Swift Fundamentals IV
Classes Intro

CS112 Unit 5
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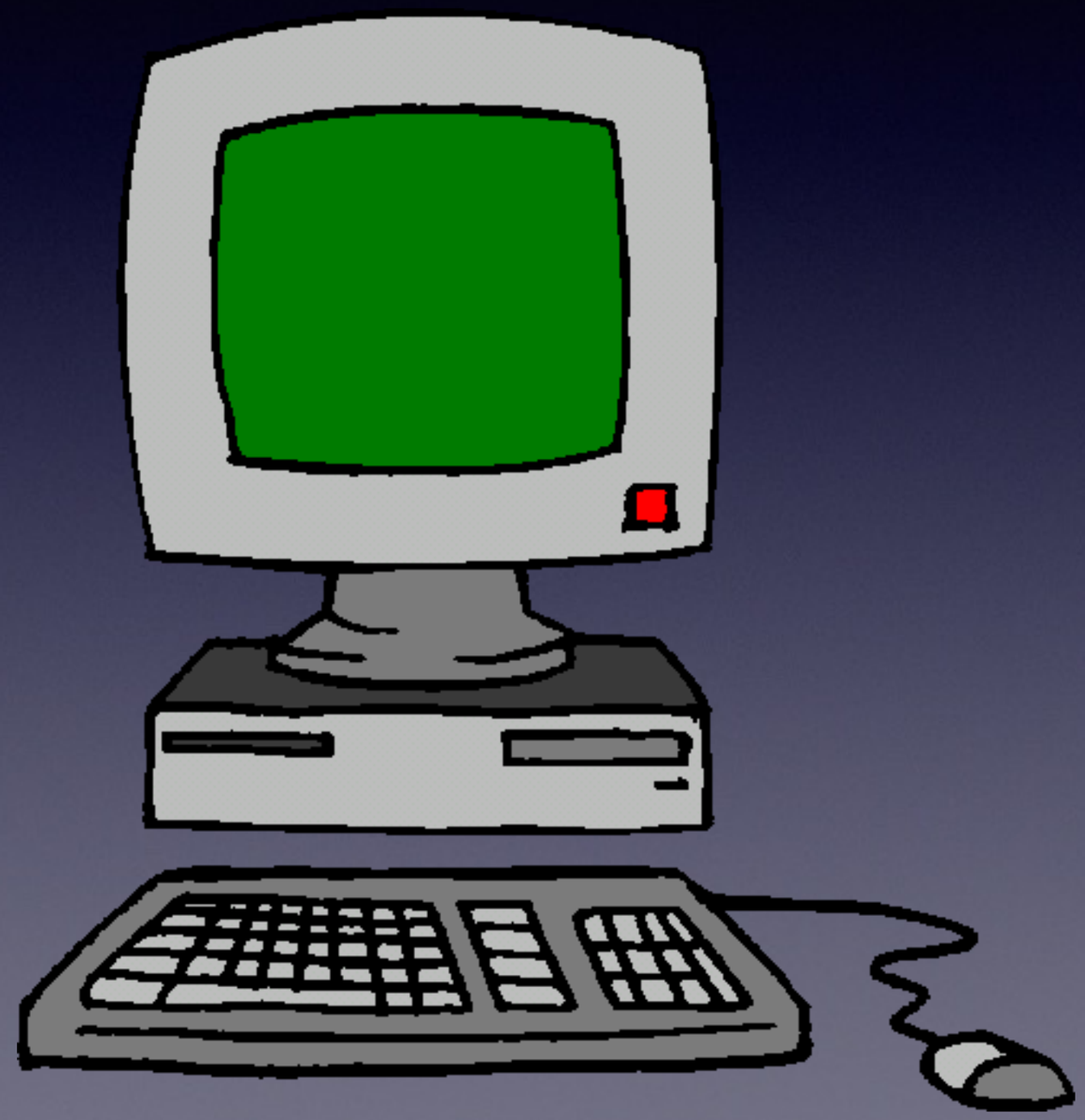
objects?

