

QND Computer Science Day 8

Mr. Schmidt

Agenda

- Computer History (brief, relax)
- Basic Math
- Project

World War II

- Early computers were made for math!
- Better math -> better weapons
- Better weapons -> win the war
- Codebreaking



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
- AI stuff?
 - That's just math

What does this do?

```
let a = 5
let b = 4

let result = a + b

console.write(String(result))
```

- `String()` converts a number to a string

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(String(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)!

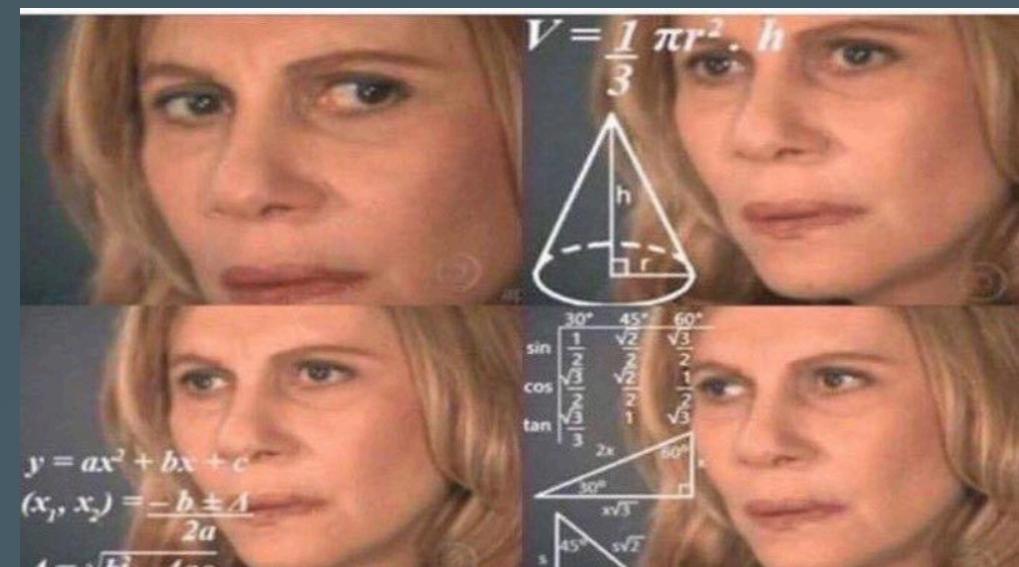
console.write("Squared: " + String(number * number))
```

- `Int()!` converts a string to an integer
- 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 (also called Doubles)
 - 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?