61A Lecture 26

Monday, October 31

Programming Languages

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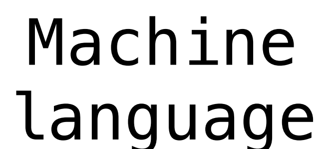

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In computer science, languages can be *implemented*:

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- The *semantics* and *syntax* of a language must be specified precisely in order to allow for an interpreter

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Prefix notation expression language for basic arithmetic

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- The {div,/} operator returns the real-valued quotient of a dividend and divisor (i.e., a numerator and denominator)

Expression Trees

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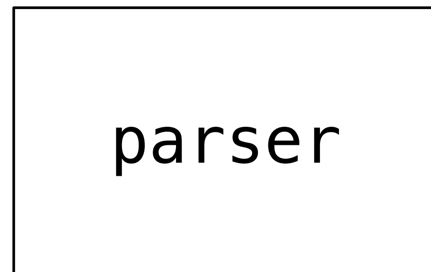

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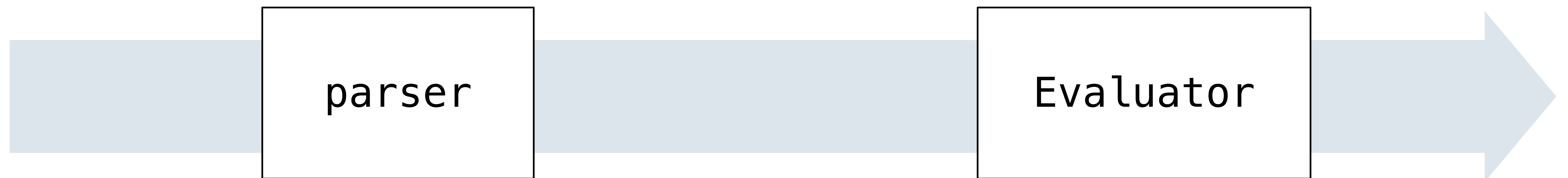

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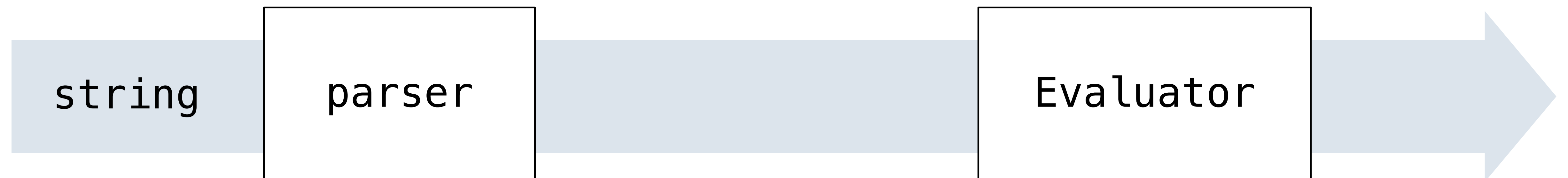

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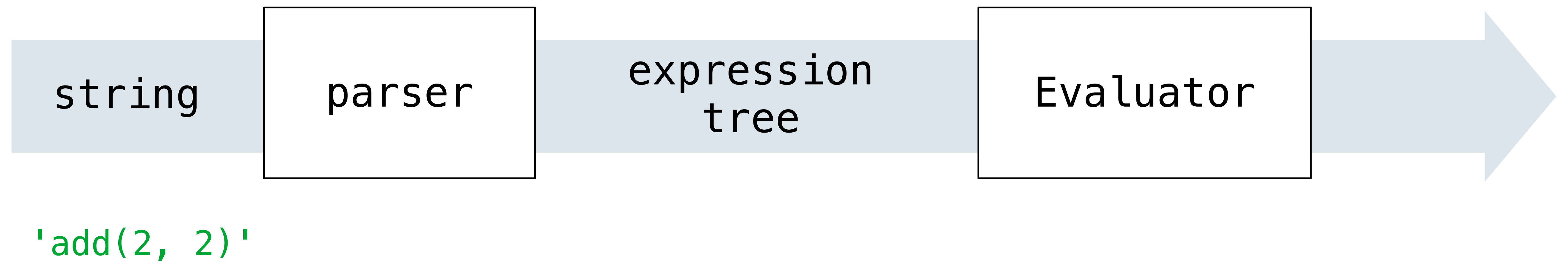

