Lecture 2:
Fundamentals & Graphics

CS 51G

Spring 2018

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Course web page: http://www.cs.pomona.edu/classes/cs051G

Announcements

- Accept invitation from Piazza

  - How we will communicate outside of class

- Lab (*required!*) in Edmunds 105

  - starts promptly at 1:15.

  - Normally start with quiz — not today

  - If well prepared should finish by 4 p.m.

- Let me know about typos in text, notes, etc.

Why is language named Grace?

- Named after Commander Grace Hopper, USN.

- One of earliest programming language designers.

- Other things named after her:

  - CS conference for women, US Navy destroyer

- Hope language design will teach graceful style of programming!

Review

- Main program typically an object expression with methods to respond to mouse actions.

- Object expression consists of object keyword &
  - definitions
  - variable declarations
  - method definitions
  - initialization code
  - all within "curly braces"
  - If main program then has "inherit graphicApplicationSize(w @ h)"

Methods

- Consist of method header followed by a list of statements surrounded by curly braces.

- Special methods to respond to mouse actions:
  - onMousePress, onMouseRelease, onMouseDrag, ...

Statements

- Object constructions:
  - object expressions: object {...}
  - class constructions:
    - E.g., framedRectAt(x @ y) size (w @ h) on (canvas)

- Method invocations: canvas.clear

- Definitions: def x: Number = 17

- Assignments: var box := framedRectAt(...)
  - box := filledRectAt(...)

Parameters

```
method onMousePress (pt: Point) → Done {
    print (pt)
}
```

- When mouse pressed and body of method is executed, pt associated with location of mouse.

- Can use any name you like for parameter, but type must always be Point.

  - onMousePress (spot: Point) ...

Naming Conventions

- All names should suggest what they stand for
  - E.g., box, hoop, average, not b, h, a!

- Type names always start with capital letters:
  - Point, Number, Line, Graphic2D, Done

- Definitions, methods, variables, and classes always start with lower case letters:
  - onMousePress, box, count, framedRectAt()size()on()

CamelCase

- Identifiers may not have spaces (but may have _ and single quote: ').

- Descriptive names often include several words, smooshed together with caps where glued
  - onMousePress, framedRectAt()size()on, boxStart
  - Graphic2D, AnimatedObject

- Called camel case (because of humps)

Programming Examples

- Design a program that draws a box wherever the mouse is clicked.
  http://www.cs.pomona.edu/classes/cs051G/demos/ImprovedMakeBox/ImprovedMakeBox.grace

- Design a program that draws lines from where the mouse is pressed to the current location of the mouse.
  http://www.cs.pomona.edu/classes/cs051G/demos/Spirograph/Spirograph.grace

Programming Examples

- Design a program that creates a scribble. That is, it draws line segments joined end to end as the mouse moves.
  http://www.cs.pomona.edu/classes/cs051G/demos/ScribbleNoColor/ScribbleNoColor.grace

  - Add random color using colorGen.randomColor?

- Design a program that draws crosshairs over the current mouse location.
  http://www.cs.pomona.edu/classes/cs051G/demos/CrossHairs/CrossHairs.grace

Questions?