CS-121:
Week 2

🗣️ Class Communications?

1. Discord
2. Email
3. Email & Discord

📅 **Upcoming**

- Project 1: Due by end-of class on Thursday
- Lab 2: Starts Wed. at 2:30pm
- Project 2: Starts Thursday at 3pm

Feedback

- Request a Code Review
- Office Hours
- Final grade + feedback will be given within 1 week of the project deadline

🧠 Thinking like a programmer

💻

Thinking like a

~~programmer~~

computer

How do computers "think"?

- They **don't**... you do and they follow your instructions
- Literally: They do exactly what you tell them to do
- Linearly: One instruction (line) at a time

Your Functions

- `clap(x)`: Clap your hands x times
- `slam(x)`: Slam your hands on the table x time
- `raise_hand(which_hand)`: Raise your hand (left or right)
- `say(something, volume)`: Say something out loud at a certain volume

Program 1:

```
👉 clap(3)
slam(2)
raise_hand("left")
say("Sssssssssss!", "whisper")
```

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Program 1:

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clap(3)
slam(2)
raise_hand("left")
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```

Program 2:

```
👉 raise_hand("right")
raise_hand("left")
say("Touchdown!", "loud")
```

Program 2:

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Program 2:

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raise_hand("right")
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Program 3:

```
# Load variables into memory
🧠 message = "Hello, world!"
slam_count = 1
clap_count = 3
```

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🧠  clap_count = 3
```

Program 3:

```
👉 clap(clap_count)
slam(slam_count)
say(message, "loud")
```

Program 3:

```
clap(clap_count)
👉 slam(slam_count)
say(message, "loud")
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Program 3:

```
clap(clap_count)
slam(slam_count)
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```

💪 Feel the power

- We ran this "mind program" with 14 of us at once
- Real programs can millions of times per second on millions of computers
- Computers are powerful, but they are not smart, you are smart.

Thinking like a programmer is about breaking down a problem into executable steps

A problem well-stated is a problem half-solved

What are my inputs? What are my outputs?

???

Input $\longrightarrow$ Output

Input —— Code ——> Output

Example Problem: Raffle Ticket

- You have a list of raffle tickets
- You need to pick a random ticket
- You need to announce the winner

Input: List of Raffle Ticket Numbers

Output: Winning Ticket Number

```python
import random

tickets = ["#A123", "#A124", "#A125", "#A126", "#A127"]
winning_ticket = random.choice(tickets)

print(f"The winning ticket is: {winning_ticket}")
```

```javascript
const tickets = ["#A123", "#A124", "#A125", "#A126", "#A127"];
const winningTicket = tickets[Math.floor(Math.random() * tickets.length)];

console.log(`The winning ticket is: ${winningTicket}`);
```

```csharp
using System;

class Program
{
    static void Main()
    {
        var tickets = new string[] { "#A123", "#A124", "#A125", "#A126", "#A127" };
        var winningTicket = tickets[new Random().Next(tickets.Length)];

        Console.WriteLine($"The winning ticket is: {winningTicket}");
    }
}
```

```swift
let tickets = ["#A123", "#A124", "#A125", "#A126", "#A127"]
let winningTicket = tickets.randomElement()!