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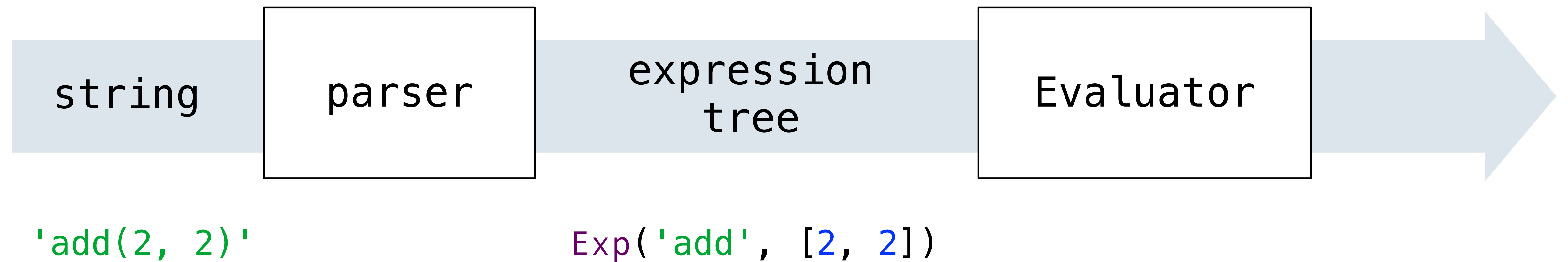

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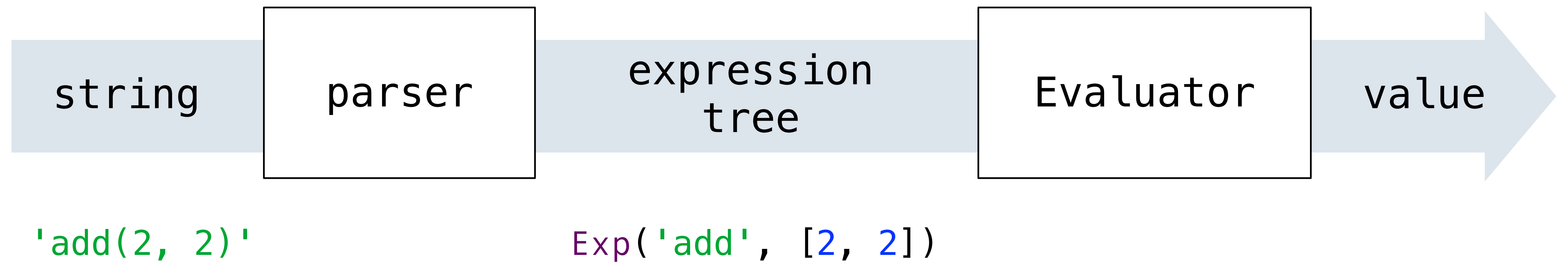

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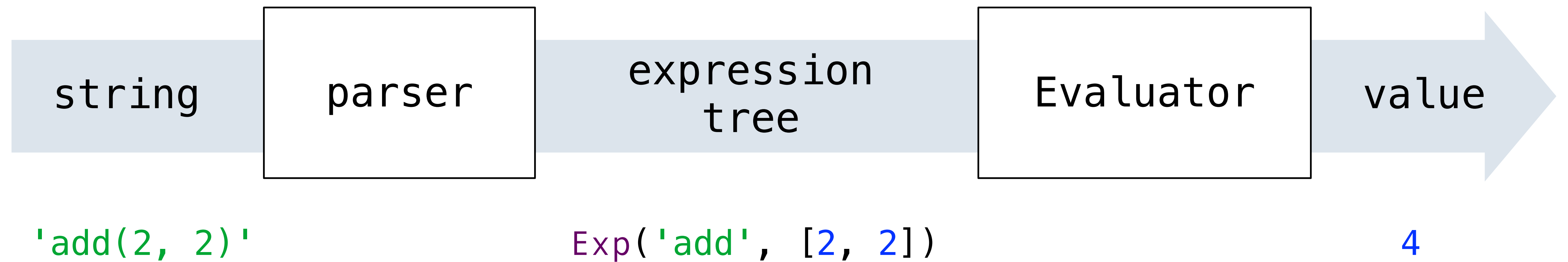

