

61A Lecture 25

Announcements

Pairs Review

Pairs and Lists

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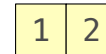
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(cons 1 2)



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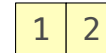
1	2
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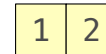


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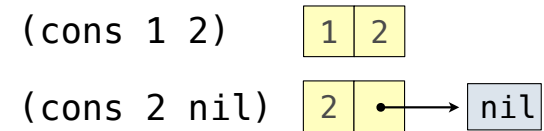
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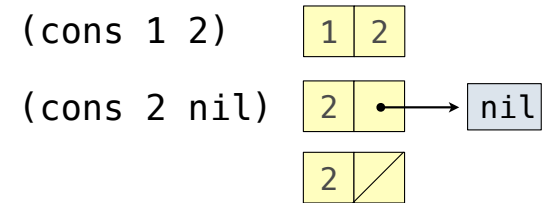
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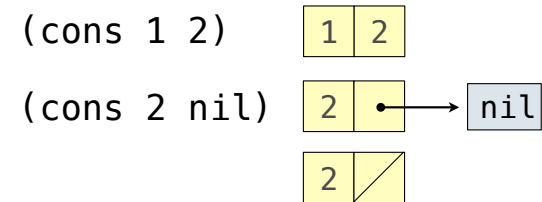
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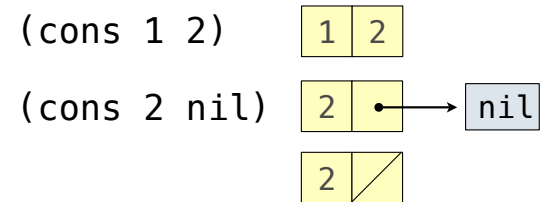
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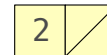
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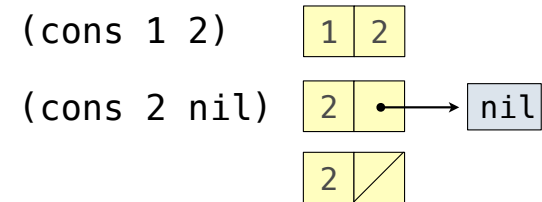
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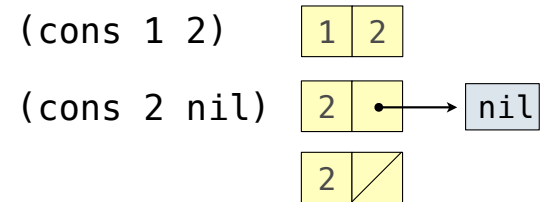
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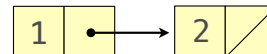
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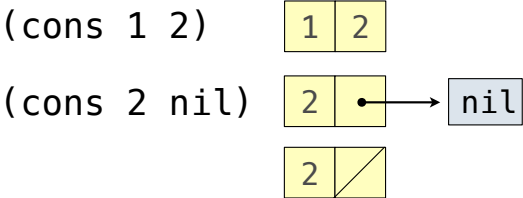
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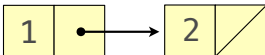
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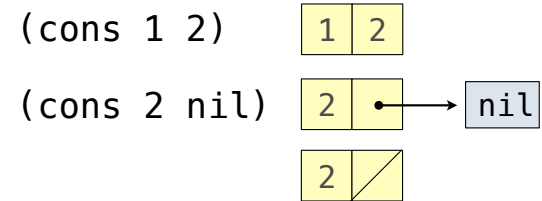
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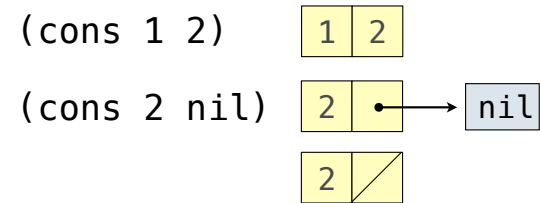
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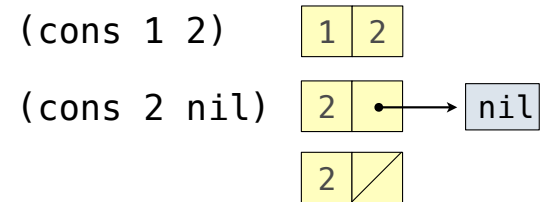
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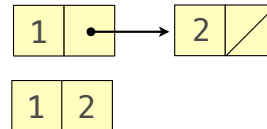
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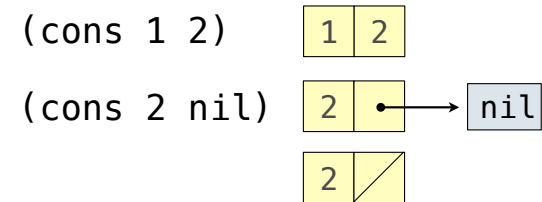
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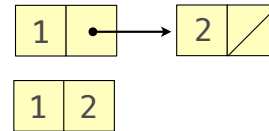
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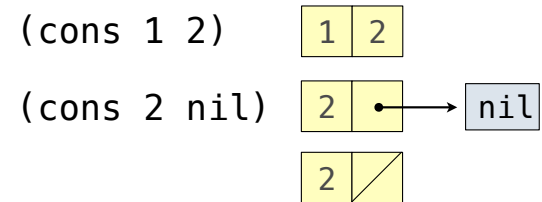
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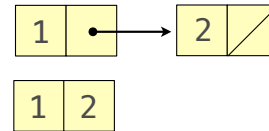
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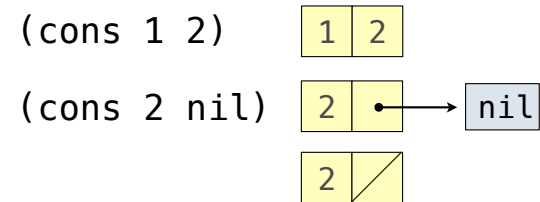
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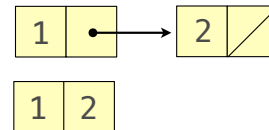
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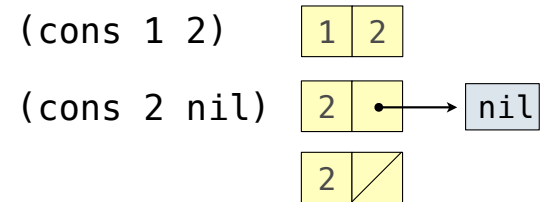


