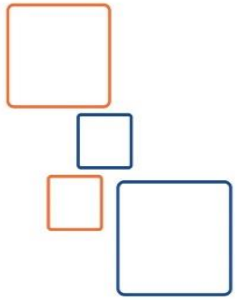
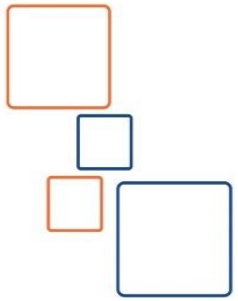
# iOS Using Objective-C



Presented By
Esraa Eid Hassan


Invest In Yourself,
Develop Your Career

# Lecture 1



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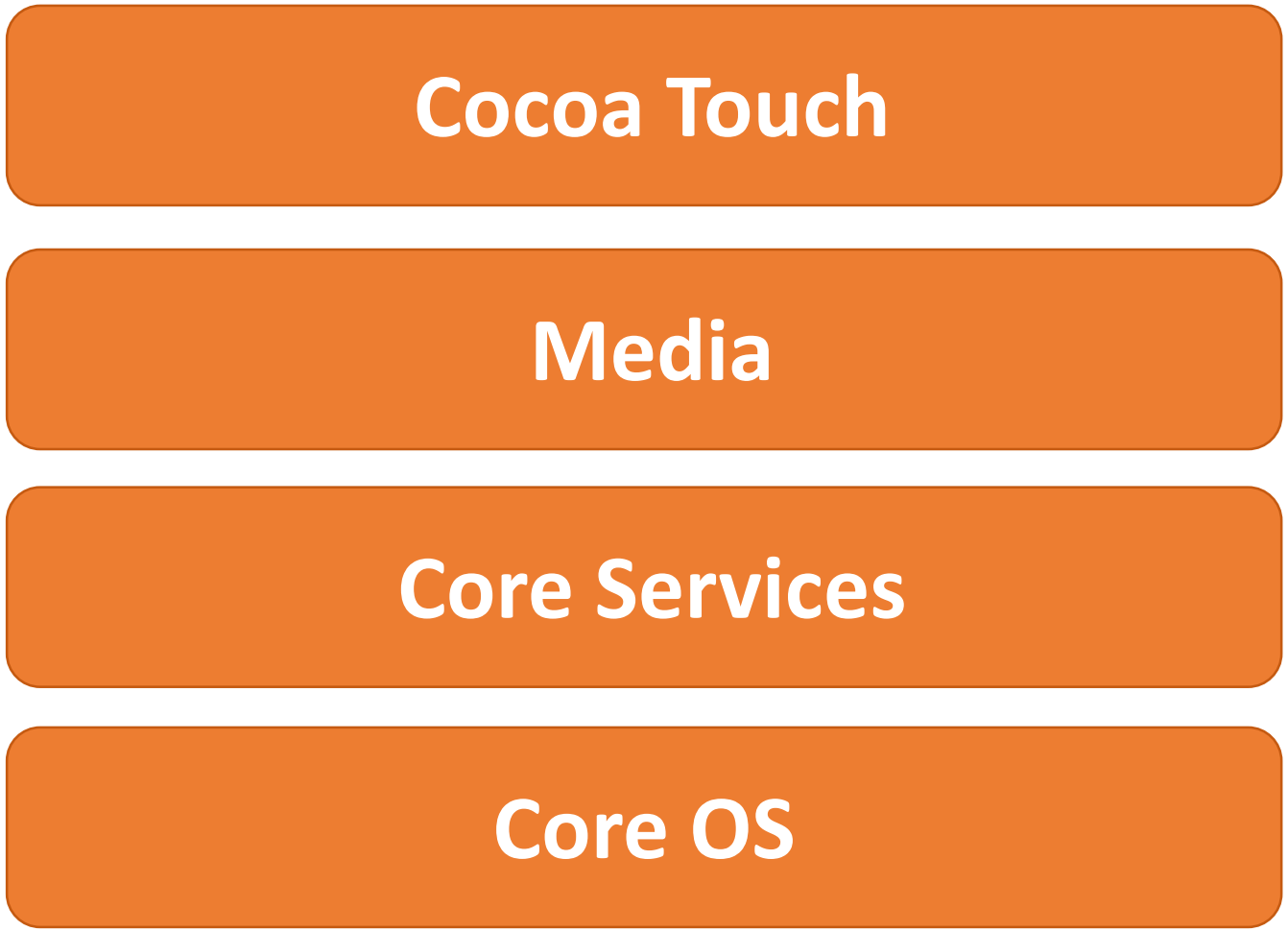
# Agenda

