for Loop and Lists

2/9/2009
Opening Discussion

• Do you have any questions about the quiz?
• Practice with the interclass problems.
• Minute Essay comments
  – Making actors chase one another.
  – Combat between actors.
  – Troubles with coding on your own.
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.
Type Casts

- The `get()` method of `List` returns an `Object`. We need an `Actor/Person`.
- Java has a way to convert objects of one type to another. You should only do this when you know the object is actually of the type you are casting to.
- The syntax is to put the type you want in parentheses in front of the expression you are casting to.
  - `(Person)list.get(i);`
House Hunting

- Let's work on a method in our person called `moveToNearestHouse()`.
- 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?