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• Homework 3 due Tuesday 10/1 @ 11:59pm
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• Optional Hog Contest due Thursday 10/3 @ 11:59pm
Sequences
The Sequence Abstraction
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red, orange, yellow, green, blue, indigo, violet.
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**Length.** A sequence has a finite length.

**Element selection.** A sequence has an element corresponding to any non-negative integer index less than its length, starting at 0 for the first element.
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0, 1, 2, 3, 4, 5, 6.

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There is built-in syntax associated with this behavior, or we can use functions.

A tuple is a kind of built-in sequence (demo)
Box-and-Pointer Notation
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1 \text{pair} = (1, 2)
2 \text{pairs} = ((1, 2), (3, 4))
Box-and-Pointer Notation

Examples:

1. pair = (1, 2)
2. pairs = [(1, 2), (3, 4)]


1. pairs = [(1, 2), (3, 4)]
2. first, second = pairs
The Closure Property of Data Types
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• The result of combination can itself be combined using the same method.
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• Hierarchical structures are made up of parts, which themselves are made up of parts, and so on.
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• Hierarchical structures are made up of parts, which themselves are made up of parts, and so on.

Tuples can contain tuples as elements
Recursive Lists
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Constructor:

```python
def rlist(first, rest):
    """Return a recursive list from its first element and the rest."""
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def rlist(first, rest):
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Behavior condition(s):
- If a recursive list s is constructed from a first element f and a recursive list r, then
  - first(s) returns f, and
  - rest(s) returns r, which is a recursive list.
Implementing Recursive Lists with Pairs

We can implement recursive lists as pairs. We'll use two-element tuples to encode pairs.
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(1, 2, 3, 4)
Sequence Abstraction Implementation
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Implementing the Sequence Abstraction

```python
def len_rlist(s):
    """Return the length of recursive list s."""
    length = 0
    while s != empty_rlist:
        s, length = rest(s), length + 1
    return length
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def getitem_rlist(s, i):
    """Return the element at index i of recursive list s."""
    while i > 0:
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Recursive implementations

(Demo)