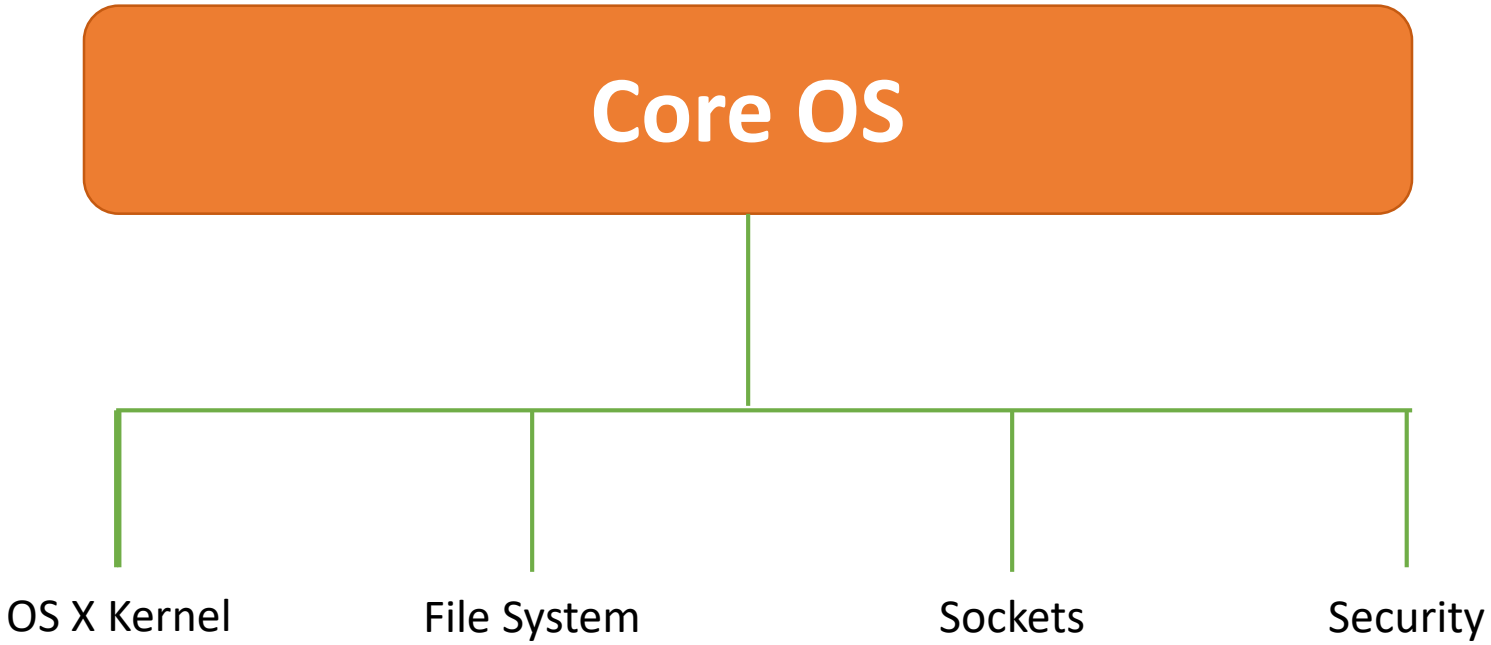
- iOS Application Architecture.
- Model View Controller (MVC).
- iOS Project Structure and Design.
- Application States.
- Life Cycle.
- IBOutlets and IBActions.
- Attributes of @property

