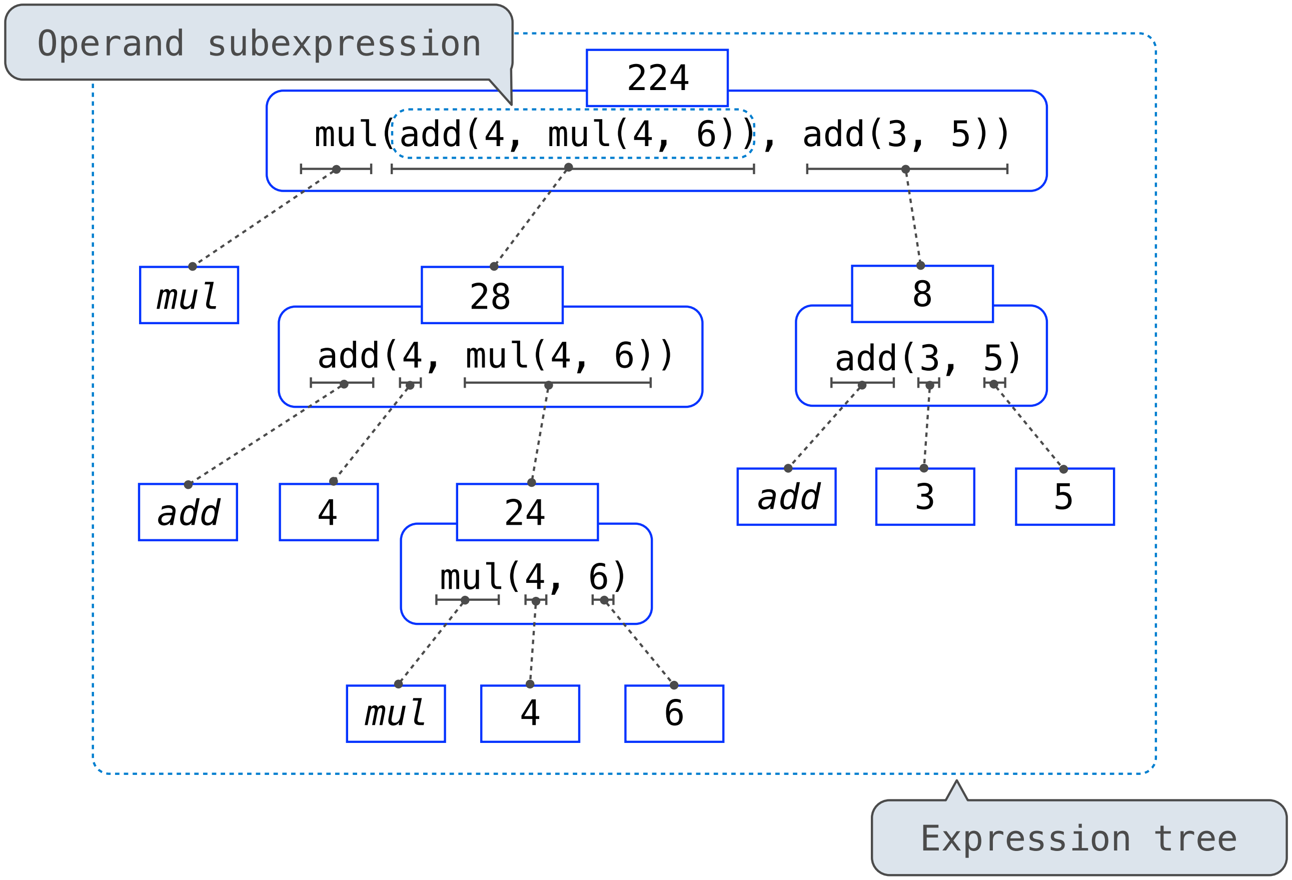


Expression tree

Evaluating Nested Expressions



