CompSci 94
Flexible Procedures
February 6, 2018

Prof. Susan Rodger
Class Today

- Making procedures more flexible – adding in parameters
- Loops - repetition

- Assignment 3 due Thursday night, Feb 8
  - Turn in Alice worlds using websubmit
  - Build and link to two web pages
  - Put storyboards on web pages
Review 1

• Where in Alice do you add a cameraMarker?

• In my code, how do I place the camera on the cameraMarker so it is looking the direction of the cameraMarker?
Review 2

• How do I get a Hare to circle halfway around a cow in a forward direction if they are both facing front and the Hare is to the right of the cow?
Review 3

• If I want to teach the cow to Dance. How would I create the Dance procedure in Alice?

• How do I test just my Cow Dance procedure?
Setup for Lecture Demo

• Four characters: (left to right)
  – MadHatter, Hare, Cow, Bison
  – The Bison is back further
Built-in Procedures are flexible

- Move – pick direction and how far

Drag into the editor

Choose values

Result is
Write procedures with parameters

• A parameter is a “place holder” for a value

• An argument is the value you put in the place holder
Teach the Hare how to jump – write a procedure

- Click on Scene tab, then Hare, then add Hare procedure
But Wait!!!! A Hare is a Biped! Instead – we could write jump for all bipeds.…

- Click on Scene tab, then Biped, then add biped procedure
All bipeds have the same structure
Write jump for all bipeds
How Far to jump?

- Add parameter for distance to jump
  - Type: DecimalNumber
  - Name: distance

There is 1 invocation to this procedure in your program. You will need to fill in a value for the new argument at the invocation. Tip: look for `unset`.

I understand that I need to update the invocations to this procedure.
Use parameter distance as place holder

- Distance

- Drag over numbers you want to enter
Distance is a place holder for a number

- Distance appears in two places in the code
How high to jump?

• Since we added a parameter for jump, where we call jump, we must now select a number for how high to jump
Add another parameter, how fast to jump

- Parameter speed, add duration with speed
- Drag speed over the duration numbers!
Arguments – values passed to procedures

• Add a value for speed

• madHatter is a biped and can also jump
Another new concept - Looping

- We move code to my first method and drag up count from the bottom and pick a number
Write another procedure for hare to ride a quadruped animal

• Write this one as a Hare procedure
• Focus on the hare jumping on and riding the cow
• But really want the hare to be able to ride any quadruped (4 legs)
Another way to add a procedure

• Choose Hare from menu
• Name procedure ride
Add a parameter **transport**

- The type is a quadruped (from the Gallery class)

- Then name it **transport**
Ride procedure with two parameters transport and distance
Add direction and phrase parameters

- Use new parameters
- Note their types!
Call **ride** procedure twice

- Hare rides cow, then bison
- Bison turns different direction and hare says something different
Final code for ride (part 1)

declare procedure ride

with parameters: Quadruped, transport, DecimalNumber, distance, TurnDirection, direction, TextString, phrase

do in order

- this turnToFace transport add detail
- this moveAndOrientTo transport add detail
- this move UP, distance, duration 0.25 add detail

do together

- this getLeftHip turn LEFT, 0.125 add detail
- this getRightHip turn RIGHT, 0.125 add detail
Final code for ride (part2)
This lecture covered

• Looping code a specific number of times with count

• Making procedures more flexible
  – Add parameter as a place holder
  – Plug in an argument when you call the procedure

• Make a procedure for a biped and it works for all bipeds