

Creating an Animation Program

Alice



Step 1: Design

- Decide on the problem to be solved
- Design a solution

🎬 We will use a storyboard design technique, commonly used in the film industry

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DESCRIPTION: EXT. FOREST - MS LUKE & LEIA - TRUCKING
Luke & Leia coming toward camera. Behind them, Biker #3 & Biker #4 bank in, chasing.

NOTES:

ELEMENTS:	STAGE	ANIM	PLATE	MATTE	NON-EM
Forest			X		
Luke			X		
Leia			X		
Biker #3	X				
Biker #4	X				

ELEMENTS:	STAGE	ANIM	PLATE	MATTE	NON-EM

SHOT #/SEQUENCE
27-58
BC 28

FRM COUNT PAGE #
50



Example

🌍 The **scenario** is:

First Encounter

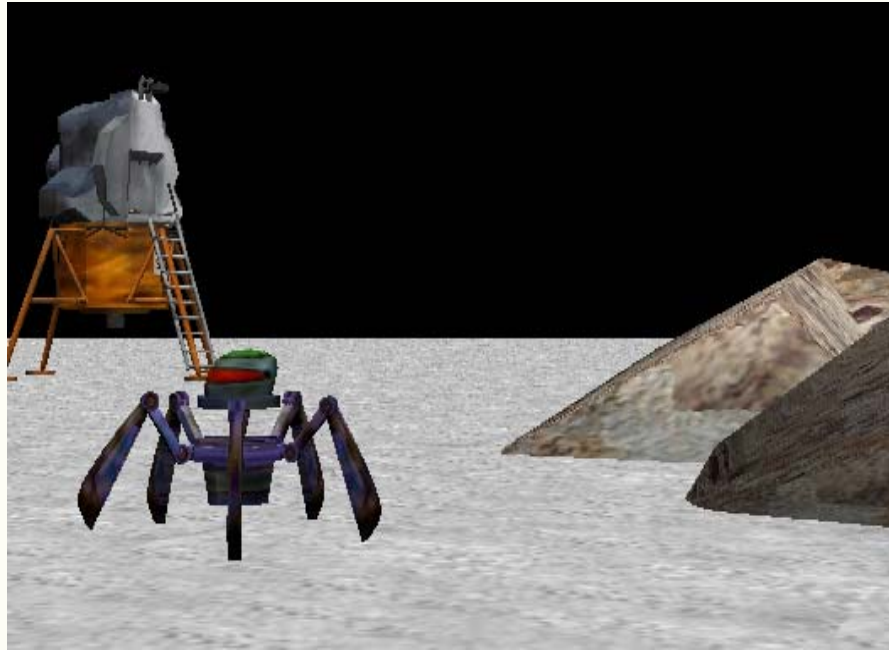
After traveling through space, a robot-manned craft has just made a landing on a moon. The robot is on the moon and has set up a camera so earthbound scientists in Houston can view this historic event. The camera view shows the robot, the lunar Lander and some nearby rock formations. Suddenly an alien peeks out from behind a rock, surprising the robot. The robot looks around, spots the alien, and walks over to take a closer look. The alien is frightened and hides behind the rocks.

🌍 The **problem** is:

How can we create this animation?



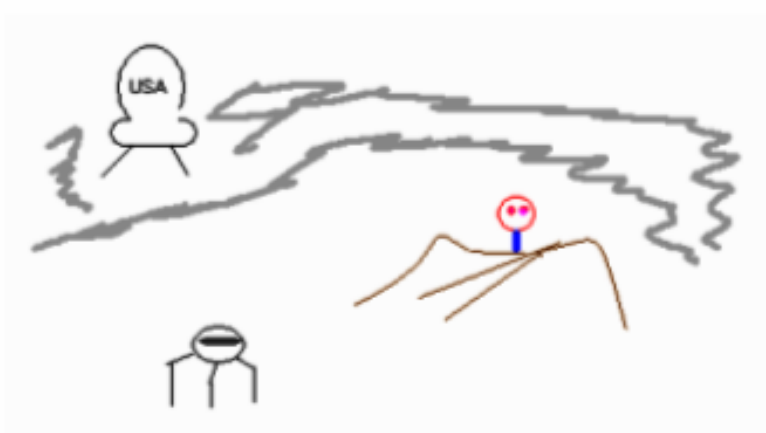
Create Initial World



Storyboard

Option 1: Sketches

Scene Number: 2



Description
Alien peeks up from behind a rock.

Sound: None
Text: "Slithy toves?"



Storyboard

Option 2: Screen Shots

Initial scene



The spiderRobot walks toward the alien



Storyboard

Option 3: Text Form

- A textual storyboard is like a "to-do" list.
- The *Learning to Program in Alice* textbook puts a textual storyboard in a box:

Do the following steps in order
alien moves up
alien says "Slithy toves?"
robot's head turns around
robot turns to look at alien
Do together
robot moves toward the alien
robot legs walk
alien moves down



Step 2: Implementation

🌍 To implement the storyboard, translate the actions in the storyboard to a program.

🌍 **Program** (a.k.a. **script**)

🎥 a **list of instructions** to have the objects perform certain actions in the animation



Writing the Program

- Our planned storyboard (to-do list) is:

Do the following steps in order
alien moves up
alien says "Slithy toves?"
robot's head turns around
robot turns to look at alien
Do together
robot moves toward the alien
robot legs walk
alien moves down

- The idea now is to translate the design steps to program instructions.



Translating the Design

- Some steps in the storyboard can be written as a **single instruction**
 - ▶ The robot turns to face the alien
- Other steps are **composite actions that require more than one instruction**
 - ▶ To make the robot legs walk, each robot leg (five legs) must bend at a joint



Action Blocks in Alice

Sequential Action Block

— actions occur one after another

The screenshot shows a method editor window titled "World.my first method". The window has a yellow background and a blue header bar. Below the header, it says "World.my first method No parameters" and "No variables". The main area contains a single block labeled "(Do Nothing)". At the bottom, there is a toolbar with several icons: "Do in order", "Do together", "If/Else", "Loop", "While", and "For all in order". The "Do in order" and "Do together" icons are circled in red.

Simultaneous Action Block

-- actions occur at the same time



Demo

Ch02FirstEncounter



Concepts in this first program

🌐 Program **instructions** may have **arguments**

🎥 Example: for the **move** instruction, the arguments we used in this example were

💡 direction

💡 distance

🌐 *DoTogether* and *DoInOrder* blocks can be **nested** one inside the other



Testing

- 🌐 An important step in creating a program is to run it – to be sure it does what you expect it to do.
- 🌐 We recommend that you use an **incremental development** process:
 - 💡 write a few lines of code and then run it
 - 💡 write a few more lines and run it
 - 💡 write a few more lines and run it...
- 🔧 This process allows you to find any problems and fix them as you go along.



Comments

- While Alice instructions are easy to understand, a particular combination of the instructions may perform an action that is not immediately obvious.
- Comments are used to document the code – explain the purpose of a particular segment of the program to the human reader.



Demo

● Ch02FirstEncounterwithComments

● Comments in this example world illustrate

- 📺 description of the action performed by the entire method
- 📺 description of the purpose of a small segment of code



Assignment

- Exercises from Chapter 2
 - 📖 Pages 47-49
- Read Chapter 3

