Class Today

• Making procedures more flexible – adding in parameters

• Loops - repetition

• Assignment 3 due Tuesday night, Sept. 25
  – 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

![Example of a parameter with default values](image)

- An **argument** is the value you put in the place holder

![Example of an argument](image)
Teach the Hare how to jump – write a procedure

• Click on Class 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
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)

```plaintext
declare procedure ride
with parameters: Quadruped, transport, DecimalNumber = distance,

TurnDirection, direction, TextString, phrase
```

```plaintext
do in order
  this turnToFace transport add detail
  this moveAndOrientTo transport add detail
  this move UP, distance, duration = 0.25 add detail
```

```plaintext
do together
  this getLeftHip turn LEFT, = 0.125 add detail
  this getRightHip turn RIGHT, = 0.125 add detail
```
Final code for ride (part 2)
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 procedure for cow, only works for cow

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