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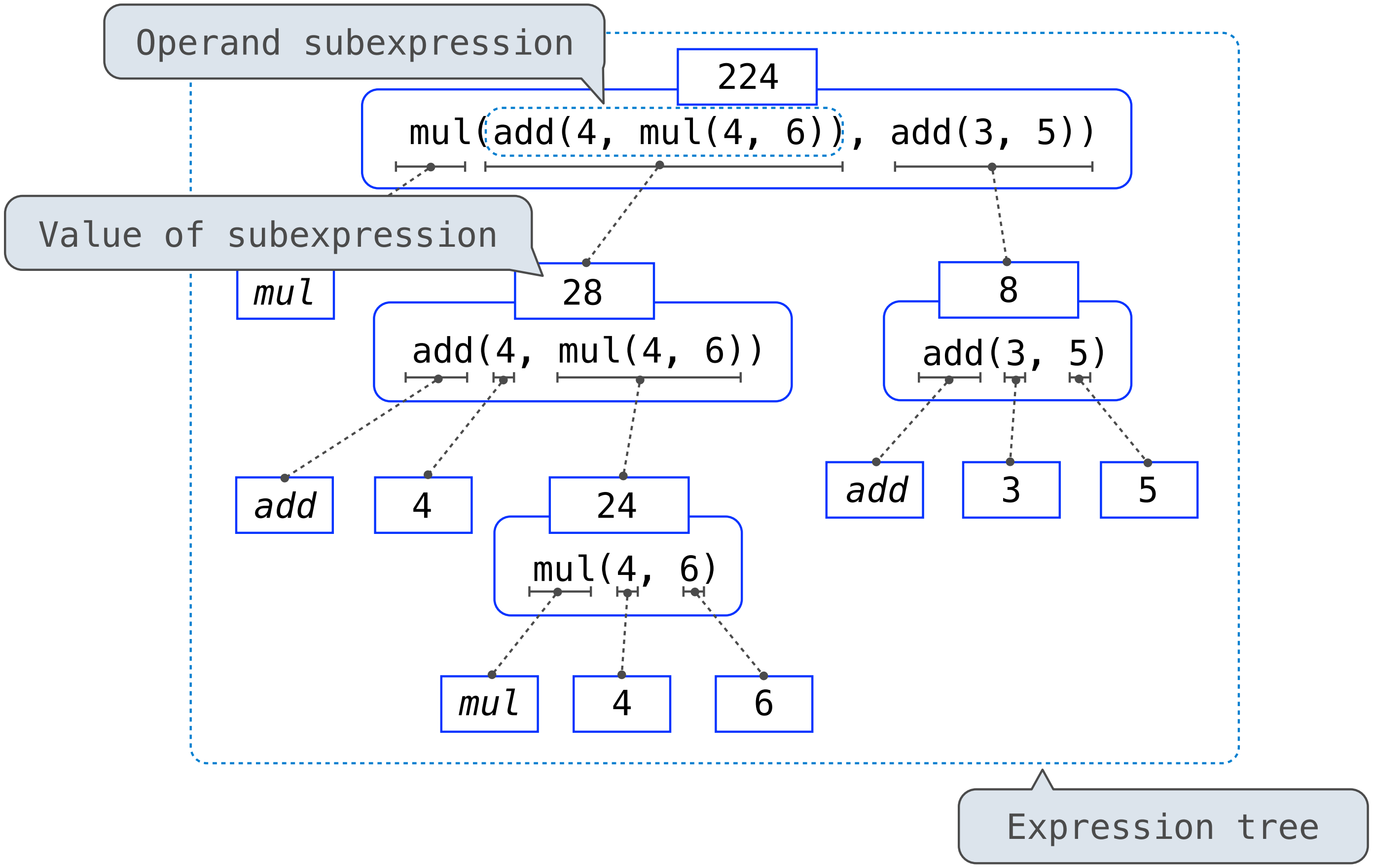