print("The winning ticket is: \(winningTicket)")
```
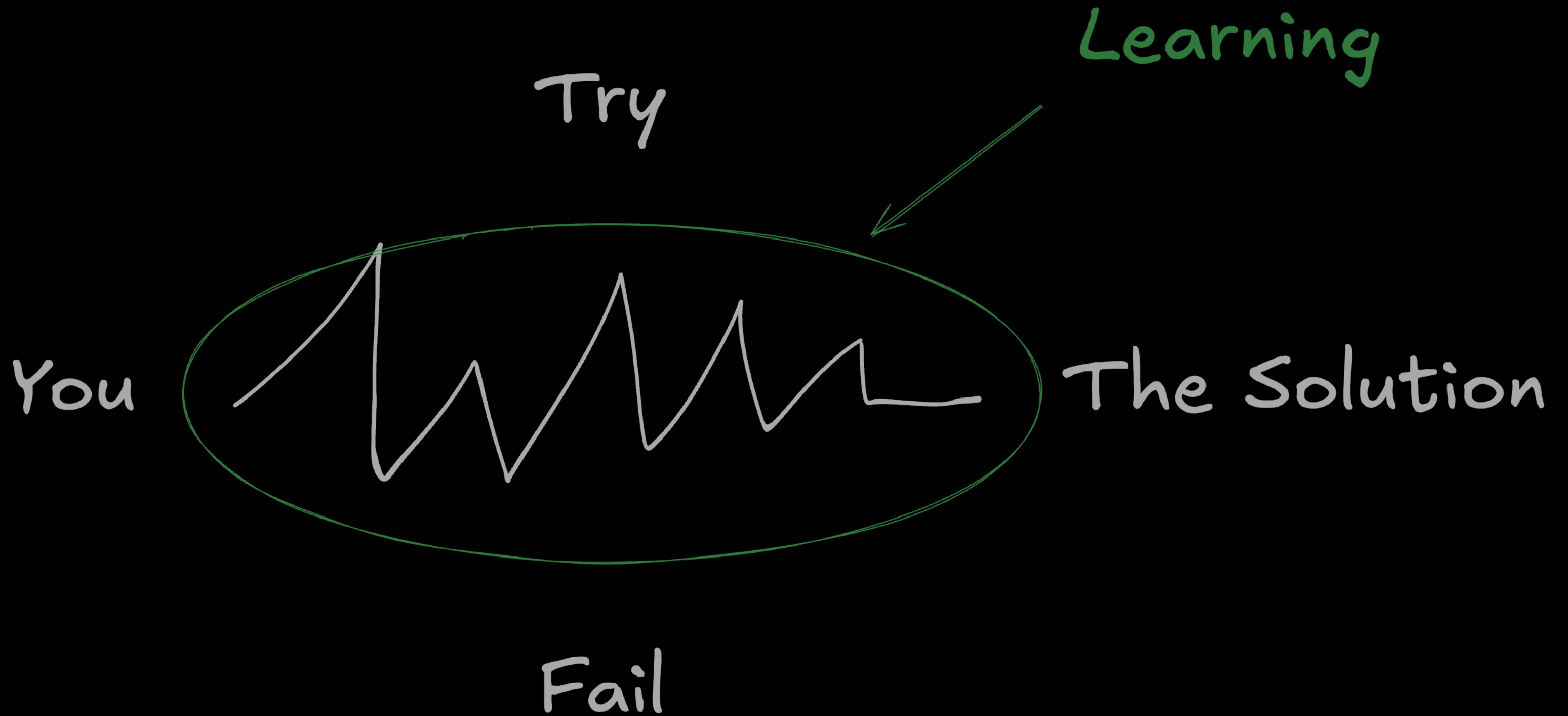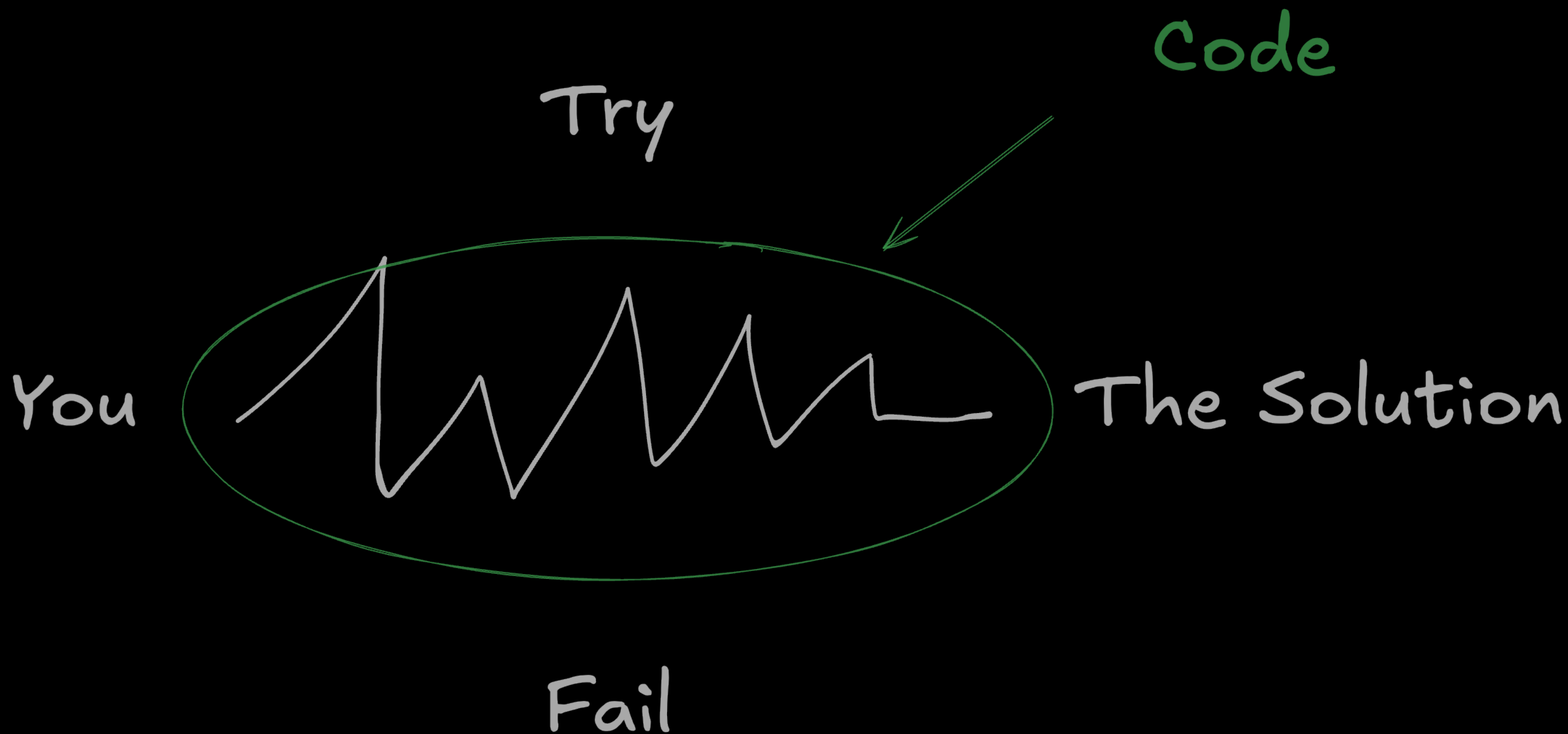
Input $\xrightarrow{\text{Code}}$ Output

Keyboard $\xrightarrow{\text{Code}}$ Screen
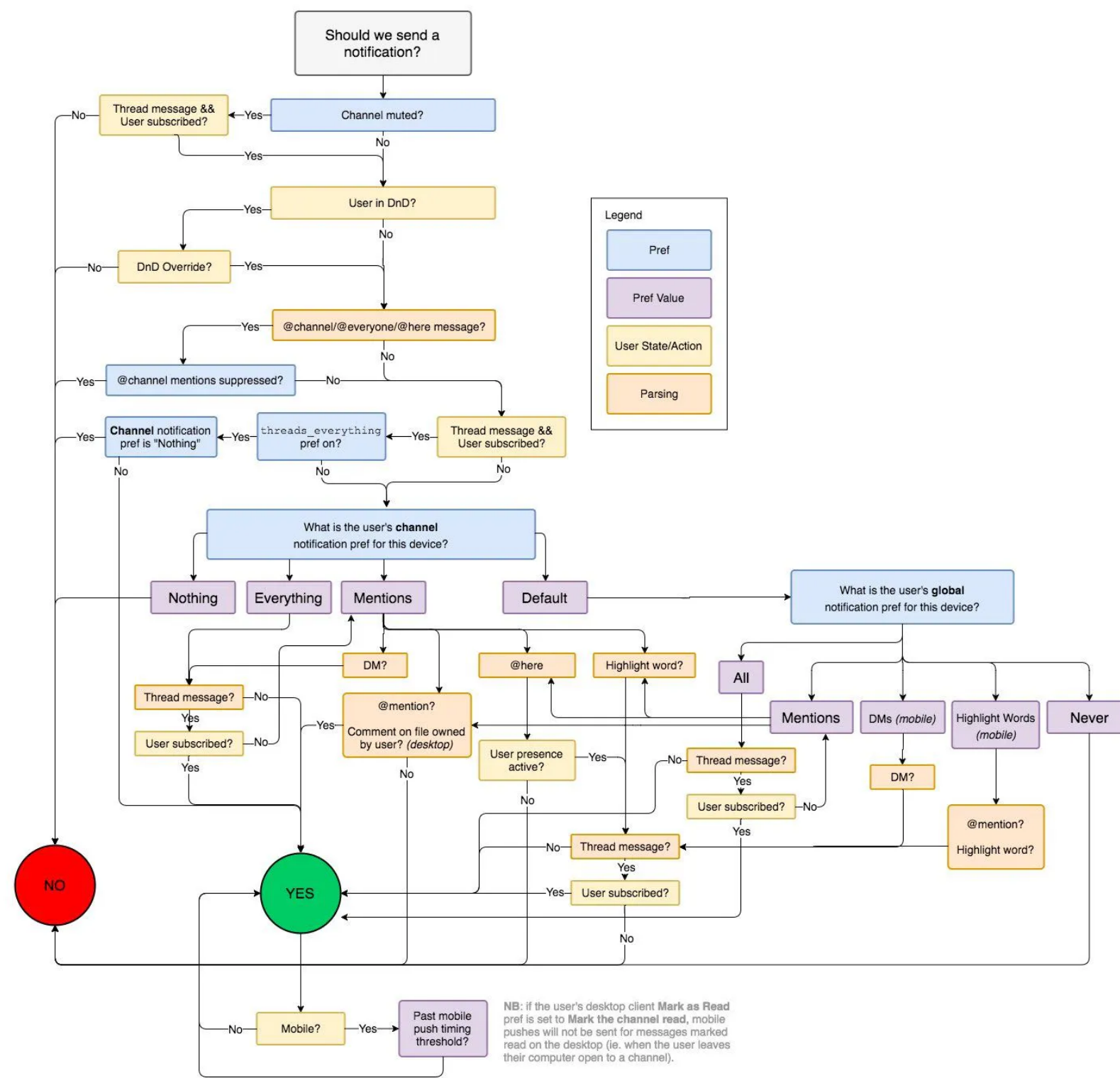
Your Voice → **iOS Code** → Siri

Variable Types (Review) (Data Types)

- Strings (str): Text data, like `"Hello, World!"`
- Integers (int): Whole numbers, like `42` or `-10`
- Floats (float): Decimal numbers, like `3.14` or `-0.5`
- Booleans (bool): `True` or `False` values

What type?

- A person's name
- A person's height
- An address
- The value of Pi
- Drinks coffee (yes or no)

🕹️ **Inputs**

```python
name = input("What is your name? ")

print(f"Hello, {name}!")
```

f-strings

```python
name = input("What is your name? ")
time_of_day = "afternoon"

# These print the same thing
print("Hello, " + name + ", good " + time_of_day + "!")
print(f"Hello, {name}, good {time_of_day}!")
```

```python
x = 10
y = 20
print(f"The sum of {x} and {y} is {x + y}")
```

🧪 Lab 2

"Notebook" Project

- A general repo for you to practice code and take notes
- Put whatever you want in there

Project Work

🔄 Refactoring

- Changing the code without changing its behavior
- Making it more readable, efficient, or maintainable
- Incorporating new techniques or best practices

General Q/A

Project 2: You`.py`

- We'll be taking the concept around `me.py` and turning it into an interactive input that builds out a profile for the user

Go Time 🚀

- Focus on Code
- Ask for Help
- Push and commit what you have before you leave