Interacting with Objects

8/31/2009

Opening Discussion

- Have you come up with any questions about the class since last time?

- Minute essay responses:
  - I fully understand that people will miss some classes. Don't come to class if you are sick.
  - My favorite NBA team is the Spurs.
  - Is there a lot of memorization?
  - You should be able to do everything you need on lab computers or your own computer.
  - OSX should work just fine.

Greenfoot

- Let's run Greenfoot and open up the PSPGWombats scenario.

- Greenfoot environment has several parts to it.

  – Shows a 2-D graphical display in the main area.

  – Elements that make things active at at the bottom.

  – List of different classes are on the right.

Classes and Objects

- Java is a class-based object-oriented programming languages. We write classes and those are the blueprints for making objects.

- Greenfoot groups different classes: World, Actor, Others.

- We can tell Greenfoot to make a new Actor object from a class either with a right-click or holding shift.

Methods

- Classes have methods in them and these methods can be called on the objects of that class.

- Right click on "wombatWorld" at the top to call a method on the WombatWorld object. Right click on one of the objects to call a method on it.

- Methods can cause things to happen or give us back information.

Parameters and Return Types

- Some methods need extra information. This is passed in through parameters.

    - The setDirection method in Wombat needs to be told a direction.

- Some methods give you back information.

    - The getLeavesEaten method in Wombat tells you how many leaves have been eaten.

- The "signature" of a method begins with the return type then has the method name and an argument list in parentheses.

Types

- If you go through all the options on the Wombat when you right click you will see a number of different types.

  - int: for numbers that don't have fractions.

  - boolean: either true of false.

  - String: any text you want.

  - GreenfootImage and World: types specific to Greenfoot.

- Other types include double and char.

- Classes define types.

Act and Run

- At the bottom of the window is an area that has a few buttons. All the actors in Greenfoot have a method called act.

- Clicking the Act button calls that method on all the actors.

- Clicking Run will repeatedly call the act method.

Member Data

- Objects can hold information as well. These are called members.

- You can look at what is stored by an object by selecting inspect from the right-click menu.

- Arrows are drawn when members store other objects. In Java object types are often called reference types.

Solving a Problem

- I want to make the Wombat eat all the leaves on the screen.

- What series of instructions would you give the Wombat to make this happen?

Generality

- Is the series of instructions you came up with general? If we moved the leaves, would it still work?

- Generality is something that we typically strive for in the code that we write. It often shortens how much total code we need to create or how often we have to edit things.

Optimality

- Was your method of eating all the leaves optimal? Was there a shorter set of instructions that would have accomplished the same task?

- Optimality is a secondary goal for most code.

- Programs can also be used to help us determine if solutions are optimal.

Minute Essay

- Do you have any questions about the topics we discussed today?