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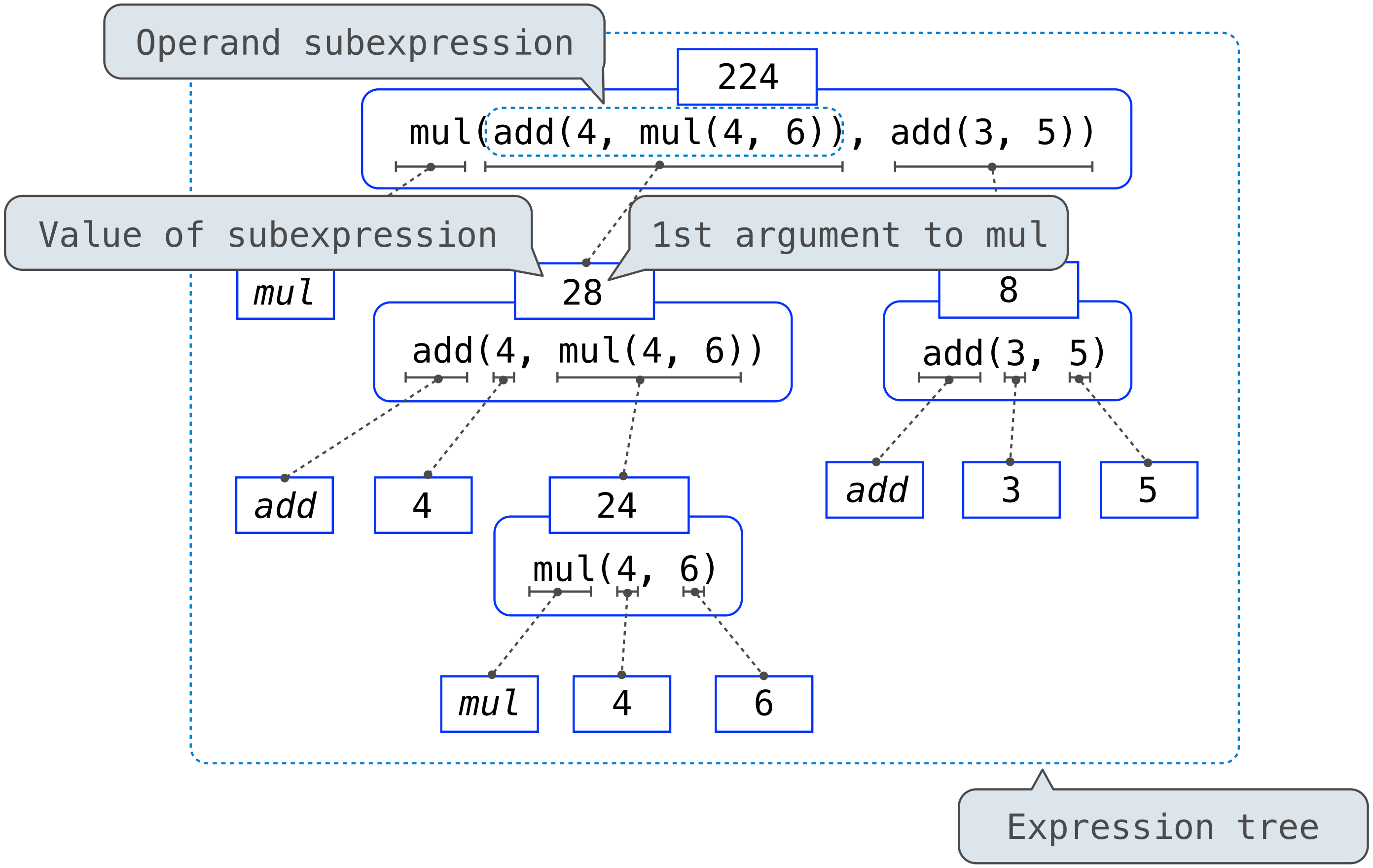

