CompSci 94
Review for Exam 2
November 14, 2019

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Class Today

• Review for Test 2 – Test is Tuesday

• 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 2

```plaintext
declare procedure mouseClicked

do in order
  if getModelAtMouseLocation == this.panda is true then
    drop statement here
  else
    drop statement here

declare procedure collisionStarted

do in order
  drop statement here
```
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.
How do you create a Scorer (or counter)

• A scorer/counter
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• 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 24
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.
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```
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

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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, look at old test 2’s but not problem 1 on test 2’s except Spring 2019
- Old Alice 2 tests – think, how would I do this in Alice 3