Class Hierarchies

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Opening Discussion

- Let's look at the interclass problem.
- Any questions about the project? Your ideas are due next Wednesday and I hope to get comments back to you on Friday.

Bank Example

- I want to spend just a bit more time putting in the menu options we were working on with our bank example.

Inheritance

- Inheritance is a feature that nearly all class-based, object-oriented programming languages have.
- Inheritance provides us with two benefits.
  - Code reuse
  - Subtyping
- Only use inheritance when modeling the is-a relationship.

Code Reuse

- The first benefit of inheritance is that it provides code reuse. The subtype effectively gets all the code from the supertype copied into it without actually duplicating the code.
- You can override methods from the supertype if you don't like how they do things.
- This turns out to be the less significant benefit of inheritance.

Subtyping

- The second feature provided by inheritance is subtyping. This basically is a restatement of the is-a relationship.
- By definition, a subtype can be used anywhere in a program where a supertype is expected. We'll talk more about this next week.

Class Hierarchies

- Many classes related by inheritance produce a hierarchy.
- The most general types are at the top of the hierarchy while the more specific types are found further down.
- It is common to denote classes graphically using UML diagrams.
  - Classes are represented by rectangles
  - Inheritance is denoted by an arrow from the subtype to the supertype.

Inheritance Example

- Let's look now at an example of inheritance in code so that we can see not only how to use it, but also the syntax for it in Java.
- Note that Eclipse can help you put in your inheritance if you specify the supertype in the dialog when you create a class.
- All things inherit from Object.
- Using the super keyword.

Interfaces

- So far we have put all of our Java code in classes. Java has another construct called an interface that is very similar to a class, but is used just for inheritance.
- An interface can't have any code in it. You simply list methods, but don't give them bodies.
- The interface tells you what you can do with a type but it doesn't tell you anything about how you do it.
- There is no code reuse with interfaces because there is no actual code in interfaces.

Minute Essay

- Give an example of a class hierarchy.
- Interclass Problem – See what you can do on problem 13.2. At the least set up the classes and add in the proper methods.