# iOS Application Architecture

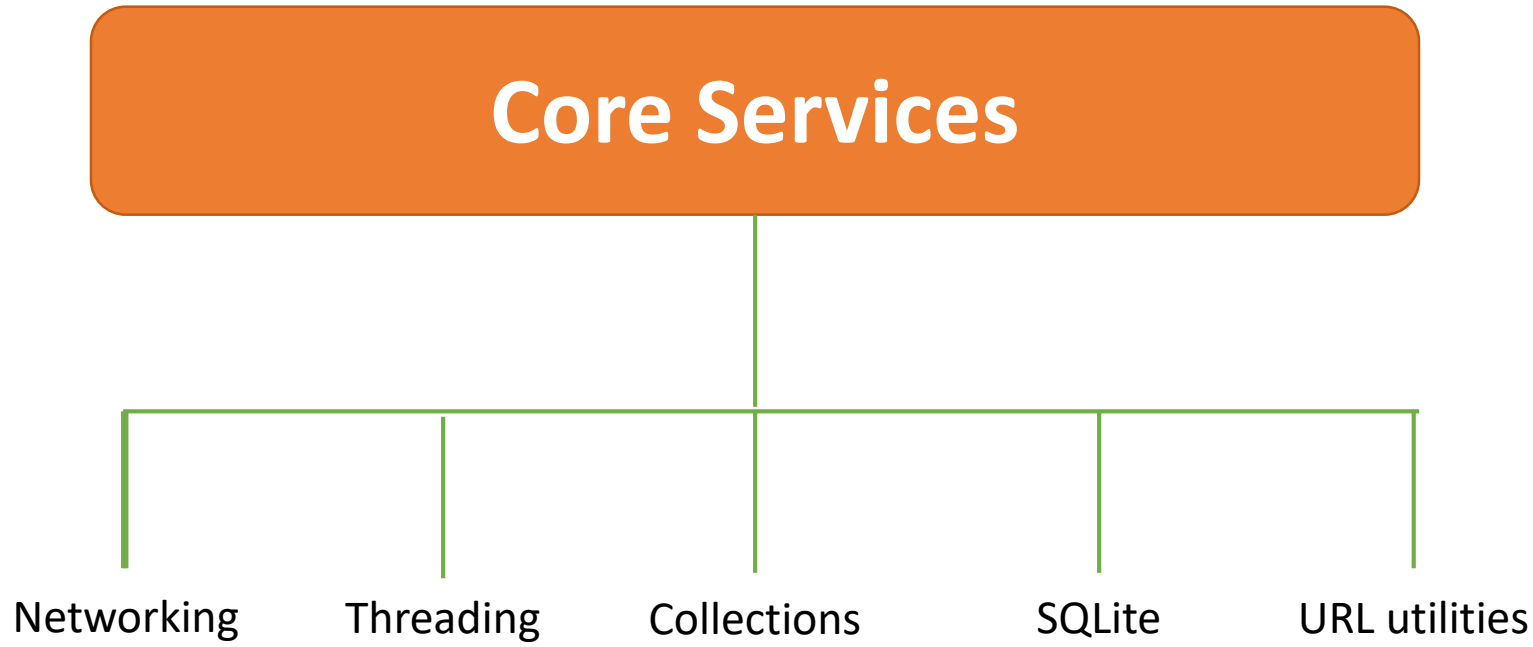
# Architecture



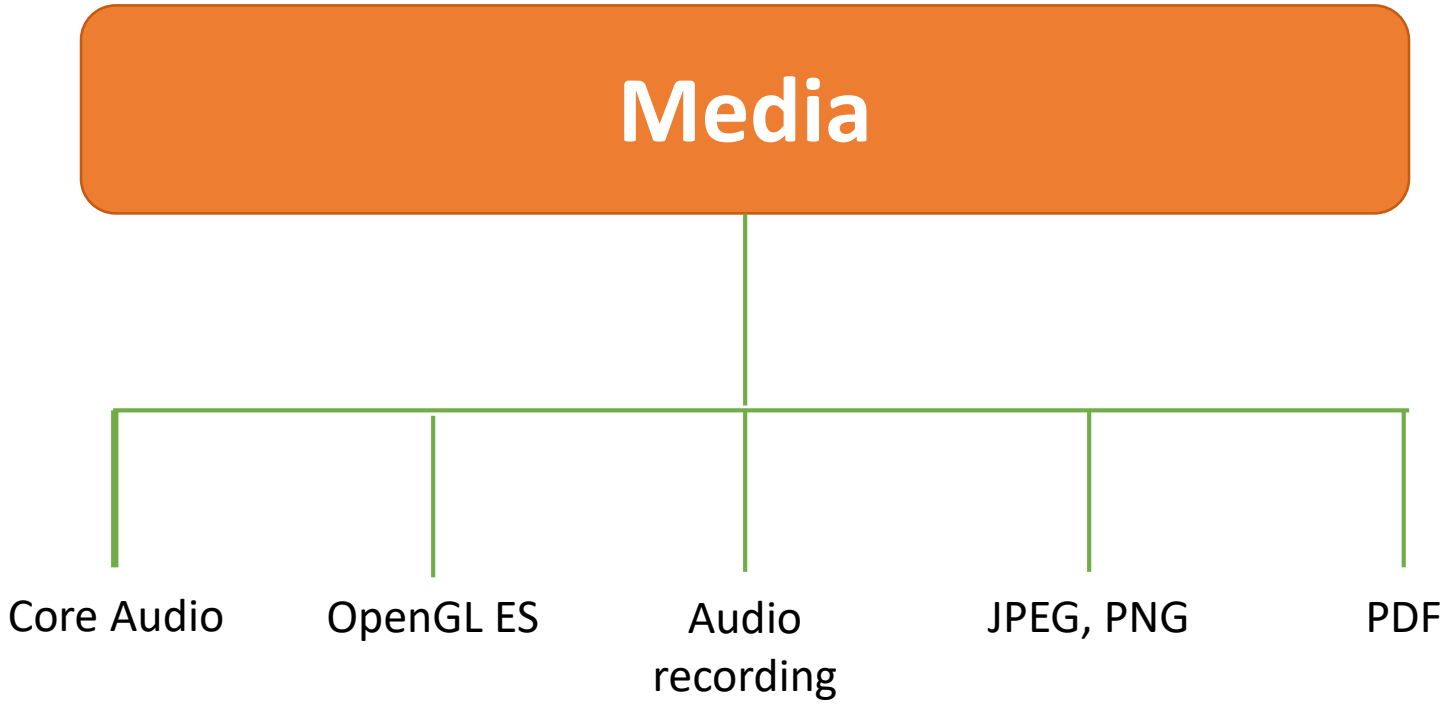
# Core OS



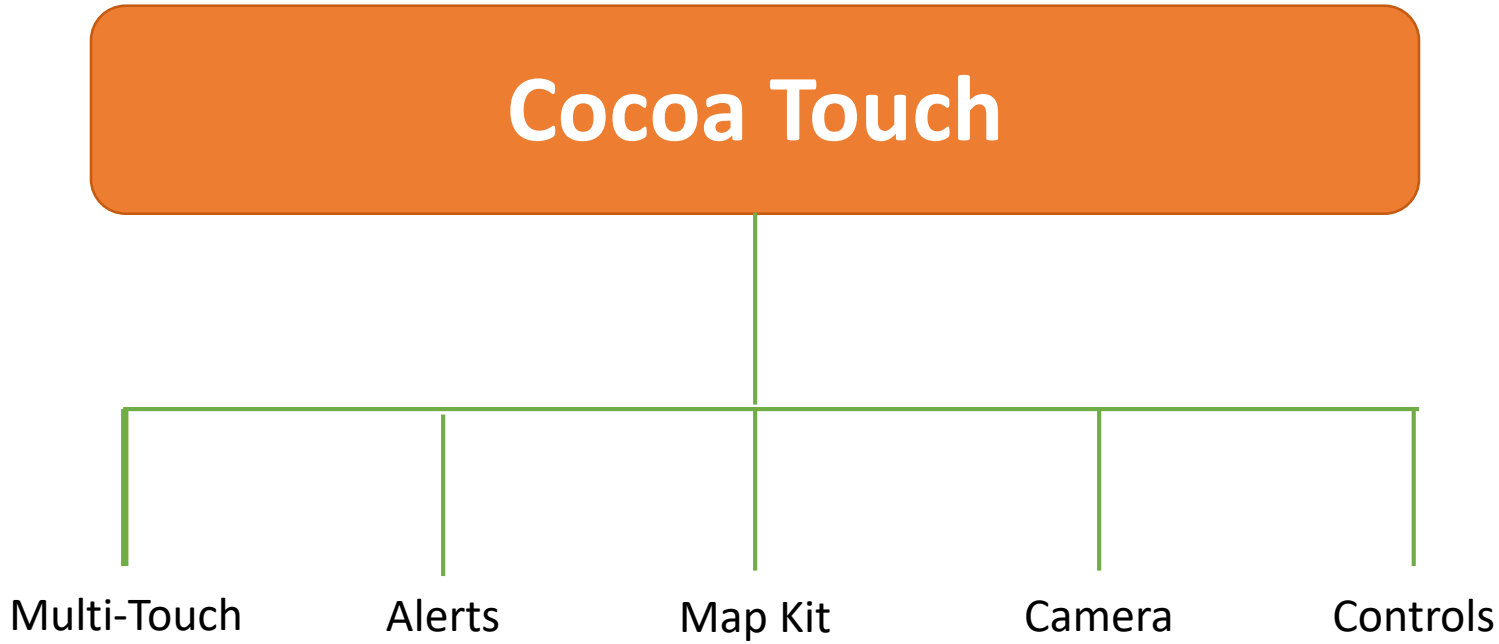
# Core Services



# Media



# Cocoa Touch



# Model View Controller (MVC)

# MVC

- It gives you the ability to change business rules without affecting GUI
- Also GUI could be changed without affecting business

# Model

- What your application do
- It’s not connected directly to the UI
- Many different UIs could have the same model

