

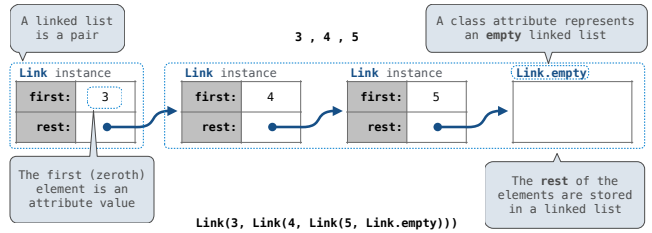
61A Lecture 17

Announcements

Linked Lists

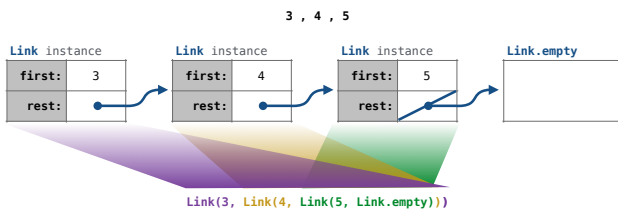
Linked List Structure

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



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Linked List Class

Linked list class: attributes are passed to `__init__`

```
class Link:
    empty = ()
    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, Link.empty)))
```

(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

Calls this method

This element selection syntax

Recursive call to `__len__`

Methods can be recursive too!

(Demo)

Linked List Processing

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

(Demo)