



# Boolean Expressions, If Statements, While Loops

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# Boolean Expressions

# Types So Far

- `Int` - Integer Numbers
- `Double` - Real Numbers
- `String` - Text

# Types So Far

- `Int` - Integer Numbers
- `Double` - Real Numbers
- `String` - Text
- `Bool` - True or False

# True and False Literals

```
1> let a = true
a: Bool = true
2> let b = false
b: Bool = false
3> print("Is the sky blue? \(a).")
Is the sky blue? true.
```

# Comparison

- All the types you know can be compared with == and !=

```
1> let isBroken = 0 == 1
```

```
isBroken: Bool = false
```

```
2> print("Is math broken? \(isBroken)")
```

```
Is math broken? false
```

```
3> let name = "Donald Pinckney"
```

```
name: String = "Donald Pinckney"
```

```
4> let isMuggle = name != "Harry Potter"
```

```
isMuggle: Bool = true
```

```
5> print("Are you a muggle? \(isMuggle)")
```

```
Are you a muggle? true
```

# Comparison

- All the types you know can also be compared with `<`, `<=`, `>=`, and `>`

```
1> let a = 2 * 2 * 2 * 2 * 2
```

```
a: Int = 32
```

```
2> let b = 5 * 5
```

```
b: Int = 25
```

```
3> print("Is 2^5 bigger than 5^2? \ (a > b)")
```

```
Is 2^5 bigger than 5^2? true
```



# And, Or, Not

- Boolean expressions can be combined with: &&, ||, !
- `a && b`
  - True only if a and b are true
- `a || b`
  - True if either a or b are true
- `!a`
  - True if a is false, and false if a is true

# And, Or

&&	true	
	false	
true	true	false
false	false	false

	true	
	false	
true	true	true
false	true	false

# And Example

```
1> let divBy9 = 180 % 9 == 0
divBy9: Bool = true
2> let divBy4 = 180 % 4 == 0
divBy4: Bool = true
3> print("Is 180 divisible by 36? \(divBy9 && divBy4)")
Is 180 divisible by 36? true
```



# If Statements - Decisions!

# If Statements

- Often you want different code to happen under different circumstances
- If statements let you have just some code happen for a **Bool** condition, and other code happen in other cases

# If Statements

```
let x = Double(readLine())!
```

```
if x % 2 == 0 {  
    print("x is even")  
} else {  
    print("x is odd")  
}
```

# If Statements

```
let x = Double(readLine())!
```

```
if x % 2 == 0 {  
    print("x is even")  
} else if x % 3 == 0 {  
    print("x is divisible by 3")  
} else {  
    print("x is odd, and not divisible by 3")  
}
```



# While Loops - Repeating Code



# While Loops

- Sometimes you don't know before hand how many times you need to repeat some code. Or sometimes it's just a lot of times
- Use a while loop to automate the repetition
- Repeats code "while" a **Bool** condition is true

# While Loops

```
var sum = 0

var i = 1
while i <= 100 {
    sum = sum + i
    i = i + 1
}
print(sum)
```