CompSci 4
Review for Exam 2
Nov 11, 2008

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Announcements

• Start Java next time
  – We will use Eclipse with Java

• Extended Office Hours.
  – Tue (today): 10:15-11:15, 1:30-2:15pm
  – Wed: 11:00-11:40am, 1-2:15pm
Topics for the Exam

- No HTML
- Alice Chapters 1-2, 4-7, 8.1, 9-10
  - Focus on Chap 5-7, 8.1, 9-10
- Topics
  - Random numbers
  - Looping structures
  - Variables
  - If/else
  - Lists/Arrays
  - Recursion
Random Numbers

• Assume they work
  – Can use == to compare integers
  – Use “integer only” if you want an integer
  – Use “random number” to generate random numbers
    • Maximum is “up to but not including”
    • Default values
Looping Structures

• Loop
  – Simple and complicated
• While
• When to use “while” vs. “if”
• BDE
Conditionals – If/Else

- Format
  
  ```
  if (condition)
  do if true
  else
  do if false
  ```

- Nested ifs
- 3 Logical and 6 relational operators
- When do you use an “if” vs “while”
Variables

• Types
  – Local variable
  – Parameter
  – World variable
  – Class variable

• What do you do with a variable?
  – It stores a value
    • Initialize it
    • Use its value
    • Update it
Lists

• Create a list
• Process a list
  – For all in order
  – For all together
  – Item-in-list
  – Do something to a part of an object
• List search
Array

• Create an Array

• Process an array
  – Loop – complicated version
  – Use value from array
  – Set value in array

• Search for item in an array
Recursion

• Function or method call a “clone” of itself
• Must get closer to ending with each step
• Must be a way out
• Recursion is a loop, but you don’t use “loop” command
• You will need to know recursion at “reading level”
How to Study for the Exam

• Write methods from old classworks
• Lecture notes
• Reading quizzes – will make available
• Reading in book
• Understand the topics
Problem

- Objects are a Bunny and a bunch of frogs. They are all facing the same direction. The Bunny is behind the frogs.
- The frogs are all in a list called “frogs”
- The Bunny and frogs will be moving each time an event occurs. The bunny will move 0.5 meters and the frogs 0.15 meters each time.
- When the Bunny is at least the “Bunny’s depth” in front of all the frogs, it should turn around and say “Stop”
Animation

- Start

- Finish
Write function IsBunnyInFront

• Returns true if Bunny is at least Bunny’s depth in front of all the frogs in the list frogs
• Else returns false
Write method moveAndCheck

• Moves all the frogs in the list frog 0.15m
• Moves the bunny 0.5m
• If the bunny is in front of all the frogs, turns around and says Stop.
For all world.frogs, one item_from_frogs at a time

If bunny is behind item_from_frogs more...

Return false

Else

Do Nothing

For all world.frogs, one item_from_frogs at a time

If bunny distance in front of item_from_frogs more... < subject = bunny 's depth

Return false

Else

Do Nothing

Return true
world.moveAndCheck

No parameters

No variables

- Do together
  - For all world.frogs, every Obj item_from_frogs together
    - item_from_frogs move forward 0.15 meters more...
    - bunny move forward 0.5 meters more...

- If world.IsBunnyInFront
  - bunny turn right 0.5 revolutions more...
  - bunny say stop more...

Else
  Do Nothing