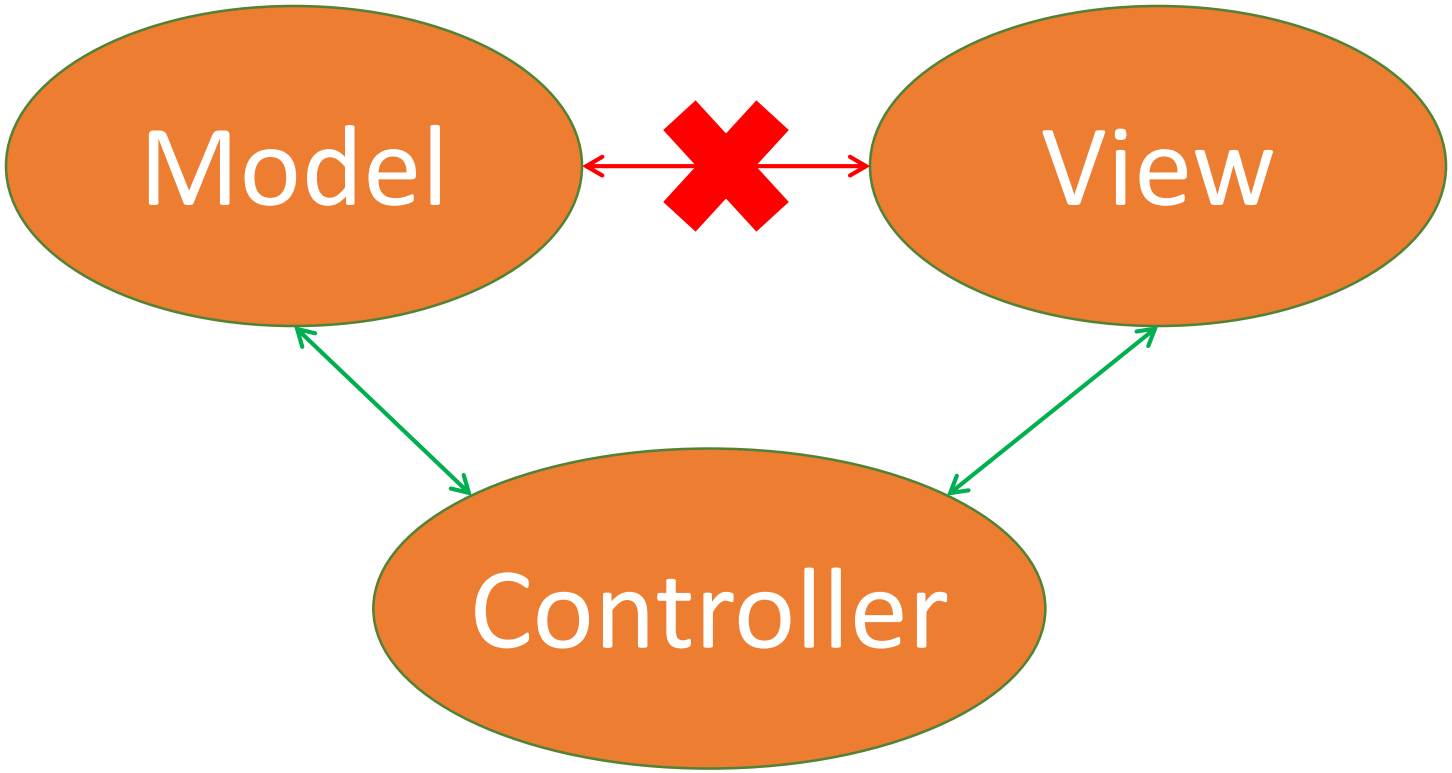
# View

- The representation of the application to the user
- Should not hold any data
- Enables the user to interact with data

# Controller

- It is the communicator between the model and view
- Updates model when view requires
- Updates view when model changes

