For Loops

Donald Pinckney and Ash Dreyer

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For Loops: Convenient While Loops

This While Loop is **REALLY** Common

```
let array1 = [5, 7, 2]

var i = 0
while i < array1.count {
   print(array1[i])
   i += 1
}
```

For Loops: Common While Loops

- Iterating over arrays is very common
- Counting from one number to another is very common
- Both of these common while loops are **much** easier with for loops

Example: Counting to 10

```
var x = 1
while x <= 10 {
   print(x)
   x += 1
}
```

```
for x in 0...10 {
   print(x)
}
```

Parts of a For Loop

```
for x in 0...10 {
    print(x)
}
```

Parts of a For Loop

```
for x in 0...10 {
    print(x)
}
```

The iteration variable

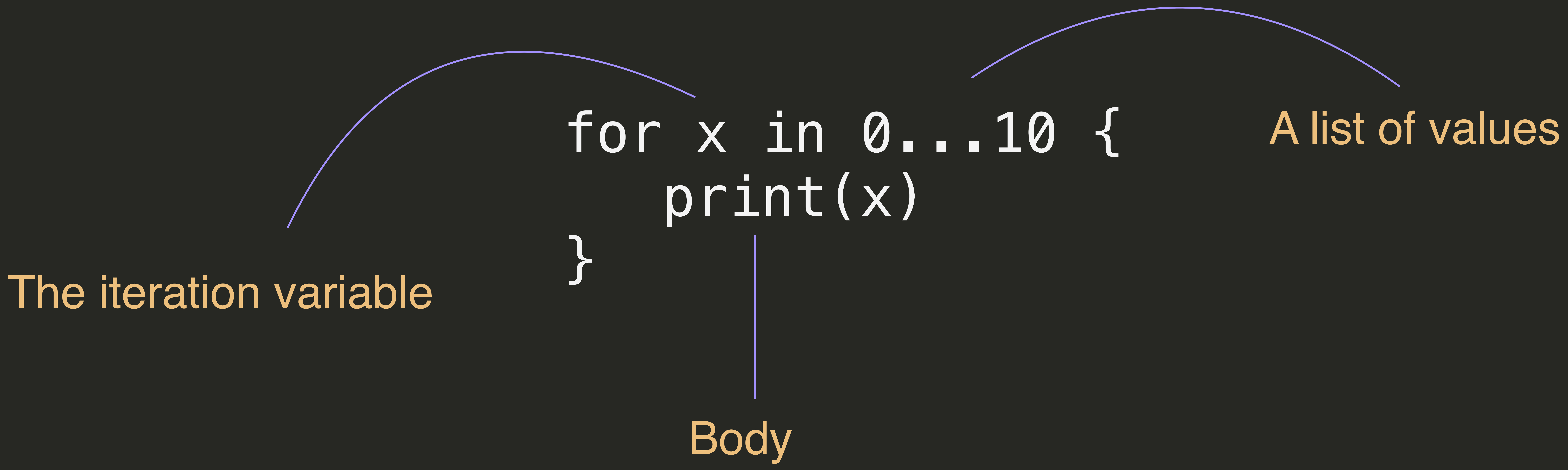
Parts of a For Loop

```
for x in 0...10 {
    print(x)
}
```

The iteration variable

Body

Parts of a For Loop



```
for x in 0...10 {
    print(x)
}
```

The iteration variable

A list of values

Body

Example: Iterating With Indices

- `0...3` includes the last number
  - 0, 1, 2, 3
- `0..<3` does **not** include the last number
  - 0, 1, 2

```
let array1 = [5, 7, 2]
for i in 0..<array1.count {
   print(array1[i])
}
```

Example: Iterating Without Indices

```
let array1 = [5, 7, 2]
for x in array {
   print(x)
}
```

When to Use For Loops vs. While Loops

For Loops vs. While Loops

- Use for loops to iterate over arrays
- Use for loops when the number of code repetitions is fixed and clear
  - Examples: counting to 10, testing divisors of a number.
- Use while loops when the number of repetitions is not clear
  - Example: continue until we are within 0.001 of sqrt(x) (previous homework)