

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?