Announcements

- Read Chapter 7, Sec 2 for next time
- Registration time – CPS 6
  - CPS 4 prepares you to take CPS 6
  - For CPS 6 need to know - Objects, methods, conditionals (if), repetition (loop), list or arrays (we will do)
  - Will review these topics in CPS 6 with Java
- Assignment 7 due Tuesday, April 5

What we will do today

- Lecture on Chap 7, Sec 1
  - Definite Loops
- Classwork

Repetition

- In many kind of animations, especially simulation and games, some actions happen again and again
  - Example
    - Games where targets randomly appear and are caught or shot down, then appear elsewhere
- Actions are made to happen again and again by running an instruction or method more than once
Example

• Bunny sneaks into garden and wants to eat broccoli. Bunny needs to hop several times over to broccoli

One solution

• What is the problem with this solution?

Bunny.hop

• Makes bunny hop up and down, making a sound and traveling .8 meters total
• See code in book
• How do we get bunny to hop many times over to the broccoli?

Counted Loop

• A counted loop is an alternative way to write repetitive code
• Repeats instructions a counted number of times
Demo - Code to hop 6 times

- The loop instruction executes a definite number of times, specified by a count
- Using a loop instruction
  - Saves time
  - Is convenient, easy to change the count
  - Can use a function in place of the count (must return a number)

Let’s Modify this animation

- Want the bunny to hop over to the closest broccoli and eat it
- Then hop to the next closest broccoli and eat it
- Move broccoli so not all together
- Only do with 3 broccoli
  - easy to expand to more broccoli

First write whichBrocClosest

Write method bunny.eatBroccoli

- Make bunny turn to face closest broccoli
- Then hop over to it stopping in front of it
- Then eat the broccoli
  - Make it invisible and move it far away
Infinity times….

• If “infinity times” is selected for a loop, loop will run until the program is shut down

Example

• What happens if we make the other bunny hop up and down infinity times?

How do we fix this?

• How do we get both bunnies to move, one infinitely and one definitely?

More Complicated Loops

• It is possible to place a loop within another loop statement, this is nested loops
• Example in book: double ferris wheel
Demo - Ferris Wheel
nested loops

Modify bunny.eatBroccoli

- For each of the broccoli do
  - Make bunny turn to face closest broccoli
  - Then hop over to it stopping in front of it
  - Then eat the broccoli

Classwork today

- Copy file fishGameSetup
- Write function moveTheSame
  - 14 times do
    - Each fish moves .1 m towards appropriate tennisball
    - Then wiggles a little

Classwork (cont)

- Write moveForwardRandomly
  - Do the following 10 times
    - Two fish move randomly .1 to .5 m each time
    - One fish moves steady .2 meters each time
    - Fish move together in same time units
    - Fish must wiggle after each .1m of movement
    - Fish that reaches tennisball first (<.15m) says “I win” for 10 seconds
- Don’t worry about fish still moving after winner declared.