Announcements
Linked Lists
A linked list is either empty or a first value and the rest of the linked list.

Link(3, Link(4, Link(5, Link.empty)))

A linked list is a pair.
The first (zeroth) element is an attribute value.
The rest of the elements are stored in a linked list.

A class attribute represents an empty linked list.
Linked List Structure

A linked list is either empty or a first value and the rest of the linked list.

\[
\text{Link(3, Link(4, Link(5, Link.empty)))}
\]
Linked List Class

Linked list class: attributes are passed to __init__

class Link:

```python
empty = ()
```

```python
def __init__(self, first, rest=empty):
    assert rest is Link.empty or isinstance(rest, Link)
    self.first = first
    self.rest = rest
```

help(isinstance): Return whether an object is an instance of a class or of a subclass thereof.

```
Link(3, Link(4, Link(5)))
```

(Demo)
Sequence Operations
Linked List Class

Linked lists are sequences

class Link:
    empty = ()

def __init__(self, first, rest=empty):
    assert ...
    self.first = first
    self.rest = rest

def __getitem__(self, i):
    if i == 0:
        return self.first
    else:
        return self.rest[i-1]

def __len__(self):
    return 1 + len(self.rest)

More special method names:
__getitem__ Element selection []
__len__ Built-in len function

Methods can be recursive too!

(Demo)
Linked List Processing

[<map exp> for <name> in <iter exp> if <filter exp>]

(Demo)