CompSci 4
Chap 5 Sec 1 and 2
Oct 8, 2013

Prof. Susan Rodger

Announcements

- Read Chapter 6 Tips and Techniques for next class
- Reading quiz due next time
- New groups today
- Assignment 5 out
  - Part 1 due Tues. Oct 22 and Part 2 due Oct 24
- Today
  - Interactive programming, event handlers
  - Create billboards

Control of Flow

- Control of flow – how the sequence of actions in a program is controlled
  - What action happens first, second, third, ….
- In movie-style programs (Chaps 1-4) the sequence of actions is determined by the programmer
  - Creating a storyboard design
  - Writing program methods to carry out the designed sequence

Interactive Animations

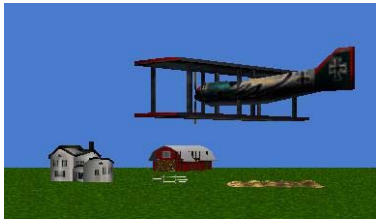
- In interactive programs, the sequence of actions is determined at runtime, when the user provides **input**
  - Clicks the mouse
  - Presses a key on the keyboard
  - Other sources of input are possible
- Interactive games
  - Each time the program runs, user input may cause a different sequence of actions

Event Handlers

- An **event** may
  - Trigger a response, or
  - Move objects into positions that create some condition (e.g. a collision) that triggers a response
- An **event handler** is a *method* that is called to carry out the response.
- When an event is linked to an event handler, a **behavior** is created.
- How does this effect your program?
  - Input from the user (**events**)
  - How objects respond to events **(event handler)**

Example 1

- Build an air show flight simulator. The pilot (user) uses the biplane controls to perform acrobatic stunts.



- Problem: How do we write program code to provide a guidance system that allows the user to be the pilot?

Solution

- Use keyboard input
  - "F" key to move the biplane forward
  - Spacebar to make the biplane do a barrel roll
  - Note: other keys could be chosen
- Write event handler methods that respond to each key press

- Storyboards (next slide) and DEMO
- NOTE Event storyboards are different!

Event Storyboards

- Since two keys are used, two events are possible – so two storyboard scenes

Event: Spacebar press

Response:
Do together
roll biplane a full revolution
play biplane engine sound

Event: F-key press

Response:
Do together
move biplane forward
play biplane engine sound

- Each storyboard outlines an event handler
  - Responds to a particular event

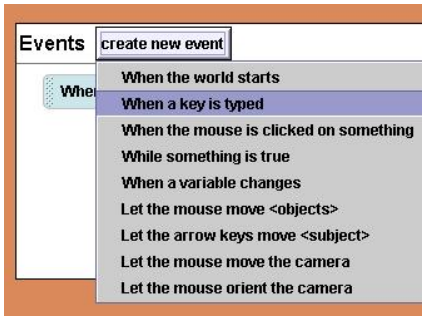
biplane.flyForward

- Do not modify the length of the sound
  - use "as is"
- Coordinate duration of *move* and *play sound*
  - Match duration of move to duration of sound

Events Editor - Linking

- Each event handler method must be linked to an event

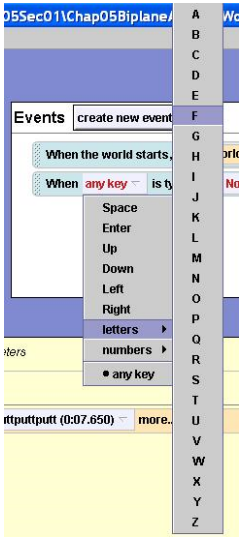
1) Select "create new event"
Then choose the type of event



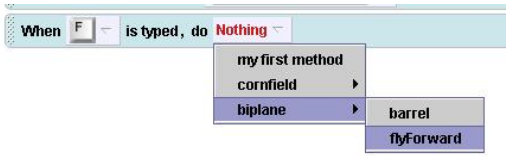
2) A template linking is created

Events Editor – Linking (cont)

