for Loop and Lists

2-8-2009
Opening Discussion

- Do you have any questions about the quiz?
- Minute Essay comments
  - Why does it seem so logical and easy in class, but not on your own?
  - IcP in weeks you aren't called on.
  - Non-obvious uses of loops.
  - Ideas:
    - People avoid alligator
    - Alligator eats people
Objectives for the Week

- The first objective is to be able to repeat code without doing cut and paste.
- We want to use this to have the people walk toward the closest house.
- Then we want to make it so each house can only hold one person.
Repeating Code

• So far, if I have asked you to do something several times you have just copied the code.
• This is inefficient and inflexible. Can't do it a variable number of times.
• Let's consider a new method in city:
  – void addBuildings(int howMany)
• Copy and paste can't do this.
• The solution is a construct called a loop.
The for Loop

• The first loop we will learn about is the for loop. These are the most commonly used loops in Java and can do anything you want.
  - for(init; condition; iterator) {...}
• We will start off with just counting.
  - for(int i=0; i<number; i++) {...}
• The variable doesn't have to be i.
• The statement i++ is shorthand for i=i+1.
• Now let's add the buildings.
Lists

- Right now one variable refers to one object. We want to be able to deal with collections of objects.
- The Greenfoot API has methods in World that tell us about Actors. These all return lists. Let's look at them.
- We can also look at List in the full API. The main methods we need now are get(int index) and size().
- List indexes start at zero.
Generics

- The List class is a generic class. Because of this, we tell it what type it works with.
- The syntax for this is to put the type the list will hold inside of angle braces after the word List.
- In our case we want a list of houses.
  - List<House>
House Hunting

- Let's work on a method in our person called findNearestHouse().
- First, we should see if we can figure out how to run through all the buildings.
- Once we can do that we need to figure out how to determine which one is closest.
Minute Essay

- What questions do you have about the things that we covered today? How comfortable do you feel working in Greenfoot?