CompSci 4
Chap 5 Sec 1
Oct 11, 2007

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Announcements

- Read Chapter 5 Sec 2 for next Tuesday
- New groups today
- Assignment 5 out
  - Part 1 and Part 2 Due Oct. 24
- Test 1 back today

- Today
  - Interactive programming

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

- In a video game where the user is guiding a spaceship, the sequence of actions …
  - Depends on what direction the user guides the ship
  - How fast the user presses the controls
- Each time the program runs, user input may cause a different sequence of actions
- Control of flow is "in the hands of the user"

You Already Saw Events

- Each time the user provides some sort of input, an event is generated

From Appendix

When spacebar pressed, Bee turns around

Event Handlers

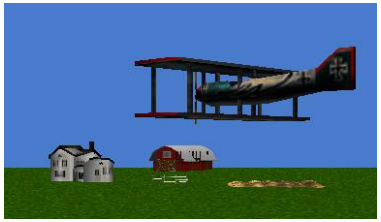
- An event may
  - Trigger a response, or
  - Move objects into positions that create some condition (e.g. a collision) that triggers a response
- An **event handler** is a *method* that is called to carry out the response.
- When an event is linked to an event handler, a **behavior** is created.

How does this effect your program?

- Our goal is to write interactive programs.
- The approach is the same as before, but the difference is now must be concerned with **behaviors**.
  - input from the user (**events**)
  - How objects respond to an event (**event handler methods**)

Example

- 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 building world

Storyboards

- Since two keys are used, two events are possible – so two storyboards are needed

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 and event handler
  - Responds to a particular event

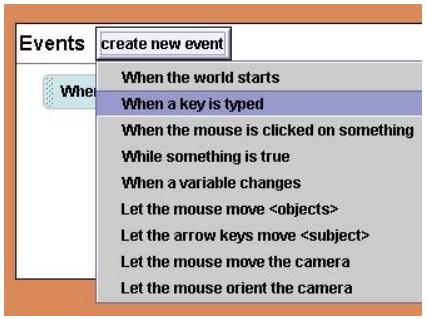
biplane.flyForward

- 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

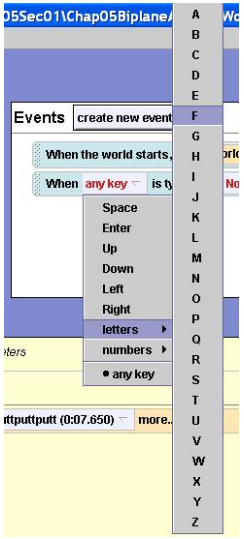
1) Select “create new event”
Then choose the type of event



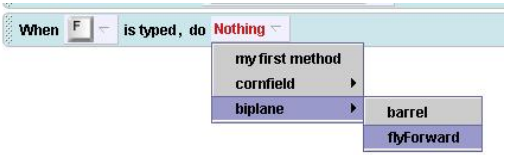
2) A template linking is created

Events Editor – Linking (cont)

3) Select type of key for event

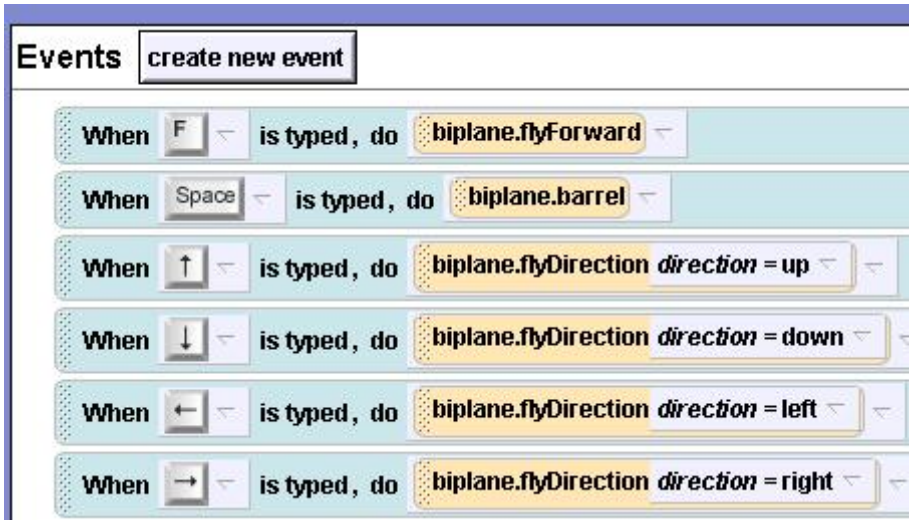


4) Select event handler method



Final result:

More Functionality



Classwork today

- Create 4 buttons and a spider robot
- Press green button and spider moves forward
- Press red button and spider moves backward
- Other two buttons?
- Event for instructions