Swift, an Introduction

Setup, Demo, Variables, Types, print()
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What is Swift, and Why?

"Swift 3 - The powerful programming language that is also easy to learn"

–Apple

- Transitions well to App Programming (uses Swift + Java)

- Transitions well to Robot Programming (uses C++)

Environment Setup

Follow **ALL** the Directions Here:

https://github.com/frc1678/vagrant-box

Demo "vagrant up"

Constants

What is a Constant?

- Name Attached to a Value

- The Value Can Not Be Changed After Creation

Examples

```
let a = 5

let b = 5 + 9

let c = 8.72

let name = "Donald"
```

Parts of a Constant

```
let b = 5 + 9
```

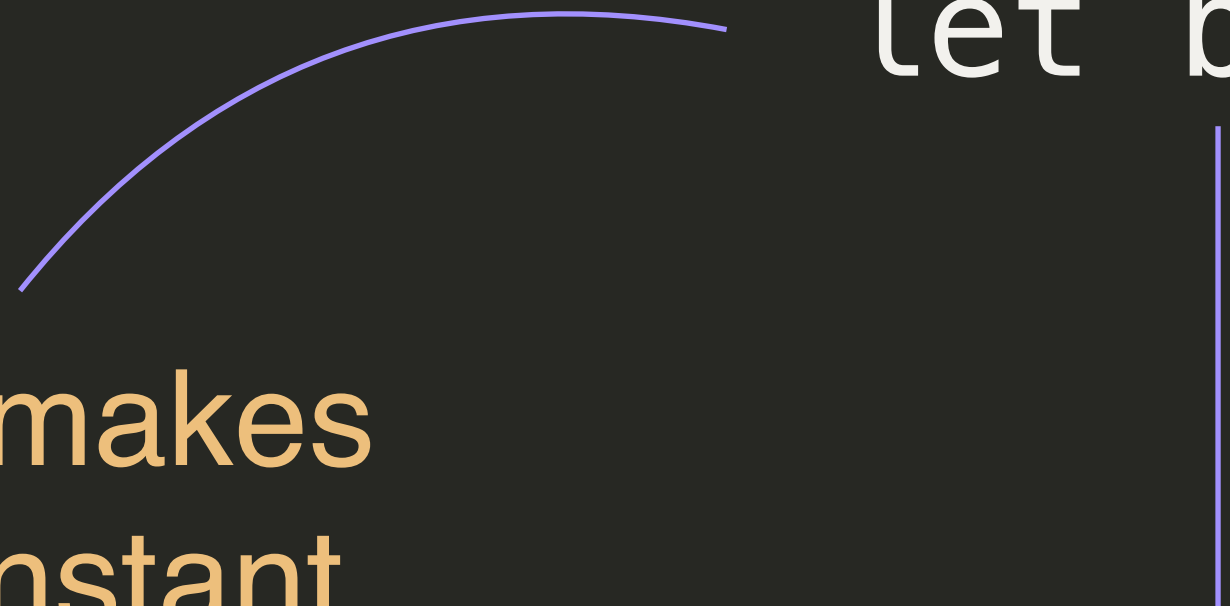# Parts of a Constant

```
let b = 5 + 9
```
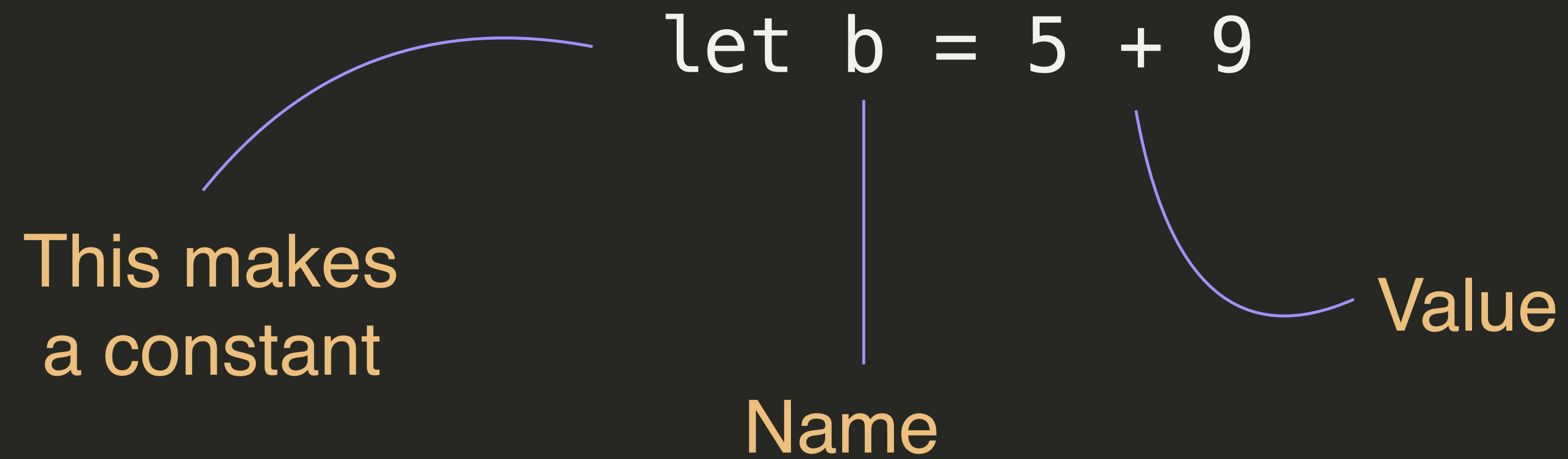
This makes
a constant

