What we will do today

- Lecture on Chap 7 Sec 2 and Tips and Tech.
  - While loop – indefinite loop
  - Event Loops
- Classwork

Repetition

- Sometimes don’t know exactly how many times a set of instructions are repeated.
- Stopping is based on a condition
- Example:
  - Game of Chess, how many moves until win
  - Stop: when markers are in check mate position
Indefinite Repetition

• In programs where number of repetitions now known in advance, can use
  – While statement (today)
  – Recursion (next time - Chap 8)

While statement

condition true?  

no  

exit loop

yes  

execute instructions

• While some condition is true
  – execute instructions

Example

• Common feature in popular “action films” is a chase scene
• Example: hungry shark chasing fleeing goldfish
  – Repeat: fish swim away from shark, and shark swim toward fish
  – Shark swim distance a little more than fish swim distance
  – Eventually, shark will catch up with fish and eat fish

Storyboard

World.chase

While goldfish more than .5 meters from shark
  Do in order
    shark point at goldfish
  Do together
    shark swim (toward goldfish)
    goldfish flee (away from shark)
    shark eat goldfish

shark.Swim, shark.eat and goldfish.flee in book
World.chase

Shark will catch goldfish

- How do you know the shark will eventually catch the goldfish?
  - Shark always moves 0.4 meters towards goldfish
  - Goldfish moves randomly away from shark at most 0.2 meters
  - Shark will eventually catch up, the loop will end

General “Rule of Thumb”

- As a general rule, a While loop should be written so the loop will eventually end
  - Requires statements inside the loop change the conditions of the world such that condition for While eventually becomes false
- If While loop never ends
  - Infinite while loop

Practice – From Bunny eats Broccoli

- Replace with while loop, bunny hops until close to closestBroc (< 1 meter)
Practice – Eat Broccoli until all invisible

Assume method
bunny.hopToClosestBroccoliAndEatIt exists

ReWrite with while loop

• Eat broccoli (broc1, broc2, and broc3) until gone (all invisible)
• Assume at least one of the brocs is visible when start

Classwork today

• Modify play method in CinderellaMeetsPrince
Rewrite Play method

- Do not change any code except the Play method
- Use a while instead of a loop infinitely
- Cinderella and Prince randomly move until they meet in the middle – Note they STOP!
- If one gets to middle alone, then they turn and start over.

- Download willTheyMeetToFix.a2w