

Lecture 13: Object-Oriented Design & GUI Components



CS 51G
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Announcements

- Discuss Frogger

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?

Main Program/Frogger

- Properties?
- Behaviors?
- Construction?

Let's Do GUI!

GUI Items

- Components so programmer can interact with system.
 - Text fields
 - Buttons
 - Menus
 - etc.
- Can add to screen before or after canvas

First Examples

- Input from a text field
 - <http://www.cs.pomona.edu/classes/cs051G/demos/TextController/TextController.grace>
 - Create with class `textFieldLabeled(startString)`
 - It is NOT on canvas, so no canvas parameter!
 - Access value by sending the message “text”
 - `var curValue: String := input.text`

Buttons & Events

- Add a button:

- <http://www.cs.pomona.edu/classes/cs051G/demos/TextButtonController/TextButtonController.grace>

- Create with class `buttonLabeled(startString)`

- If button pressed, mouse event is generated

- Associate action to a button by sending an `onMousePressed` message to button with action to be performed:

```
clearButton.onMousePressDo {mevt: MouseEvent ->
    canvas.clear
}
```

- `mevt` is the event generated. Action after arrow is performed after each button press

Questions?