Parts of a Constant

```
let b = 5 + 9
```

This makes
a constant

Name

Parts of a Constant

```
let b = 5 + 9
```

This makes
a constant

Name

Value

Types

What Are Types?

- Categories for different kinds of data

  - Int: 5, 9, 2, -8, etc.

    - Whole numbers only!

  - Double: 1.3, 8, -98.3, etc.

    - Any decimal number!

  - String: "Ash", "🐱", "Donald"

    - Text only!

EVERY Constant Has a Type

- Swift guesses the **type** of your constant

  - This makes your code clearer and more concise

- You do need to understand types, since this doesn't always work

- Example:

```
 1> let a = 9
a: Int = 9
```

Demo Constants and Types

Sometimes Swift Guesses Wrong

```
  1> let angle = 45
angle: Int = 45
  2> let delta = 10.5
delta: Double = 10.5
  3> let angle2 = angle + delta
error: repl.swift:3:20: error: binary
operator '+' cannot be applied to operands of
type 'Int' and 'Double'
```

Tell Swift the Type Directly

```
  1> let angle: Double = 45
angle: Double = 45
  2> let delta = 10.5
delta: Double = 10.5
  3> let angle2 = angle + delta
angle2: Double = 55.5
```

Parts of a Constant Revisited

```
let b: Int = 5 + 9
```

Parts of a Constant Revisited

```
let b: Int = 5 + 9
```
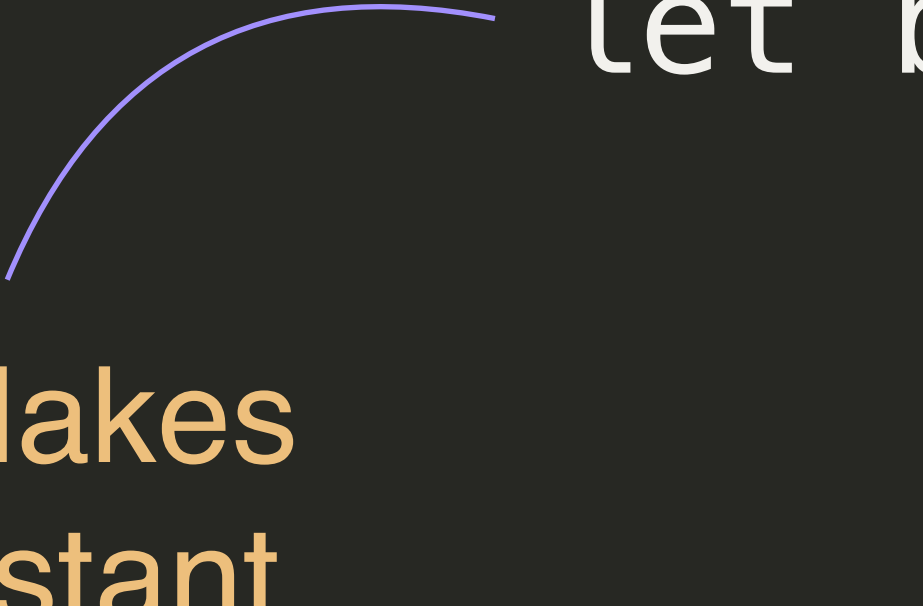
This Makes
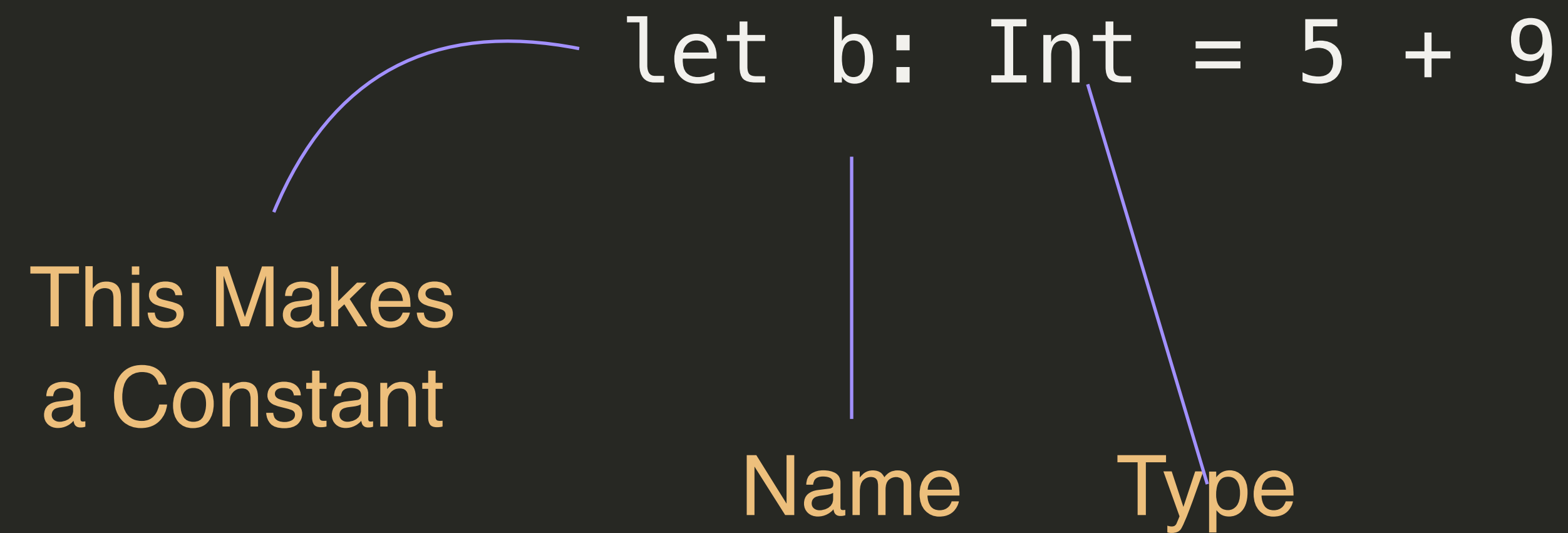a Constant

