CSc 110, Autumn 2016

Lecture 32: Critters

Adapted from slides by Marty Stepp and Stuart Reges
CSc 110 Critters

- Ant
- Bird
- Hippo
- Vulture
- WildCat (creative)

behavior:
- eat eating food
- fight animal fighting
- get_color color to display
- get_move movement
- __str__ letter to display
A Critter subclass

class name(Critter):

class Critter:
def eat()    # returns True or False
def fight(opponent)    # ROAR, POUNCE, SCRATCH
def get_color()    # returns a hex string
def get_move()    # returns NORTH, SOUTH, EAST, WEST, CENTER
def __str__()
How the simulator works

• "Go" → loop:
  • move each animal (get_move)
  • if they collide, fight
  • if they find food, eat

• Simulator is in control!
  • get_move is one move at a time
    • (no loops)
  • Keep state (fields)
    • to remember future moves
Development Strategy

• Simulator helps you debug
  • smaller width/height
  • fewer animals
  • "Tick" instead of "Go"

• Write your own main
  • call your animal's methods and print what they return
Critter exercise: **Cougar**

- Write a critter class **Cougar**:

<table>
<thead>
<tr>
<th>Method</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>__init__</code></td>
<td></td>
</tr>
<tr>
<td><code>eat</code></td>
<td>Always eats.</td>
</tr>
<tr>
<td><code>fight</code></td>
<td>Always pounces.</td>
</tr>
<tr>
<td><code>get_color</code></td>
<td>Blue if the Cougar has never fought; red if he has.</td>
</tr>
<tr>
<td><code>get_move</code></td>
<td>Walks west until he finds food; then walks east until he finds food; then goes west and repeats.</td>
</tr>
<tr>
<td><code>__str__</code></td>
<td>&quot;C&quot;</td>
</tr>
</tbody>
</table>
Ideas for state

• You must not only have the right state, but update that state properly when relevant actions occur.

• Counting is helpful:
  • How many total moves has this animal made?
  • How many times has it eaten? Fought?

• Remembering recent actions in fields is helpful:
  • Which direction did the animal move last?
    • How many times has it moved that way?
  • Did the animal eat the last time it was asked?
  • How many steps has the animal taken since last eating?
  • How many fights has the animal been in since last eating?
Critter exercise: Anteater

- Write a critter class **Cougar**:

<table>
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</tr>
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<tbody>
<tr>
<td><code>__init__</code></td>
<td></td>
</tr>
<tr>
<td><code>eat</code></td>
<td>Eats 3 pieces of food and then stops</td>
</tr>
<tr>
<td><code>fight</code></td>
<td>randomly chooses between pouncing and roaring</td>
</tr>
<tr>
<td><code>get_color</code></td>
<td>pink if hungry and red if full</td>
</tr>
<tr>
<td><code>get_move</code></td>
<td>walks up two and then down two</td>
</tr>
<tr>
<td><code>__str__</code></td>
<td>&quot;a&quot; if hungry &quot;A&quot; otherwise</td>
</tr>
</tbody>
</table>