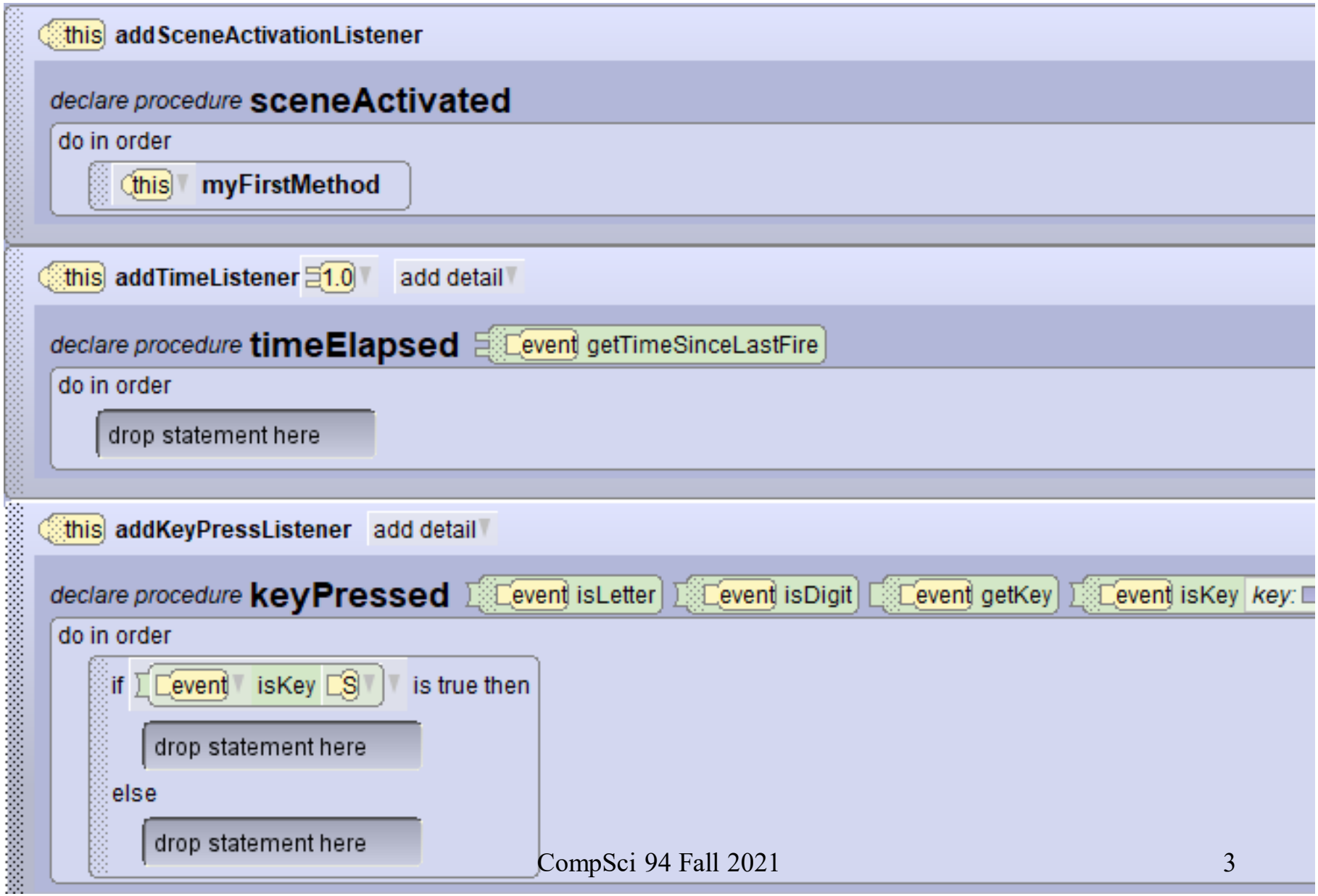
CompSci 94
Review for Exam 2
November 11, 2021