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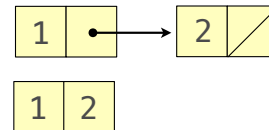
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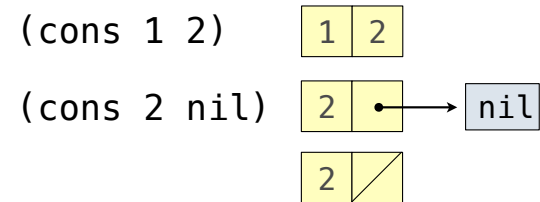


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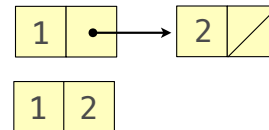
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> x
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1
```

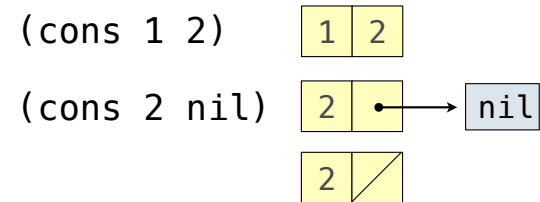


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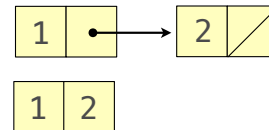
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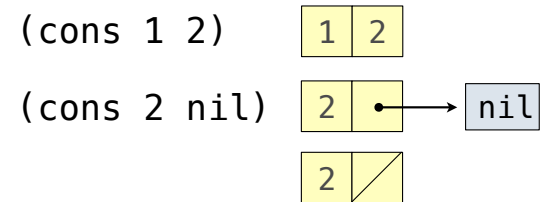


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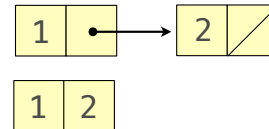
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```

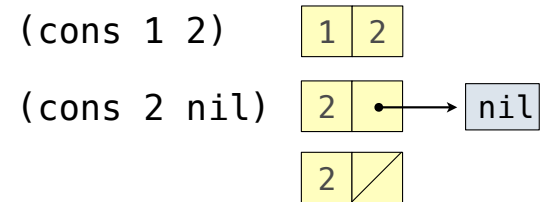


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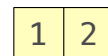
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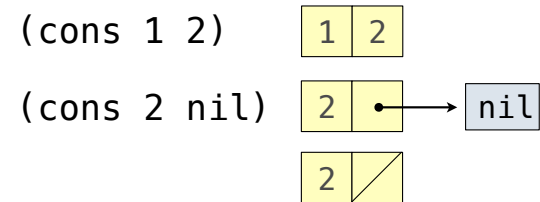


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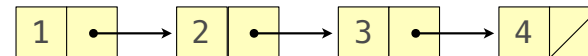
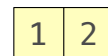
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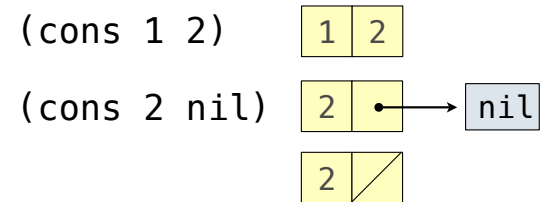


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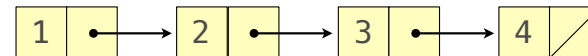
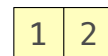
