

iOS Bootcamp - Meeting 5

Hosted by App Team Carolina

Agenda

What can you expect this meeting?

1. Intro to JSON
2. Codable
3. JSON Decoding

Attendance!



Please fill this out!

Intro to JSON

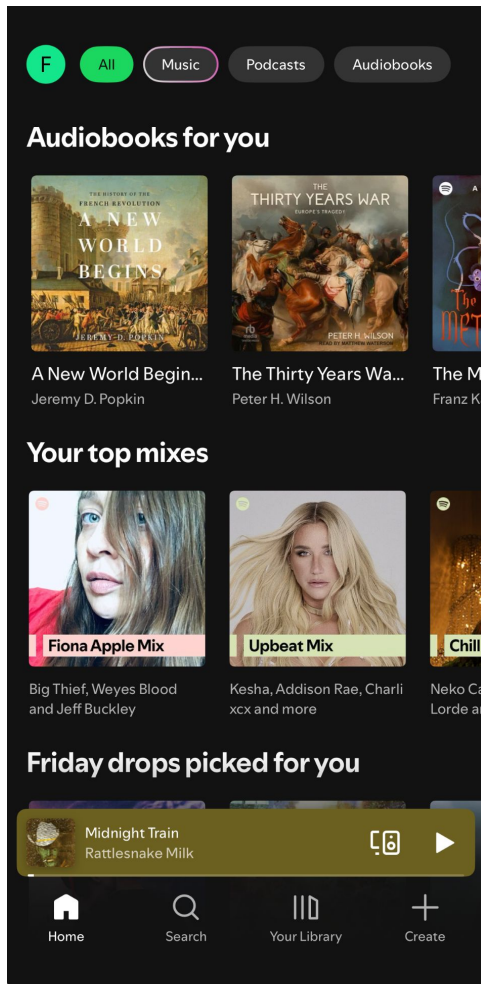
Intro to JSON

Where does data come from?

Think of your favorite app.

- Spotify shows the latest releases in music
- Instagram shows your friends' posts
- Weather apps show forecasts.

But where does this data come from?



Intro to JSON

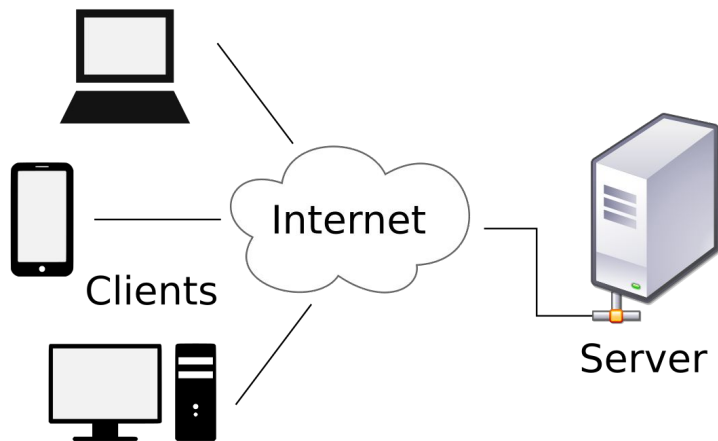
Apps fetch data from the web

How it works:

1. Clients request data from servers
2. Servers send data in a **structured format**

APIs (Application Programming Interfaces):

- The **bridge** connecting clients and servers
- Define *how* data is requested and shared
- Data usually transferred in **JSON format**



Client-server model, Wikipedia

Intro to JSON

What is JSON?

JavaScript Object Notation (JSON)

- Represents data as **key-value pairs** and **arrays**
- **Standardizes** how data is transmitted across the web

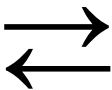
```
1  {  
2    "string": "Hi",  
3    "number": 2.5,  
4    "boolean": true,  
5    "null": null,  
6    "object": { "name": "Kyle", "age": 24 },  
7    "array": ["Hello", 5, false, null, { "key": "value", "number": 6 }],  
8    "arrayOfObjects": [  
9      { "name": "Jerry", "age": 28 },  
10     { "name": "Sally", "age": 26 }  
11  ]  
12 }
```

Intro to JSON

JSON in Swift

To send and retrieve data from the web using Swift, JSON objects are converted to and from **Swift structs!** How? Using the **Codable protocol**.

```
{  
  "title": "Party Rock Anthem",  
  "artist": "LMFAO",  
  "streams": 123456  
}
```



```
struct Song: Codable {  
  let title: String  
  let artist: String  
  let streams: Int  
}
```

Codable

Codable

Protocols

What is a protocol:

- Defines the *blueprint* of **required** behaviors or attributes
- It tells conforming types **what they must do**, not *how* to do it; an Interface
- **Structs, Classes**, and **enums** can conform to one or more protocols

```
protocol Vehicle {  
    func ETA(for distance: Int) -> Int  
    func travel(distance: Int)  
}
```

Codable

Example

```
protocol Vehicle {  
    func ETA(for distance: Int) -> Int  
    func travel(distance: Int)  
}
```

```
struct Car: Vehicle {  
    func ETA(for distance: Int) -> Int {  
        return distance / 50  
    }  
  
    func travel(distance: Int) {  
        print("Traveling \((distance).")  
    }  
}
```

What built-in protocol have you used before?

Codable

What is Codable?

To use JSON data in our apps, we need to **decode** it into Swift structs. Luckily, Swift provides a protocol to do just that: **Codable**

Codable is a typealias (nickname) for two protocols:

- **Encodable:** Swift → JSON
- **Decodable:** JSON → Swift

Codable

Codable Protocol

For **Codable** to translate JSON into a Swift struct for you, three things are required:

1. All property **names** must match
2. All property **types** must match
3. All property types must **conform** to Codable

```
{  
  "title": "Party Rock Anthem",  
  "artist": "LMFAO",  
  "streams": 123456  
}
```

```
struct Song: Codable {  
    let title: Int  
    let artist: String  
    let streams: Int  
}
```

Does this struct conform to Codable?

Practice Codable structs

[Return to Notion](#)

JSON Decoding

JSON Decoding

Decoding Data

To decode data provided by an API, call **JSONDecoder().decode**, which takes two arguments:

1. A **type**: what the data will be decoded *into*
2. A **Data** object: the binary representation of the JSON

```
let decodedSong: Song = try! JSONDecoder().decode(Song.self, from: jsonData)
print(decodedSong.title) // Prints "Party Rock Anthem"
```

JSON Decoding

The Bundle

In Project 5, the JSON data you'll use is stored locally in your project folder – not retrieved from the web. To access this file, we use the **Bundle**.

```
// Fetches the URL of data.json
let url: URL = Bundle.main.url(forResource: "song", withExtension: "json")!

// Tries converting the contents of data.json into a Data object
let jsonData = try! Data(contentsOf: url)
```

A bundle is a **container** that stores your app's resources. It lets you access these resources **without hardcoding file paths** such as */Users/AppleTeam/Project5/song.json*

Practice JSON decoding

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