Lecture 6: Classes

CS 51G
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Announcements

- Go over quiz.
- Discuss Exercise 5.9.1 & 5.9.2
- Lab due by 11 p.m. tonight

Defining Classes

- No language supplies all objects you can possibly need.
- Need mechanism to create new kinds of objects.
  - Classes!

Defining New Objects

- What is an object?
  - Consists of defs, vars, and methods
  - Methods provide operations that others can request
- Can define an object directly
  - http://www.cs.pomona.edu/classes/cs051G/demos/ClassyBasketballObject/ClassyBasketballObject.grace
- Can also define class to generate them:
  - http://www.cs.pomona.edu/classes/cs051G/demos/ClassyBasketball/ClassyBasketball.grace

Subtle Points

- Methods only executed when requested
- moveTo vs moveBy
  - Defined moveTo in terms of moveBy
  - “self” refers to the object executing the code so self.moveBy(5,7) means execute object’s own moveBy method

Object Expressions vs Classes

- Use object expression when only need one object.
- Use class when need more than one or need to pass in values.
- Either way, be sure to initialize variables before using them and do any other set up when program starts.

Object ⇒ Class

- def nm: Tp = object {...}
  replaced by
- class nm(...) → Tp {...}
- Formal parameters of class allow varying features (like location, size) of new object.

Methods

- If return a value to whoever invokes (e.g., contains) then → type of value returned.
- If just does stuff then return type is Done
- Class returns type of object created (see examples of basketball class)

Another Example

- DragAShirt
  - T-shirt class doesn't have to be in same file.
    - Just import it!
  - http://www.cs.pomona.edu/classes/cs051G/demos/Tshirt/DragAShirt.grace
  - http://www.cs.pomona.edu/classes/cs051G/demos/Tshirt/Tshirt.grace
- If time, add methods to Basketball class
  - setColor
  - returnToStart

Questions?