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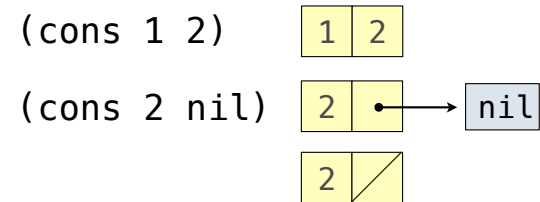


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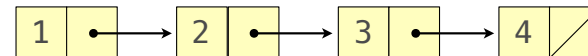
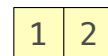
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(Demo)

Exceptions

Today's Topic: Handling Errors

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Sometimes, computer programs behave in non-standard ways

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Grace Hopper's Notebook, 1947, Moth found in a Mark II Computer

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Python raises an exception whenever an error occurs

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Exceptions can be handled by the program, preventing the interpreter from halting

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Unhandled exceptions will cause Python to halt execution and print a stack trace

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(Exception handling tends to be slow.)

Raising Exceptions

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(Demo)

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Example: Reduce

Reducing a Sequence to a Value

Reducing a Sequence to a Value

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    """Combine elements of s pairwise using f, starting with initial.
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E.g., `reduce(mul, [2, 4, 8], 1)` is equivalent to `mul(mul(mul(1, 2), 4), 8)`.

