Unit 5—Lesson 6: Working with the Web: Concurrency

Concurrency

Run multiple tasks at the same time

Run slow or expensive tasks in the background

Free the main thread so it responds to the UI

Synchronous and asynchronous

Synchronous

- One task completes before another begins
- Ties up the main thread (main queue)

Asynchronous

- Multiple tasks run simultaneously on multiple threads (concurrency)
- Tasks run in the background thread (background queue)
- Frees up the main thread

Grand Central Dispatch

Allows your app to execute multiple tasks concurrently on multiple threads

Assigns tasks to "dispatch queues" and assigns priority

Controls when your code is executed

Grand Central Dispatch

Queues

- Main queue
  - Created when an app launches
  - Highest priority
  - Used to update the UI and respond quickly to user input
- Background queues
  - Lower-priority
  - Used to run long-running operations

Dispatch queue

Use the `DispatchQueue` type to create and assign tasks to different queues

For example

- Assign a UI task to the `main` dispatch queue
- Tasks added with `main.async(…)` run sequentially

```
DispatchQueue.main.async {
    //Code here will be executed on the main queue
}
```

App Transport Security (ATS)

ATS improves user security and privacy

Requires apps to use secure network connections over HTTPS

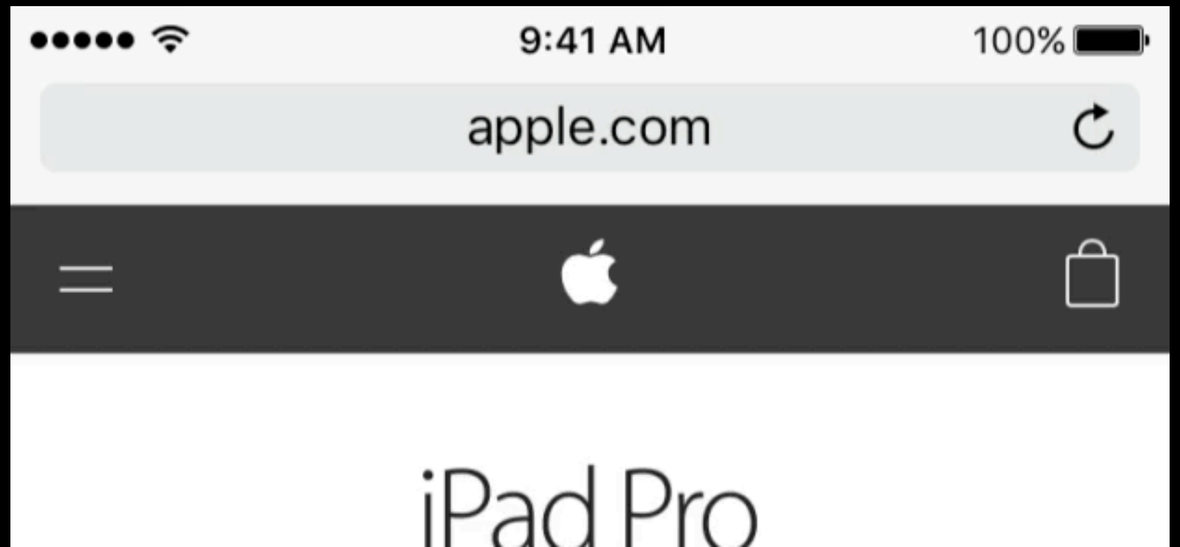
```
extension URL {
  func withHTTPS() -> URL? {
      var components = URLComponents(url: self, resolvingAgainstBaseURL: true)
      components?.scheme = "https"

      return components?.url
  }
}
```

Network activity indicator

Shows that your app is executing a network request and waiting for a response

```
UIApplication.shared.isNetworkActivityIndicatorVisible = true
```

Default is `false`



Unit 5—Lesson 7

Working with the Web: Concurrency

Learn about the concurrency system in iOS and how to make sure code that updates the user interface is executed in the right place.

Unit 5—Lesson 6
Lab: iTunes Search (Part 3)

Integrate your iTunes Search network requests into an app

Apply the lessons you've learned about concurrency to the project

Create an app that will allow the user to search for different media types and view the results in a table view

Learn how to update the size of the URL cache to temporarily save images