- A system can be thought of as a group of objects that interact with each other



classes and objects

- Swift allows us to bundle functions and data together by defining a **class**

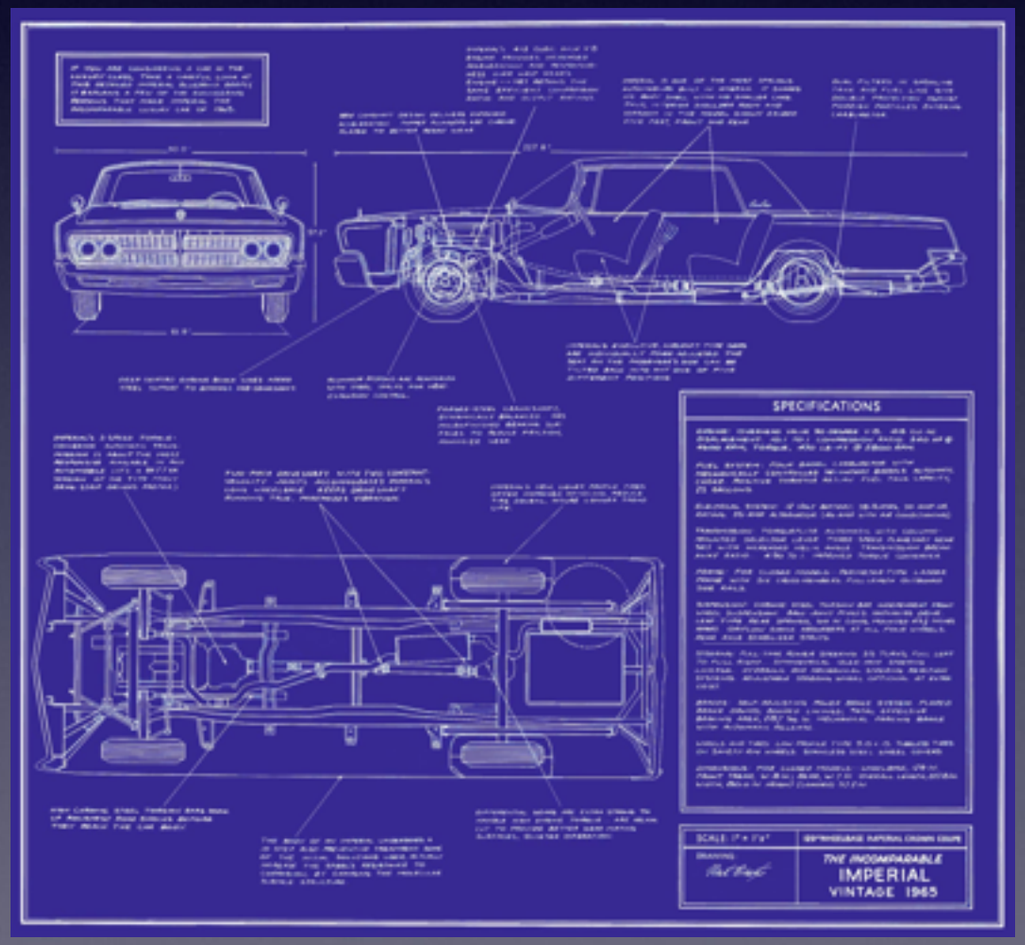
- Once we have defined a class, we can create **objects** of the class. This is known as instantiating an object of the class

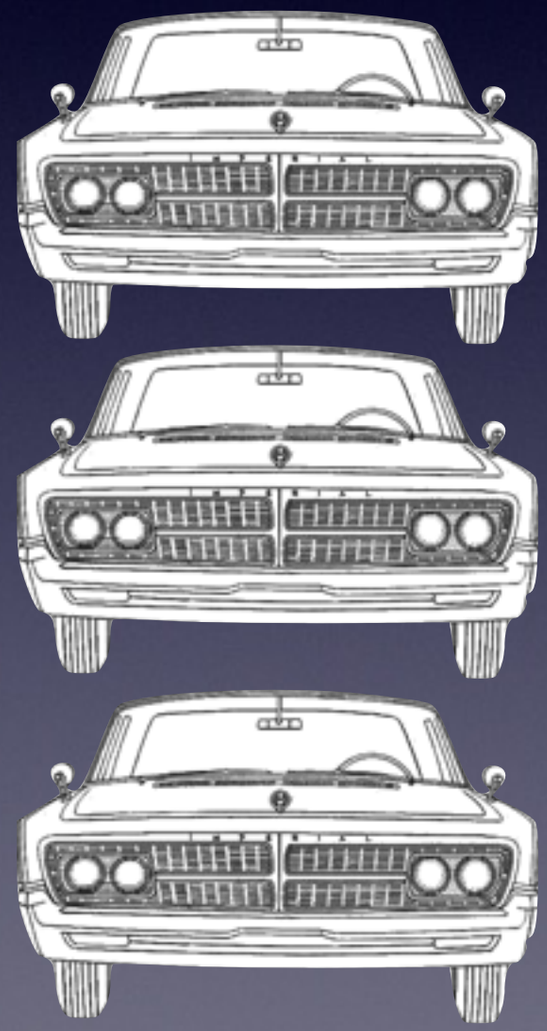
- A note on terminology — inside of a class:

    - functions are often called **methods** or member functions

    - data are often called **properties** or member data

class vs. object





abstraction, instantiation

car
make model currentSpeed fuelLevel startEngine() stopEngine() accelerate() brake() refuel()

***Abstraction**: distill the essential data and methods into a class*

honda
civic 35 12 startEngine() stopEngine() accelerate() brake() refuel()

vw
jetta 0 8 startEngine() stopEngine() accelerate() brake() refuel()

honda
civic 55 2 startEngine() stopEngine() accelerate() brake() refuel()

***Instantiatiation:** create **objects** from class*

class definition

- Bundle your data and functions together by defining a **class**. Here, we define a class for a rectangle

```
class Rectangle {
    var length = 0
    var width = 0
    func incrementWidth() {
        width += 1
    }
    func incrementLength() {
        length += 1
    }
}
```

instantiation

- here, we instantiate a Rectangle object and use it with the “dot” notation: **.**

```
class Rectangle {
    var length = 0
    var width = 0
    func incrementWidth() {
        width += 1
    }
    func incrementLength() {
        length += 1
    }
}
```

instantiating a rectangle object

dot notation

```
var bedroom = Rectangle()

bedroom.incrementWidth()
bedroom.incrementLength()
bedroom.incrementLength()
print("Length: \(bedroom.length), Width: \(bedroom.width)")
```

Sample Debug Output

```
Length: 2, Width: 1
```

more objects

- we can access an object's properties directly with "dot" notation

```
class Rectangle {
    var length = 0
    var width = 0
    func incrementWidth() {
        width += 1
    }
    func incrementLength() {
        length += 1
    }
}
```

```
var kitchen = Rectangle()
kitchen.length = 5
kitchen.width = 4
print("Length: \(bedroom.length), Width: \(bedroom.width)")
```

Sample Debug Output

Length: 5, Width: 4

more objects

```
class Rectangle {
    var length = 0
    var width = 0
    func incrementWidth() {
        width += 1
    }
    func incrementLength() {
        length += 1
    }
    func printInfo() {
        print("length: \(length), width: \(width)")
    }
}
```

```
var kitchen = Rectangle()
kitchen.length = 5
kitchen.width = 4
kitchen.printInfo()
```

Sample Debug Output

```
Length: 5, Width: 4
```

method returning a value

```
class Rectangle {
    var length = 0
    var width = 0
    func incrementWidth() {
        width += 1
    }
    func incrementLength() {
        length += 1
    }
    func printInfo() {
        print("length: \(length), width: \(width)")
    }
    func getArea() -> Int {
        return length*width
    }
}
```

```
var kitchen = Rectangle()
kitchen.length = 5
kitchen.width = 4
kitchen.printInfo()
print(kitchen.getArea())
```

Sample Debug Output

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Exercise 5A

- In a playground, define the Rectangle class as discussed today (you can just copy from the slide)
- Enhance the Rectangle class with two new methods:
    - getPerimeter() -> Int -- returns the perimeter of the Rectangle, i.e. 2*width+2*length
    - isSquare() -> Bool - returns true if the rectangle is a square, i.e. length is equal to width, returns false if not
- Demonstrate your class works by instantiating two Rectangle objects. One should be square and one should not be. Then print the output of your two new methods to the debug area