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>>> reduce(mul, [2, 4, 8], 1)  
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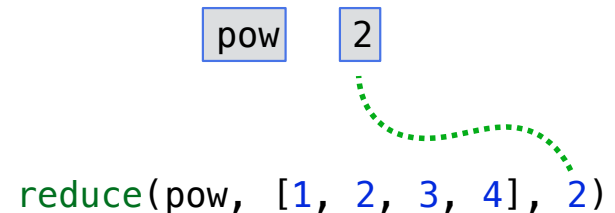
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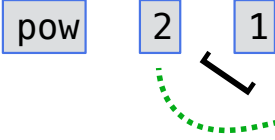

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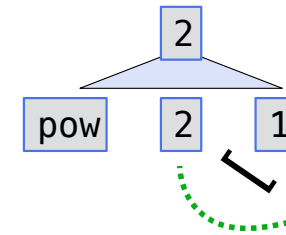
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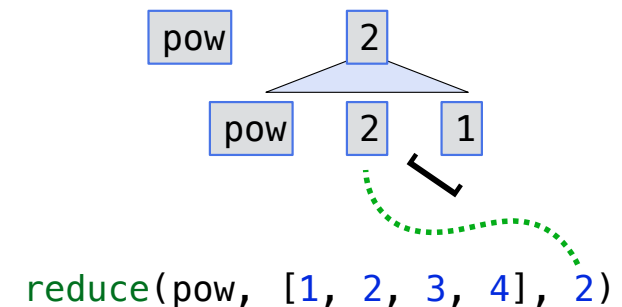
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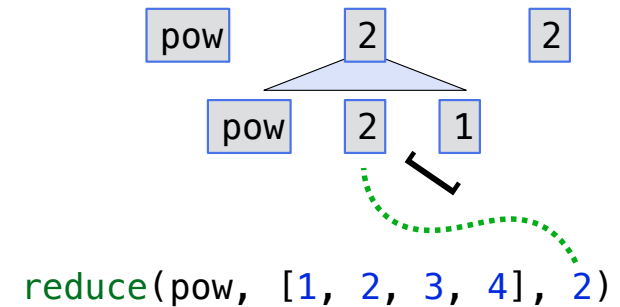
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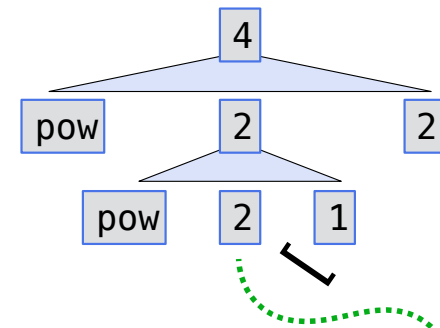
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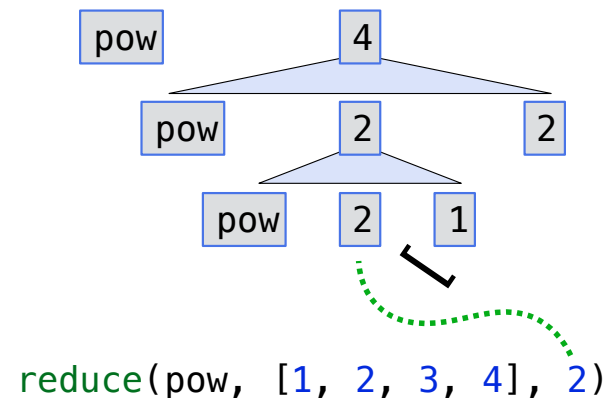
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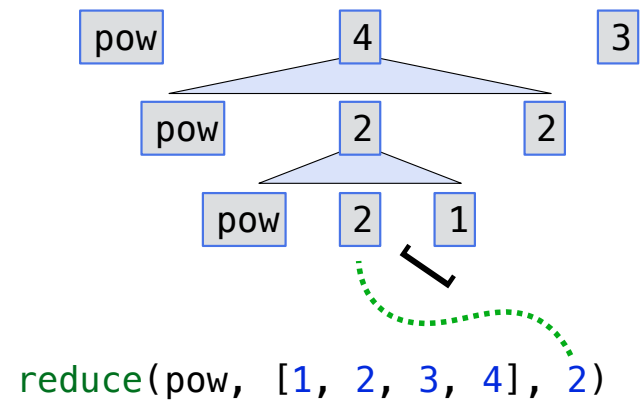
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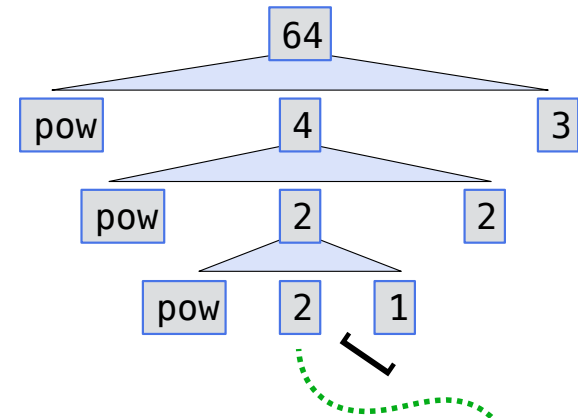
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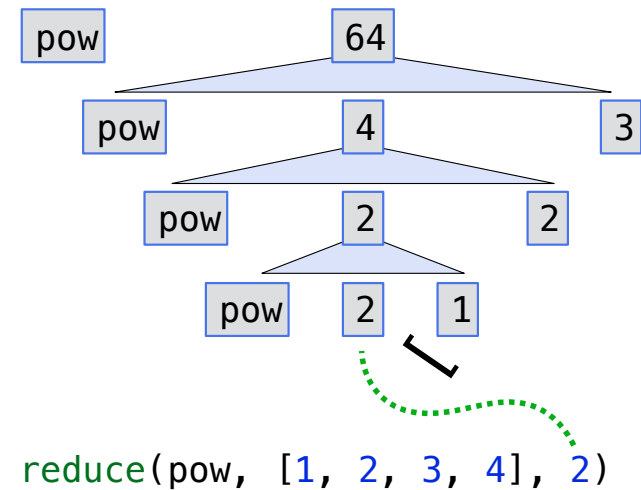
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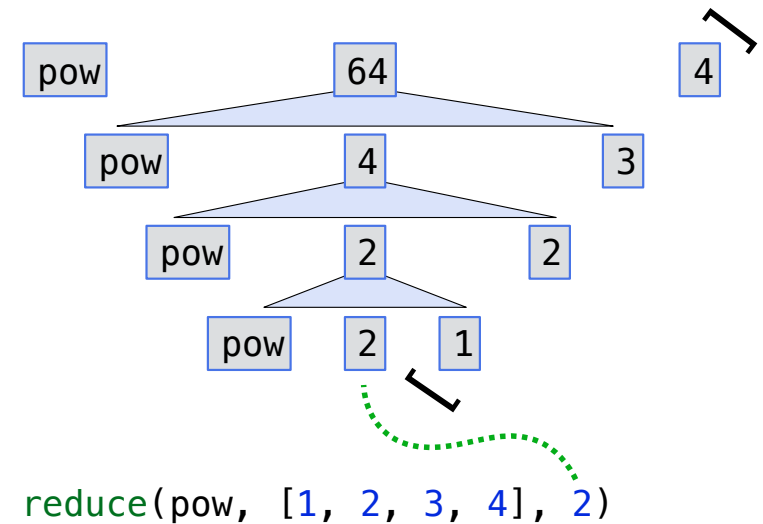
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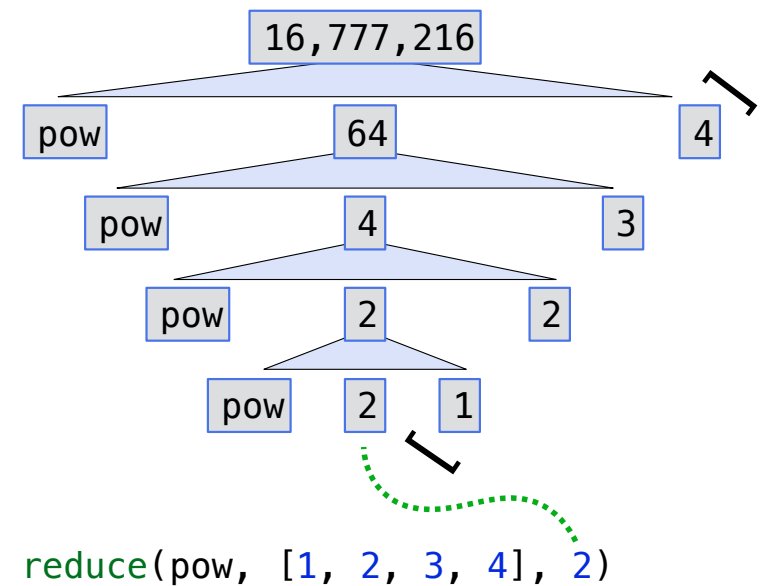
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`initial` is ...
a value that can be the first argument



Reducing a Sequence to a Value

