QND Computer Science Day 8

Mr. Schmidt

Agenda

- Computer History (brief, relax)

- Basic Math

- Project

Math

- Early computers were made for math!
- Codebreaking
- Artillery Range Tables
- Aerodynamics

Early Computers

- Before the machines, computer was a job!

- Largely held by women

- Margaret Hamilton with her Apollo Lunar Lander program

Computer Programming

- Transitioning to physical computers was slow

- Women computers took advantage and gained engineering roles

- Judith Love Cohen

Math and Computers Today

- Computers are constantly doing math

- Building modern programs requires a ton of math

- Video Games require the most complex math

What does this do?

```
let a = 5
let b = 4

let result = a + b

console.write(result)
```

The Square Calculator

- Ask the user for a number

- Square it and console.write the result

```
let number = console.read("Enter a number to square: ")

console.write(number * number)
```

Types

- Strings
  - Sequence of characters
  - Can be empty
  - Put in quotes
  - Can be combined with other strings
- Integers
  - A number with no decimal

The Square Calculator (fixed)

```
let numberString = console.read("Enter a number to square: ")
let number = Int(numberString)!

console.write("Squared: " + String(number * number))
```
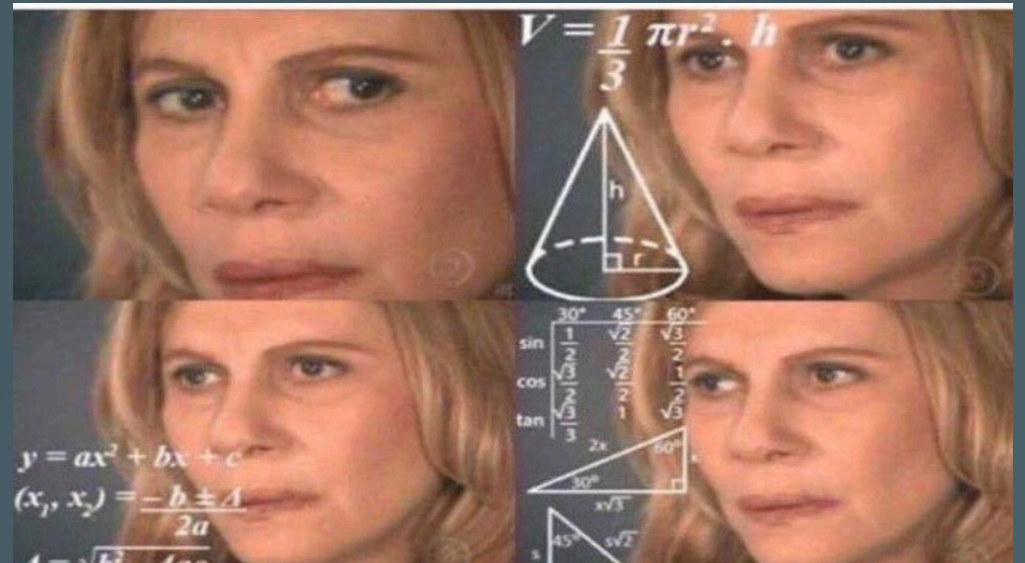
- `Int()!` converts a string to an integer

- `String()` converts an integer to a string

- Note the !

  - What happens if we try `Int("just a string, not a number")!`

- Why doesn't `String` have a `!` ?

Decimals

- What will this do?

```
let a = 0.1
let b = 0.1
console.write(String(a + b))
```

This has caused a lot of problems

- Banks deal with decimals a lot!

```
let myBalance = 200.20
let purchasePrice = 100.20
let finalBalance = myBalance - purchasePrice
console.write(String(finalBalance))
```

Types

- Strings
- Ints
- Floats
  - Store decimal values
  - Imprecise (be careful!)

Project

Make a **calculator**

- Use `console.read()` twice to get two integers
- Don't forget `Int()!`

Compute the sum, console.write it out!

Calculator Improvements

- Use `console.read()` again to get an operation

- Add, Subtract, Multiply, Divide

- Use `if` to handle the operation

Extra Challenges

1. Also console.write the difference (-)

2. Also console.write the product (*)

3. Also console.write the quotient (/)

4. Use `Double` instead of `Int` for decimals

5. What happens if we divide by zero?