QND Computer Science Day 1

Mr. Schmidt

Agenda

- Learning philosophy
- Programming Languages
- Swift
- Tools
- Your first (actual) program

Learning Philosophy

- You will not master everything today
- You will (probably) be lost
- That's okay!
- Practice, practice, practice
- Help each other!

Machine Code

- Hard to write and understand
- Different computer types use different machine code

```
.text:00000000 _sub:      push    ebp
.text:00000001            mov     ebp, esp
.text:00000003            mov     eax, [ebp+8]
.text:00000006            mov     ecx, [ebp+0Ch]
.text:00000009            lea     eax, [ecx+eax*2]
.text:0000000C            pop     ebp
.text:0000000D            retn
.text:00000010 _main:     push    ebp
.text:00000011            mov     ebp, esp
.text:00000013            push    ecx
.text:00000014            mov     eax, [ebp+0Ch]
.text:00000017            mov     ecx, [eax+4]
.text:0000001A            push    ecx
.text:0000001B            call    dword ptr ds:__imp__atoi
.text:00000021            add     esp, 4
.text:00000024            mov     [ebp-4], eax
.text:00000027            mov     edx, [ebp-4]
.text:0000002A            push    edx
.text:0000002B            mov     eax, [ebp+8]
.text:0000002E            push    eax
.text:0000002F            call    _sub
.text:00000034            add     esp, 8
.text:00000037            mov     esp, ebp
.text:00000039            pop     ebp
.text:0000003A            retn
```

Programming Languages

- *Compile* to machine code
- Many, many different languages

Swift

- Programming Language created by Apple
- Used for creating iOS and macOS applications
- Simple and modern!

My Website

- Everything you need is at markschmidt.io/qnd
- Presentation slides
- Code links

Swift Playgrounds

- We need a coding environment
- We'll use Swift Playgrounds
- Normally for iOS App Development
- Use a template to do simple starter coding

Setup

- Go to markschmidt.io/qnd
- Download the template under Day 1
- Unzip the template and open in Swift Playgrounds

Swift Playgrounds Template

- All of our code will live in **Main**
- All of our code goes in the `start` function
- `{` and `}` are the start and end of a function

```
func start(console: TextConsole) {

}
```

Hello World!

Type the following into the code editor:

```
console.write("Hello World!")
```

Then tap the ▶️ **Run** button on the bottom right

You should see `Hello World!` appear in the console!

Strings

- A sequence of characters
- Characters
  - Letters, numbers, punctuation, emoji 🚀🚀🚀
- Always between quotation marks `" "`

The `write` Function

- `console.write("Hello 🦀🦀🦀")`
- Writes the provided string to the console output
- Add emoji with `control` + `command` + `spacebar`
- We will see many, many other functions
- `function(input1, input2, input3...)`

Repitition

- Our program can have multiple lines!

```
console.write("Hello 🦀🦀🦀")
console.write("Hello 🦀🦀🦀")
console.write("hello from Swift!")
console.write("hello from Swift!")
console.write("hello from Swift!")
```

Variables

- *Declare* variables with `let`
- Just like in math, replaces the variable with a value
- Read it as "Let greeting equal ..."

```
let greeting = "Hello 🦀🦀🦀!"
console.write(greeting)
console.write(greeting)
console.write(greeting)
```

Concatenation

- Combine variables together!

```
let greeting = "Hello "
let name = "Mr. Schmidt"
console.write(greeting + name)
```

This program is boring!

- It needs to respond to user input
- Use `console.read`
- Waits for the user to type in the console and press Enter
- Stores the value in a variable

```
let name = console.read("What is your name?")
```

- Use concatenation to say hello!

One More Thing

- Comments + Spacing
- Empty lines can be ignored
- Anything after a `//` is ignored by the program

```
// Ask the user for their name
let name = console.read("What is your name?")

// Note the space after Hello
let greeting = "Hello "
console.write(greeting + name)
```

Extra Challenges

- `console.write` the greeting 3 times
- Ask a user for their name and their favorite color. `console.write` each out 3 times.
- `console.write` empty lines between each line of output
  - What happens if we pass `""` to `console.write`?

Exit Ticket