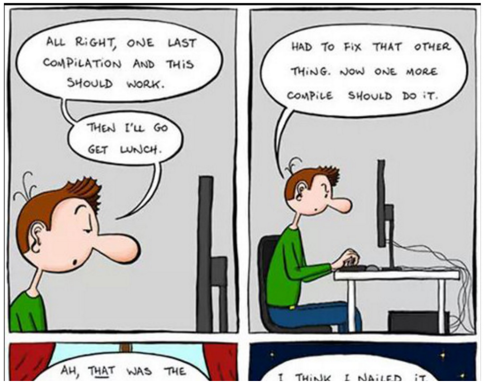
CS 11114

Introduction to Software Design

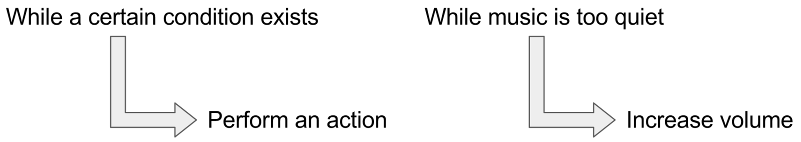
Spring 2017 - Michael Irwin


ALL RIGHT, ONE LAST COMPILATION AND THIS SHOULD WORK.
THEN I'LL GO GET LUNCH.
HAD TO FIX THAT OTHER THING. NOW ONE MORE COMPILE SHOULD DO IT.
AH, THAT WAS THE
I THINK I NAILED IT

Program #1

Performing Repetitive Tasks

- We make repeating decisions everyday based on input
  - If the music is too quiet, turn up the volume
  - If I don't feel ready for a test, keep studying
- Computers are designed to easily repeat tasks
  - Humans easily get bored, sidetracked, or lost in the process



Representing While Loops in Code

- There are two main types of loops
  - `while` loops
  - `for` loops (we'll talk about in a future lecture)
- The recipe...
  - Starts with reserved word `while`
  - Parentheses surround the test (same as `if` statements)
  - Actions surrounded by braces

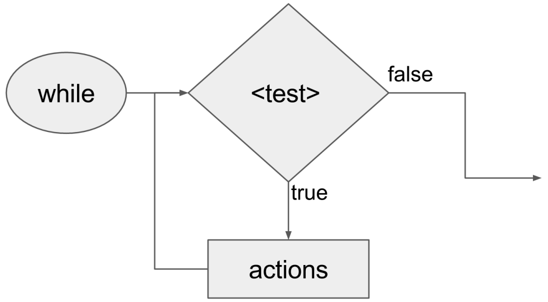
```
while (<conditional test>) {
  // actions go here
}
```

```
while (musicTooQuiet()) {
  increaseVolume();
}
```

How's it work?

1. Loop starts by evaluating the `<test>`
2. If `<test>` is true, execute the actions. Go back to step 1
3. If `<test>` is false, skip over actions

```
while (<test>) {
    // actions go here
}
```



Building a while loop

1. Figure out what must be true to finish looping
2. Define a test that is the opposite of Step 1’s condition
3. Within the `while` loop body, make progress towards the goal

Looping errors

- What's wrong with the code snippet below?

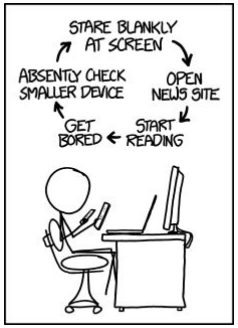
```
while (this.isFacing(NORTH)) {
    this.hop();
    this.pick();
}
```

Looping errors

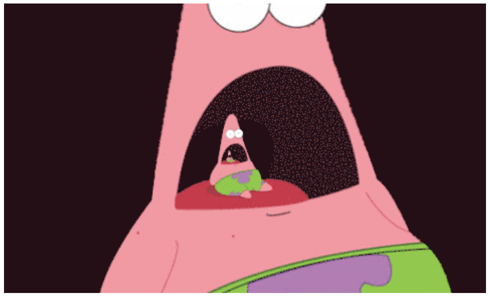
- What's wrong with the code snippet below?

```
while (this.isFacing(NORTH)) {
    this.hop();
    this.pick();
}
```

It's an **infinite loop**!


STARE BLANKLY AT SCREEN
OPEN NEWS SITE
START READING
GET BORED
ABSENTLY CHECK SMALLER DEVICE

CAUTION



Don't get stuck in infinite loops!

Make progress towards the goal

Today's Scenario

- We have a world that creates random "hurdles"
- Want to make our `Jeroo` smart enough to hop "over" the hurdles
- Scenario ZIP has TODO comments to provide hints