

Alice

Program Design and Implementation

Scenarios and storyboards

- The previous magician example illustrated a simple **storyboard** which depicts a **scenario**
- Should come up with the scenario and come up with a design or “plan ahead” strategy to construct the program
- Scenario
 - What story is to be told?
 - What objects are needed? Role vs. background?
 - What actions are to take place?

Scenario Example

- Story
 - A robot's first encounter with an alien on a distant moon
- Objects
 - Robot, lunar lander, alien, rocks
- Actions
 - Alien peeks out from behind rocks; robot turns its head and moves toward the alien; the alien hides and the robot sends a message to earth
- To design this scenario we can use **storyboards**

Storyboard

- Can be visual or textual
- Breaks down a scenario into sequences of many short scenarios
 - Depicts the sequence of scenes
 - For an animation there may be dozens of scene sketches drawn by animation artists or generated by computer animation specialists

Example Visual Storyboard

For our purposes, simple stick figures, square, circles, other simple shapes will suffice

From <http://accad.osu.edu/womenandtech/Storyboard%20Resource/>

Visual Storyboard

- Can plan out with screen captures from Alice and manually moving objects around

Initial scene; robot has climbed down the lander and is exploring

Alien appears and says "Slithy toves?"

Robot moves toward alien

Textual Storyboards

- Not everyone has the patience for visual sketches; textual storyboard is a good alternative
- “To-Do List” and prepares us for writing program code
- Example for alien
 - Do the following steps in order
 - Alien moves up
 - Alien says “Slithy Toves?”
 - Robot’s head turns around
 - Robot turns toward alien
 - Do the following steps together
 - Robot moves toward the alien
 - Robot legs walk

Textual Storyboards

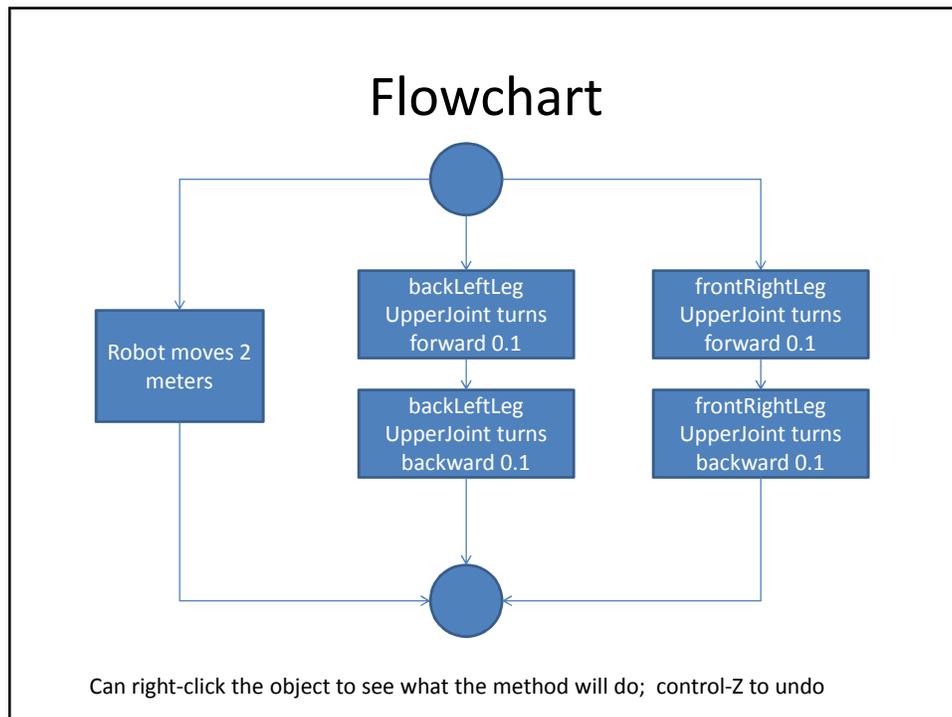
- Evaluate and Revise – storyboard is not final
 - Does the action flow from scene to scene?
 - Do any transitions need to be added to blend one scene to the next?
 - Is anything missing?
 - Should something be changed?
- Design-Modify-Create cycle

Creating a Program

- What instructions are needed for the alien storyboard?
 - Do the following steps in order
 - Alien moves up
 - Alien says “Slithy Toves?”
 - Robot’s head turns around
 - Robot turns toward alien
 - Do the following steps together
 - Robot moves toward the alien
 - Robot legs walk
 - Alien moves down
 - Robot turns to the camera
 - Robot turns red
 - Robot says “Houston, we have a problem!”

To-do In Class

- Program sequential actions for storyboard
 - Drag actions into “Do In Order”
- What about moving forward while moving legs up and down? We want this to happen together
 - Drag the “Do Together” block where you would like things to be done together
 - In our case, drag inside the “Do In Order” but this could be put outside as well



First Attempt

- Do together
 - Move robot forward
 - Turn backLeftLeg forward 0.1
 - Turn backLeftLeg backward 0.1
 - Turn frontRightLeg forward 0.1
 - Turn frontRightLeg backward 0.1

Second Attempt

- Bug in the previous version, everything done together, including moving forward and backward at once
- These should be done in order instead
- Also make sure time adds up to the 2 seconds for the walking motions

Using a Property

- You can drag the property out to the code window to change a value at some point in the program
- Drag the robot's color property and change it to Red

Use Comments

- Drag the // to explain what the program is doing

Motion

- Experiment with
 - Turn
 - Roll
 - Move To
 - Turn To Face
 - Orient To
 - Try putting a beach ball on top of an animal and have the two move forward together
 - Most likely they will not go in the same direction because we can't tell which direction the ball is facing
 - Solution is to "orient to" the same direction
 - Vehicle Property
 - Makes one object belong to another so moving the "vehicle" moves the occupant as well

Arguments: duration, style, asSeenBy

- Duration – self explanatory
- Style – abrupt or gentle motion
- asSeenBy – Defines the directions for forward, backward, up, down, left, right
 - If world, then absolute directions
 - If object, relative to whatever direction that object is facing
 - Book example: helicopter go up but banked