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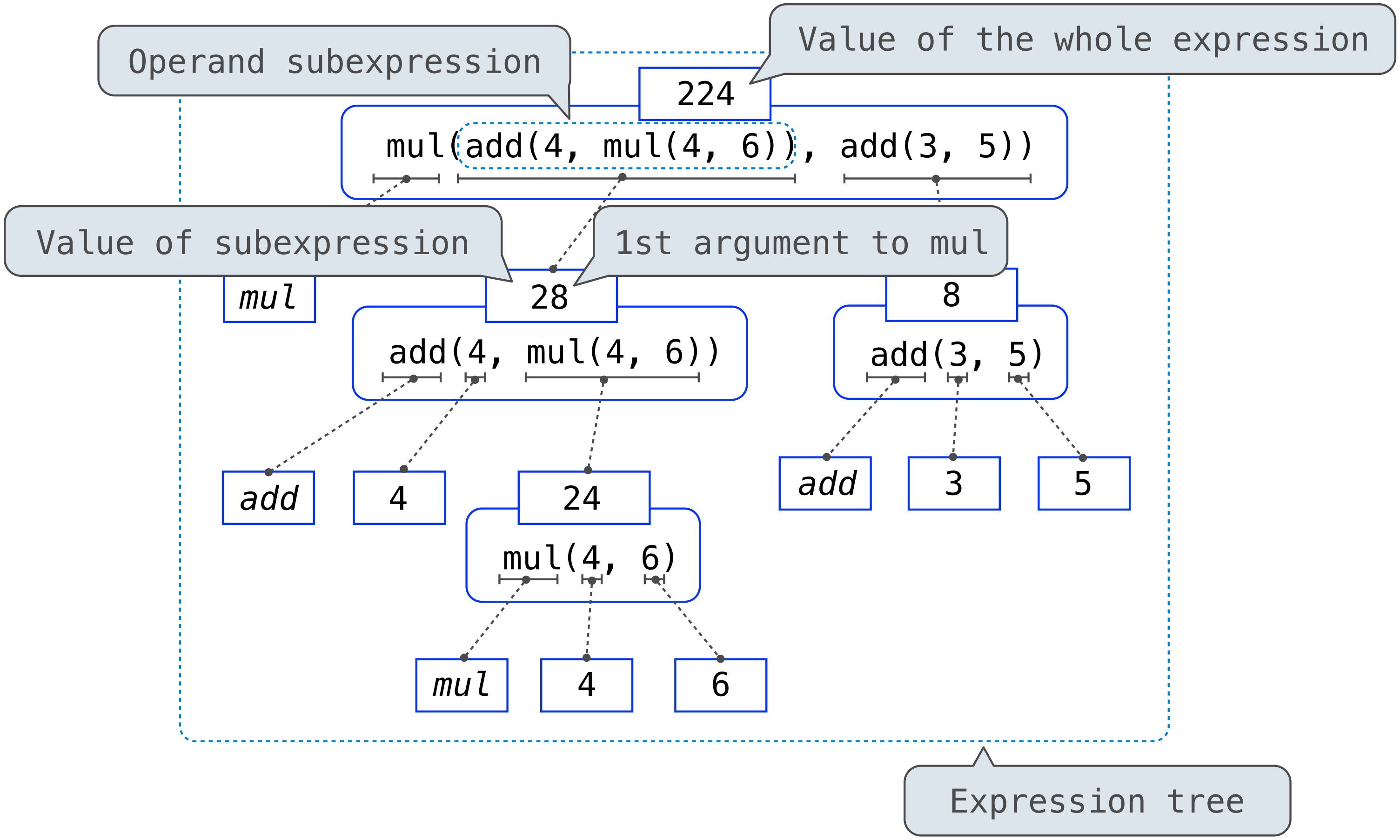

Functions, Values, Objects, Interpreters, and Data

(Demo)