CompSci 94
Undetermined Repetition with While loop
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Looping – exact number of times

• Count loop

• How many steps to get to the panda?
  – 3, 6, 8?
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
  – Where number of repetitions not known in advance
  – Use while statement
While statement

- While some condition is true
  - execute instructions

```
While statement

condition true?

condition true?

execute instructions

yes

no

exit loop
```

- While some condition is true
  - execute instructions
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
Compare – What is difference?

```plaintext
do in order
  `this.bunny` turnToFace `this.panda` add detail

count up to ≥ 3
  `this.bunny` walk
loop

do in order
  `this.bunny` turnToFace `this.panda` add detail

while `this.bunny` getDistanceTo `this.panda` - `this.panda` getWidth ≥ 1.0 is true
  `this.bunny` walk
loop
```
Compare – What is difference?

- While loop stops when bunny is close to panda
- Count loop bunny just walks three times
What happens when run?

- First loop, falcon moves down until partially in the ground.
- Second loop, nothing happens since the condition is never true. The pig is not above ground.
What happens when run?

- First loop, falcon moves down until partially in the ground
- Second loop, nothing happens since the condition is never true. The pig is not above ground.
What happens, when does the loop stop?

- They move towards each other repeatedly until their distance is less than 1.0.
What happens, when does the loop stop?

- They move towards each other repeatedly until their distance is less than 1.0
What happens, when does the loop stop? (numbers different)
What happens, when does the loop stop? (numbers different)

- They move way too much compared to how close they are suppose to be. This could be an infinite loop!
What happens when this runs?

• This is an infinite loop! The bunny is never red when the condition is tested. So the condition is always true!
What happens when this runs?

• This is an infinite loop! The bunny is never red when the condition is tested. So the condition is always true!
What code could I use to stop this loop?

```plaintext
// How do I stop this loop? What do I put in place of true?
while (true) is true
  this.bunny.resize(1.3); add detail
loop
```
What code could I use to stop this loop?

- Continue while height smaller than some number. Stop when height is bigger.
Announcements

• Qz12 and videos for next time
Class Today

- Catching dinner