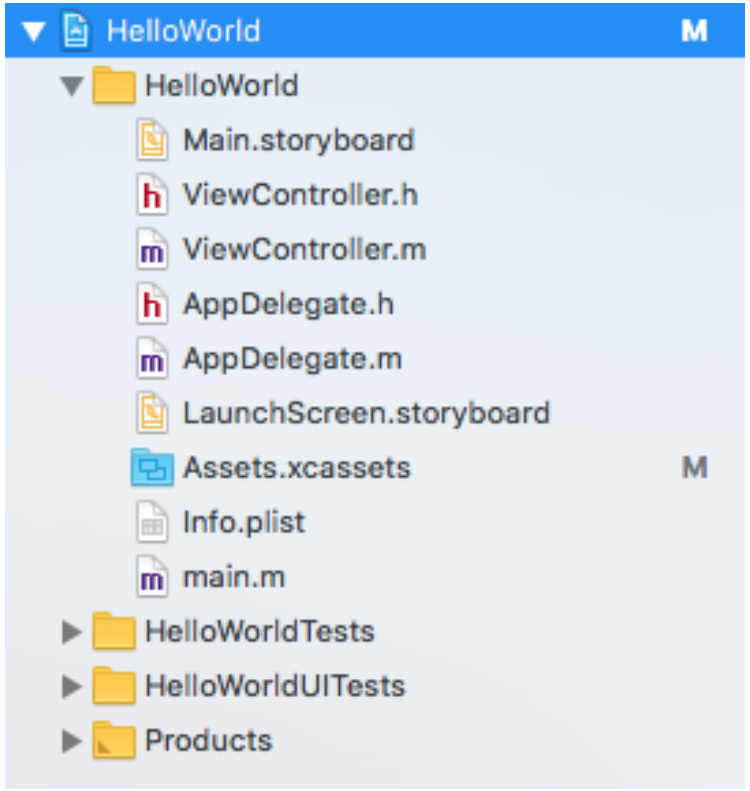
# Intercommunications



# Hello World Demo

# iOS Project Structure and Design

# Main Files


HelloWorld
M
HelloWorld
Main.storyboard
ViewController.h
ViewController.m
AppDelegate.h
AppDelegate.m
LaunchScreen.storyboard
Assets.xcassets
M
Info.plist
main.m
HelloWorldTests
HelloWorldUITests
Products

# Main Files

- Main.storyboard
- ViewController.h
- ViewController.m
- AppDelegate.h
- AppDelegate.m
- LaunchScreen.storyboard

# Main.storyboard

- It’s used to build your application’s user interface (View in MVC) using drag and drop
- No code is needed to build the user interface
- It’s created by the IB
- Interface Builder (IB) was an associated application with XCode 3.2, while in XCode 4 it’s one of its features
- It generates events automatically during runtime which will be sent to the associated method on the ViewController

# Main Files

- Main.storyboard
- ViewController.h
- ViewController.m
- AppDelegate.h
- AppDelegate.m
- LaunchScreen.storyboard

# ViewController

- It acts as the controller in the MVC model (Communicates between Model and View)
- A view controller manages a set of views that make up a portion of your application's user interface.
- It contains:
  - Reference of each view component (outlet)
  - An action for each event

# Main Files

- Main.storyboard
- ViewController.h
- ViewController.m
- AppDelegate.h
- AppDelegate.m
- LaunchScreen.storyboard

# AppDelegate

- It’s the core class in the application
- It’s auto generated in the application
- Every iOS application must contain only one application delegate
- It’s the class that represents your application to the iOS (interface)

# AppDelegate Cont.

- It contains the main methods that can be invoked by the iOS to your application
- It’s responsible for handling critical system messages such as: applicationDidFinishLaunching method.

# Main Files

- Main.storyboard
- ViewController.h
- ViewController.m
- AppDelegate.h
- AppDelegate.m
- LaunchScreen.storyboard

# Launchscreen.stroyboard

- A launch screen appears instantly when your app starts up.
- The launch screen is quickly replaced with the first screen of your app, giving the impression that your app is fast and responsive.

