CompSci 4
Chap 5 Sec 2
Oct 16, 2007

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Announcements

- Read Chapter 6 Tips and tech for next time
  - Randomness
- Assignment 5
  - Part 1 and 2, due next week
- Prof Rodger no office hours rest of this week
- Today - Lecture on Chap 5, Sec 2
  - Event-handlers with parameters
  - Classwork

Mouse Clicks

- Interactive programs – allow user to mouse click an object
  - Buttons in an interface
  - Targets in a game
  - Checklist of items on a form
- Will see how to pass information about a mouse clicked object to an event handler

Example

- People are trapped in a burning building
- Select which person will be rescued

Storyboard

- Three people are to be rescued
- Could write 3 different methods

Event: click on guy1

Responding Method:
Save guy on first floor

Event: click on girl2

Responding Method:
Save girl on second floor

Event: click on girl3

Responding Method:
Save girl on third floor

A Better Solution

- Write one event handler
- Send in information needed for action

firetruck.savePerson:

parameters: *whichFloor, whichPerson, howFar*
Do in order
point ladder at *whichFloor*
extend ladder *howFar* meters
whichPerson slides down ladder to fire truck
pull ladder back *howFar* meters

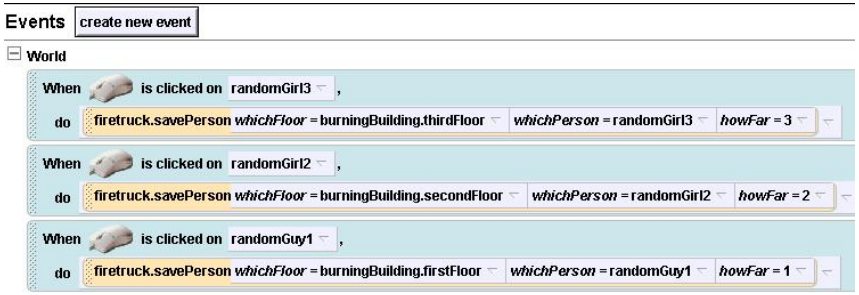
What type are the parameters?

Demo

- Demonstration of burning building and setting up events for *firetruck.savePerson*

Three Events

- The argument sent to parameters depends on which person is mouse clicked



- Note - we positioned fire truck so distance from floor X is X meters (to floor 3 is 3 meters)

Example 2 – put events in

- Zeus was a powerful god in Greek mythology. When Zeus was angry, he would shoot a thunderbolt out of the heavens to strike anyone who got in the way
- The user will choose the philosopher who will be the next target of Zeus' anger.

Storyboard

- Possible design – method with Object parameter named *who*, for object clicked

Event: an object is mouse-clicked

Event handler: *shootBolt*

Parameter: who – object clicked
Do in order
prepare to strike object that was clicked
thunder plays and lightning strikes object clicked
lightning is repositioned for next strike

– The actions in storyboard are complex
– Break actions into simpler steps using stepwise refinement

Event: an object is mouse-clicked
Event handler: *shootBolt*
Parameter: *who* – object clicked
Do in order
prepare to strike object that was clicked
thunder plays and lightning strikes object clicked
lightning is repositioned for next strike

prepareToShoot
Parameter: *target*
Do together
turn Zeus to face the *target*
make the lightning bolt visible

lightning and Thunder:
Parameter: *target*
Do together
play sound
call *specialEffects* method
- send *target*

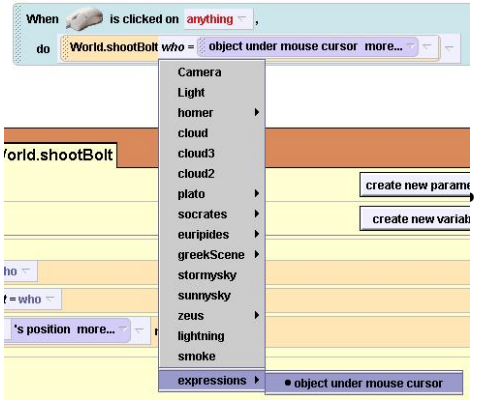
specialEffects:

parameter: *target*
Do in order
Do together
lightning bolt move to *target*
smoke move to *target*
Do together
set smoke to visible
set lightning to invisible
call smoke cycle – built-in method
set *target* color to black
move *target* up and down

A Driver

- shootBolt method - top level of our design
- It calls other methods and controls the overall action of the program – we call this a **driver**

One Link



- In the fire rescue example, we used three links – one for each person in the burning building.
- In this example, we use only one link by selecting "object under mouse cursor" as the argument.

Demo

- Test run of Zeus world – (this version doesn't have the if statements from Chap 6 added in)
- When parameters are used in interactive programming – especially important to test that all possible parameter values work as expected
  - What happens if you click on each philosopher, one at a time?
- Also try things that shouldn't work
  - What happens if you click on a column?
  - What happens if you click on a philosopher twice?
  - What happens if you click on Zeus?

Classwork today

- Create 2 worlds (or can combine them)
  - Problem 14, page 140
  - Problem 15, page 141 (can use any person)