Prof. Susan Rodger

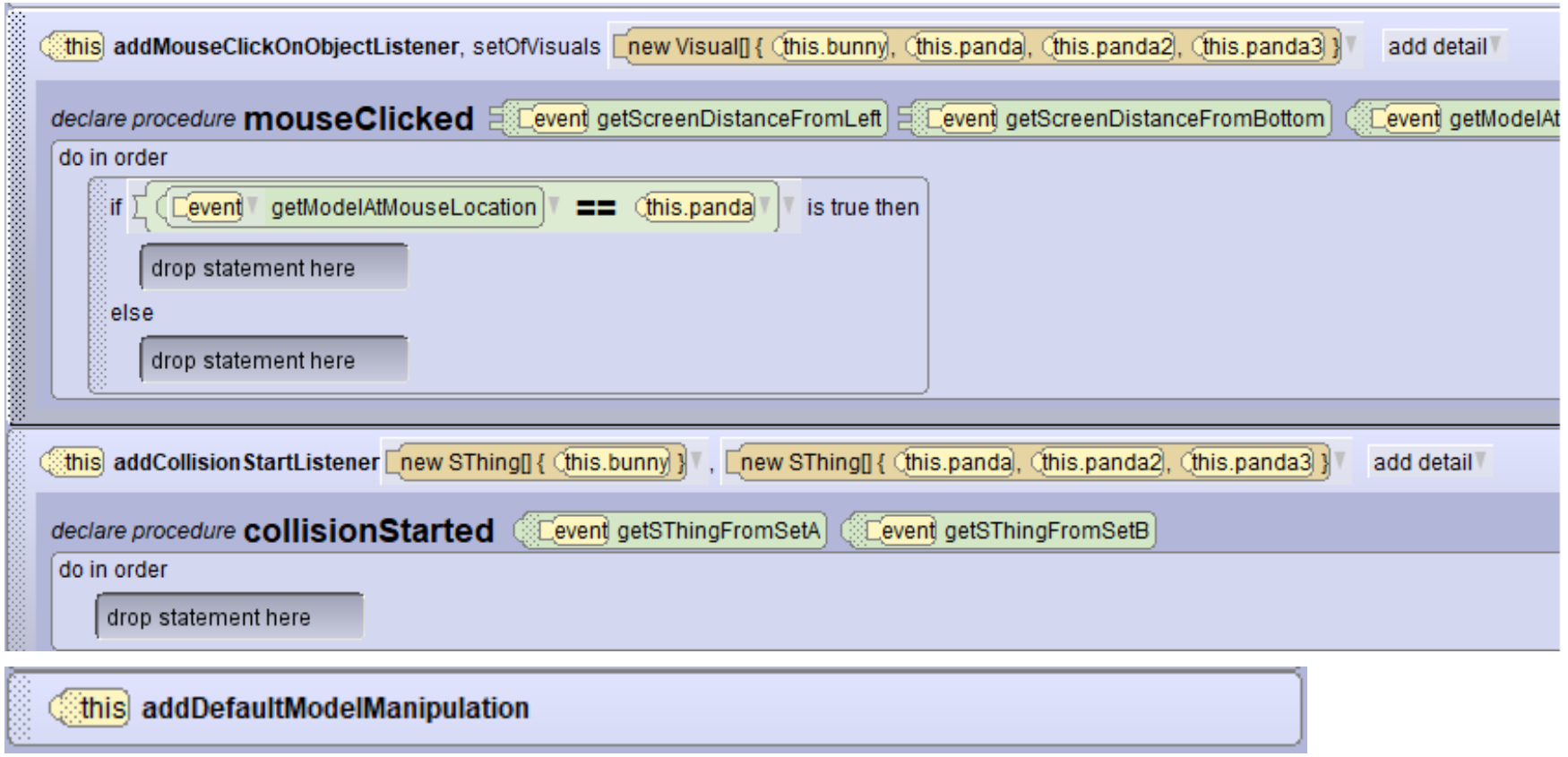
Class Today

- 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


this addSceneActivationListener
declare procedure sceneActivated
do in order
this myFirstMethod
this addTimeListener 1.0 add detail
declare procedure timeElapsed event getTimeSinceLastFire
do in order
drop statement here
this addKeyPressListener add detail
declare procedure keyPressed event isLetter event isDigit event getKey event isKey key:
do in order
if event isKey S is true then
drop statement here
else
drop statement here

Events 2


this addMouseClickOnObjectListener, setOfVisuals new Visual[] { this.bunny, this.panda, this.panda2, this.panda3 } add detail
declare procedure mouseClicked event getScreenDistanceFromLeft event getScreenDistanceFromBottom event getModelAt
do in order
if event getModelAtMouseLocation == this.panda is true then
drop statement here
else
drop statement here
this addCollisionStartListener new SThing[] { this.bunny } , new SThing[] { this.panda, this.panda2, this.panda3 } add detail
declare procedure collisionStarted event getSThingFromSetA event getSThingFromSetB
do in order
drop statement here
this addDefaultModelManipulation

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

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

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

```
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?

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