Class Today

• Review for Test 2 – Test is Tuesday, Nov 16
• Look at old Test 1’s and Test 2’s.
  – Lot of reading code, some writing code
  – On old Alice 3 Test 2’s – ignore problem 1 on Spring 18 and Fall 18 Test 2 – we did not do the event pointOfViewChanged
• Old quizzes back up later today
Events 1

declare procedure `sceneActivated`

do in order

this `myFirstMethod`

---

`this` addTimeListener `1.0`

add detail

declare procedure `timeElapsed`

do in order

drop statement here

---

`this` addKeyPressListener

add detail

declare procedure `keyPressed`

do in order

if `isKey` `S` is true then

drop statement here

else

drop statement here
Events 2
Events – when does it start, how does it work?

- sceneActivated
- addTimeListener
- keyPressed
Events – when does it start, how does it work?

• sceneActivated
  – Starts when the world starts and executes all the code in it and then stops

• addTimeListener
  – Specify a time, such as 1.0 and then the event executes over and over, every 1.0 secs

• keyPressed
  – Every time you press any key or the particular key, the event starts executing
Events – when does it start, how does it work? (part 2)

- addMouseClickOnObjectListener

- addCollisionStartListener
  - Uses the variables: getSthingFromSetA, an object from the first array, and getSthingFromSetB, an object from the second array, such that these are the two objects that collided.
Events – when does it start, how does it work? (part 2)

• **addMouseClickOnObjectListener**
  – Specify an array of objects that you can click on, then the variable `getModelAtMouseLocation` is the object you clicked on

• **addCollisionStartListener**
  – Specify two arrays, then whenever one item from one array collides with one item from the other array, then the event starts
  – Uses the variables: `getSthingFromSetA`, an object from the first array, and `getSthingFromSetB`, an object from the second array, such that these are the two objects that collided.
Events – when does it start, how does it work? (part 3)

- defaultModelManipulation
Events – when does it start, how does it work? (part 3)

• **defaultModelManipulation**
  – This lets you click on any object and drag it around.
  – **Warning**: You cannot guard this!
How do you create a Scorer (or counter)

• A scorer/counter
How do you create a Scorer (or counter)

• A scorer/counter
  – Need a 3D textModel (object)
  – Need a textModel property of type number
  – Update the number, then display it in the 3D textModel
  – Write procedures
    • initializeScore, updateScore
How do you create A Countdown Timer

• Need a number and 3D text object
• Update the number by subtracting and then update the 3D text to display it
• Write Procedures:
  – InitializeTimer, UpdateTimer
• Need an addTimeListener Event
  – Will update every specified time unit
How do you create A Countdown Timer

- Need 3D textModel (object)
- Need textModel property of type number
- Update the number by subtracting and then update the 3D text to display it
- Write Procedures:
  - InitializeTimer, UpdateTimer
- Need an addTimeListener Event
  - Will update every specified time unit
  - Need if, update only if game is on
Looping structures - when and how to use each one

• Count loop

• While loop
Looping structures - when and how to use each one

• Count loop
  – When you know exactly how many times the loop will execute, like 4 times

• While loop
  – When the loop stops based on a condition
  – Make sure you update and get closer and closer to making that condition false….
Looping in Array – when and how to use each one

• For each in

• Each in together

• Indexing loop
Looping in Array – when and how to use each one

• For each in
  – Use with an array, to get each item in the array to do something one at a time

• Each in together
  – Use with an array, for each item at the same time to do something

• Indexing loop
  – Use when you need the *position* of array item
  – Use when need to change item in array
  – Use with count or while loop, use array.length
  – Create index variable, initialize it and update it
Randomness

• How do you generate a random number?

• How do you store a random number?

• How do you use a random number?

• What other type of random can you create?
Randomness

• How do you generate a random number?
  – When you use numbers there is an option for random to choose a “random” number from a specified range

• How do you store a random number?
  – Store it in a variable

• How do you use a random number?
  – Access the stored value in the variable

• What other type of random can you create?
  – Random boolean
Arrays

• How do you create an array?

• Where should you create an array?

• How do you access a value in an array?

• What is the advantage of using an array?

• How do you find the position of the first red animal in an array?
Arrays

• How do you create an array?
  – Create a variable/property and check the box for array

• Where should you create an array?
  – In Scene Properties

• How do you access a value in an array?
  – With a loop variable in an array loop
  – Or with a particular index position in the array

• What is the advantage of using an array?
  – Issue one instruction and apply it to every element in the array

• How do you find the position of the first red animal in an array?
  See lecture Oct 26
Problem: Given an array of pandas named `pandas`. Double the size of every other one starting with the second one in the array, one at a time.
Problem: Given an array of pandas named `pandas`. Double the size of every other one starting with the second one in the array, one at a time.

```plaintext
WholeNumber index ← 1
while index < pandas.length
    pandas[index] resize 2
    index ← index + 2
```

USE array index loop!
How do you force events to only happen at certain times?

• Use an if statement with a condition that must be true – If statement is first thing in the event and must be true for the action in the event handler to happen
• Use a state variable – scene property – Use a string with values such as "setup", "playlevel1", "setupLevel2", "playLevel2", and "gameover" – You control game flow
How do you force events to only happen at certain times?

- Use an if statement with a condition that must be true
  - If statement is first thing in the event and must be true for the action in the event handler to happen
  - For example, event true if opacity is > .95

- Use a state variable – scene property
  - Use a string with values such as “setup”, “playlevel1”, “setupLevel2”, “playLevel2”, and “gameover”
  - You control game flow
How to study for the exam

• Practice problem solving
• Redo a classwork, or a procedure or function for a classwork
• Try redoing something from a lecture
• Rewatch videos, redo online quizzes
• Understand topics – reread over lecture notes
• Look at old Alice 3 test 1’s and old test 2’s
• Old Alice 2 tests – think, how would I do this in Alice 3