Lecture 12: Debugging & Object-Oriented Design

CS 51G

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Announcements

- Discuss Exercise 9.10.2

- Questions on BoxBall?

Audio

- To play audio in your program.
  - Find an audio file (in .wav format) on web.
  - Use audioUrl to load it into your program:
    - def bounce: Audio = audioUrl ("http://www.cs.pomona.edu/~kim/ CSC051GF16/demos/BouncingBasketball/hit.wav")
  - Send "play" message to play the sound.
    - bounce.play

Why Types?

- Types specify publicly available features of objects.

- Many items can have same types.

- See more flexible laundry:
  - http://www.cs.pomona.edu/classes/cs051G/demos/ShirtsAndPants/

- Only change required in main program:
  - `var item: Graphic2D` *changed to*
    `var item: lt.Laundry`
  - Can write item.moveTo(x,y), item.contains(pt), ...

Debugging Tips

1. Plan ahead — think through big picture

2. Write & test program incrementally

   - Add small parts and then test — don't wait!

3. Localize the problem — where did it happen?

   - http://www.cs.pomona.edu/classes/cs051G/demos/BadKnitting/BadKnitting.grace

4. Use print to see what is going on.

   - If use several, label output

Object-Oriented Design

Object-Oriented Design

- Object is an abstraction
  - consisting of features/properties and behavior (what it can do), often modeling real world.

- When describe scenario:
  - Objects (or data) correspond to nouns
  - Methods to verbs

- How to model a ball
  - What are features/properties?
  - What are behaviors?

Which do we care about for this program?

OO Design

- Properties typically modeled by defs and vars

- Behaviors by methods

- Class constructions

  - Why parameters?

  - Factory for generating objects

- Use existing objects/classes to compose new ones!

OO Design of Frogger

- What objects are there?
  - Frog
  - Highway
  - Vehicles

Frog

- Properties?

- Behaviors?

- Construction?

- When/how will methods/construction be called?

Vehicle

- Properties?

- Behaviors?

- Construction?

- When/how will methods/construction be called?

LaneFiller

- Properties?

- Behaviors?

- Construction?

- When/how will methods/construction be called?