3) Select type of key for event

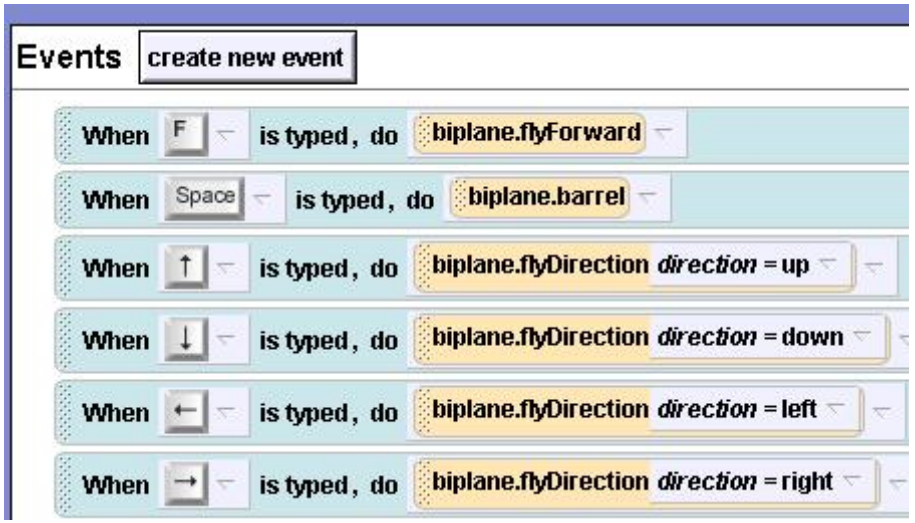


4) Select event handler method



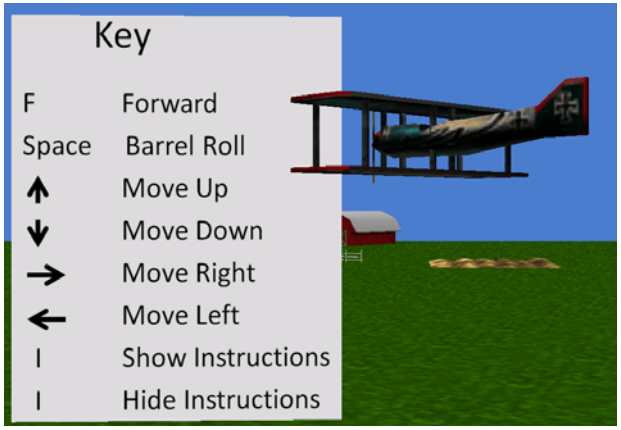
Final result:

More Functionality

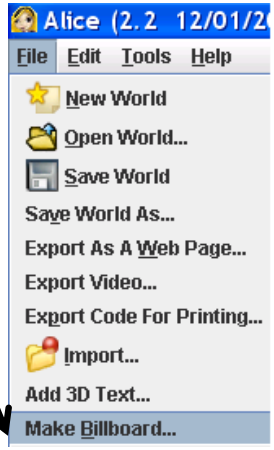


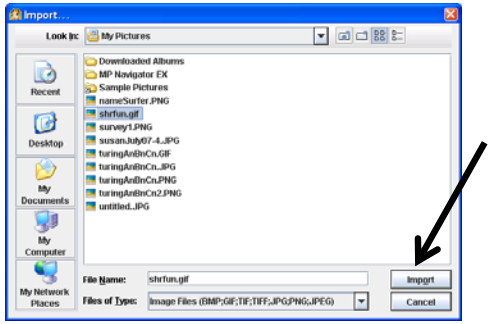
Add a Billboard with Instructions

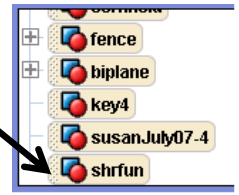
- Add an event "I" to make the instructions hide or show (create with paint, powerpoint or some tool and save as an image)



To drop in a Billboard







- "Make Billboard, import, picture appears in object tree

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 2

- Burning Building
- People are trapped in a burning building
- Select which person will be rescued
- See firetruck.savePerson

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

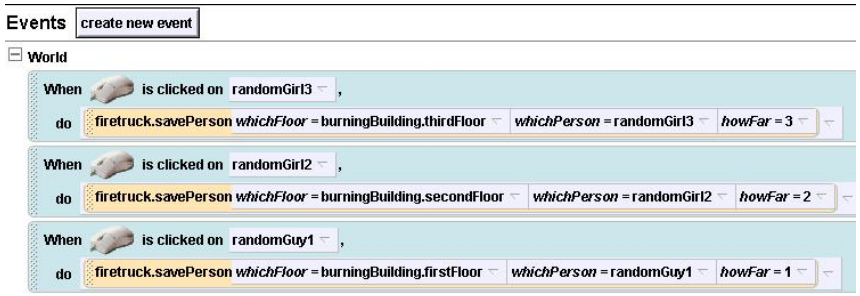
firetruck.savePerson:

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?

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)

Classwork today

- Create 2 worlds (or can combine them in one)
  - Penguins sliding down the hill into the pond.
  - Hockey hitting puck at different speeds(can use any person)
  - Include instructions in both…(make billboard)