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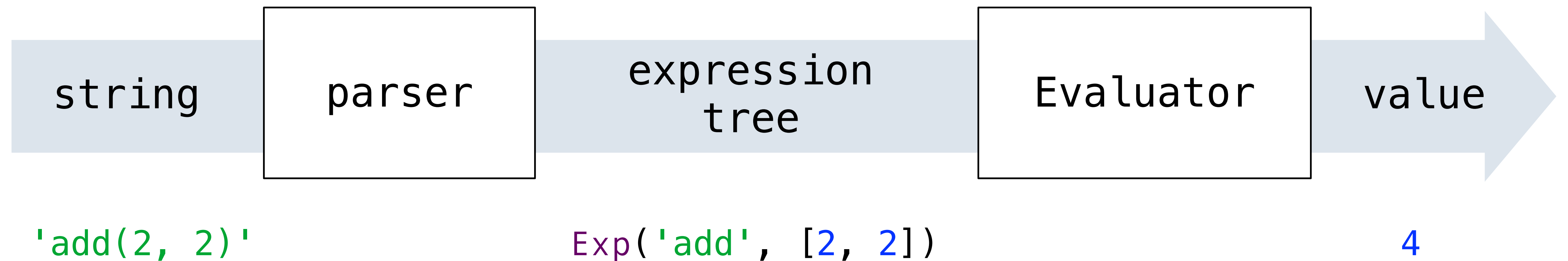

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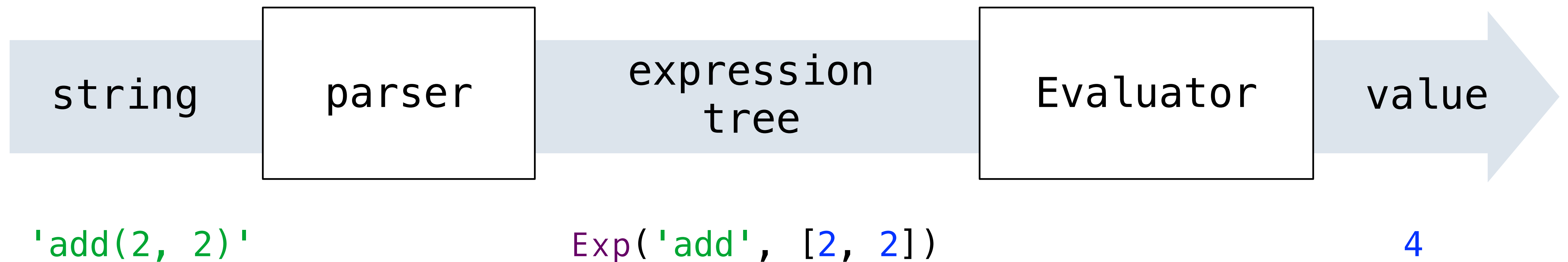

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```
class Exp(object):
    """A call expression in Calculator."""
    def __init__(self, operator, operands):
        self.operator = operator
        self.operands = operands
```

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        if len(args) != 2:
            raise TypeError(operator + ' requires exactly 2 arguments')
```

Raising Application Errors

The sub and div operators have restrictions on argument number

Raising exceptions in *apply* can identify such issues

```
def calc_apply(operator, args):
    """Apply the named operator to a list of args."""
    ...
    if operator in ('sub', '-'):
        if len(args) == 0:
            raise TypeError(operator + ' requires at least 1 argument')
        ...
    ...
    if operator in ('div', '/'):
        if len(args) != 2:
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```

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            expression_tree = calc_parse(input('calc> '))
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Demo