```
def reduce(f, s, initial):  
    """Combine elements of s pairwise using f, starting with initial.
```

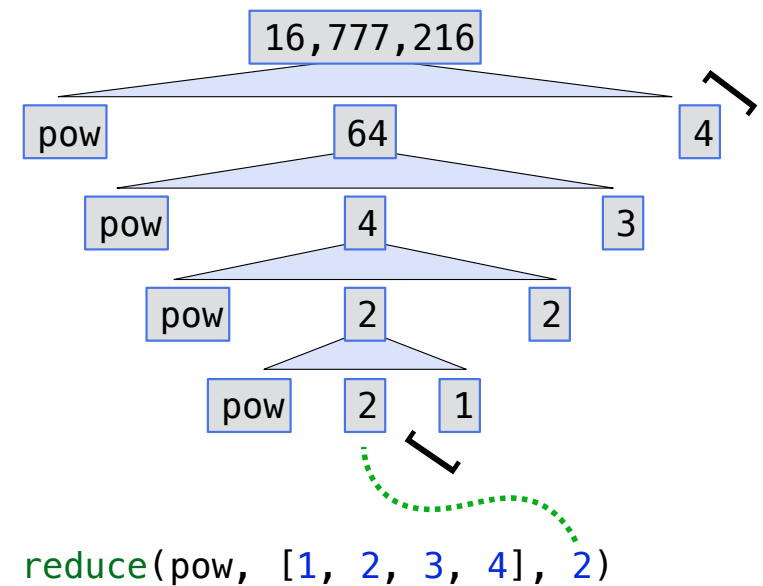
E.g., `reduce(mul, [2, 4, 8], 1)` is equivalent to `mul(mul(mul(1, 2), 4), 8)`.

```
>>> reduce(mul, [2, 4, 8], 1)  
64  
.....
```

`f` is ...
a two-argument function

`s` is ...
a sequence of values that can be the second argument

`initial` is ...
a value that can be the first argument



(Demo)

Sierpinski's Triangle

(Demo)