Parts of a Constant Revisited

```
let b: Int = 5 + 9
```
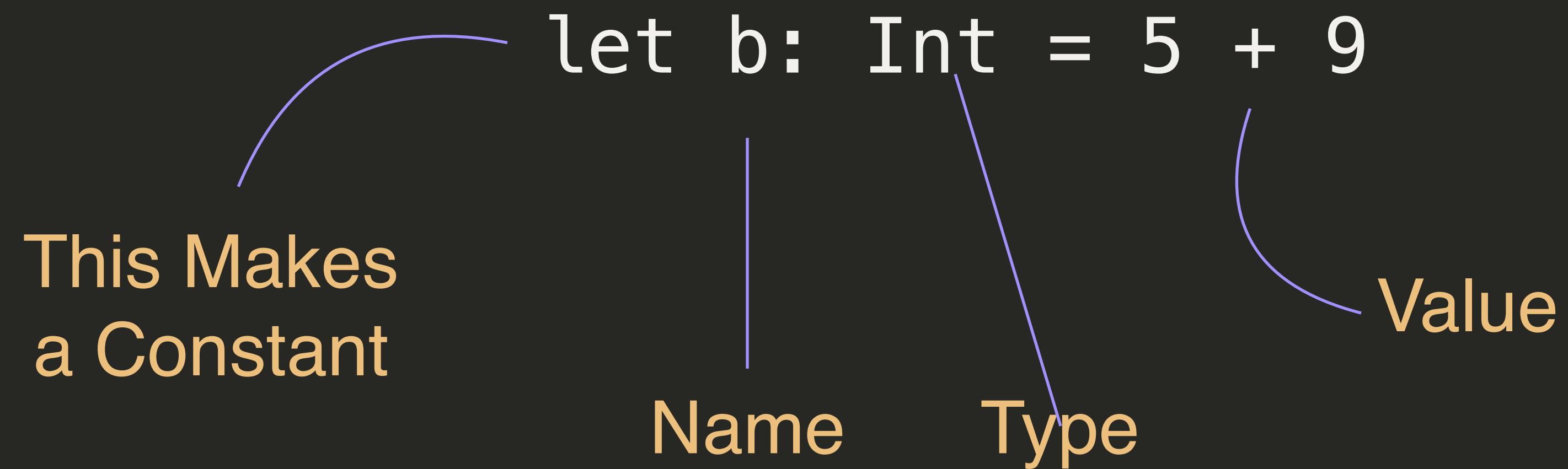
This Makes
a Constant

Name

Parts of a Constant Revisited

```
let b: Int = 5 + 9
```

This Makes
a Constant

Name   Type

Parts of a Constant Revisited

```
let b: Int = 5 + 9
```

This Makes
a Constant

Name   Type

Value

What Types Are There?

- MANY MANY MANY TYPES!!!

- For Now, Only Know:

  - `let a: Int = 6`

  - `let b: Double = 4.2`

  - `let c: String = "Donald"`

Program Output

print() Command for Output

```
  1> print("Donald")
Donald
  2> print(5*98.4)
492.0
  3> print("Donald is \(21 * 12) months old")
Donald is 252 months old
  4> let team = 1678
team: Int = 1678
  5> print("Donald is \(21 * 12) months old, and mentors
team \(team)")
Donald is 252 months old, and mentors team 1678
```

How to Actually Run Code

2 Ways to Run Code

- For experimenting, use the REPL

  - Run the command "swift", and then type code line by line to experiment

  - Type ":q" and hit enter to quit

- For final programs use a file

  - Write your code in a file, for example, "hw1.swift"

  - Then run the command "swift hw1.swift", or whatever your file is named.

  - If you use ~/Documents in vagrant, it will be synced to your computer.

  - See demo screenshot walkthrough, which will be emailed out.