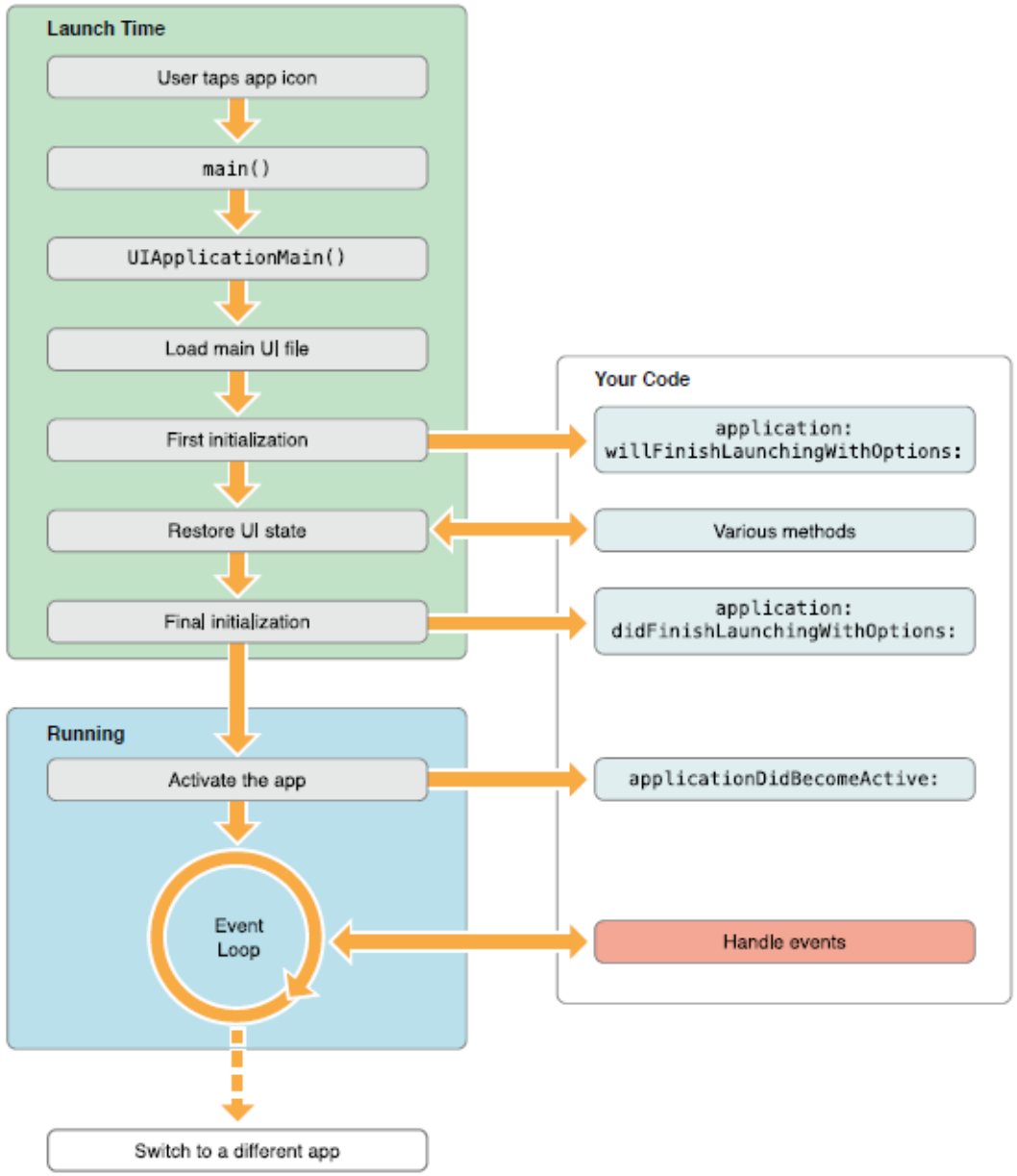
# Application States

# Application States

| State | Description |
| --- | --- |
| Not Running | The app has not been launched or was running but was terminated by the system |
| Inactive | The app is running in the foreground but is currently not receiving events. (It may be executing other code though.) An app usually stays in this state only briefly as it transitions to a different state |
| Active | The app is running in the foreground and is receiving events. This is the normal mode for foreground apps |
| Background | The app is in the background and executing code. Most apps enter this state briefly on their way to being suspended. However, an app that requests extra execution time may remain in this state for a period of time |
| Suspended | The app is in the background but is not executing code. The system moves apps to this state automatically and does not notify them before doing so. While suspended, an app remains in memory but does not execute any code |

# Life Cycle

# Life Cycle


Launch Time
User taps app icon
main()
UIApplicationMain()
Load main UI file
First initialization
Restore UI state
Final initialization
Running
Activate the app
Event Loop
Switch to a different app
Your Code
application: willFinishLaunchingWithOptions:
Various methods
application: didFinishLaunchingWithOptions:
applicationDidBecomeActive:
Handle events

# Life Cycle Cont.

```
int main(int argc, char *argv[])
{
    @autoreleasepool {
        return UIApplicationMain(argc, argv, nil, NSStringFromClass([JETSAppDelegate class]));
    }
}
```

# Life Cycle Cont.

- The AppDelegate methods

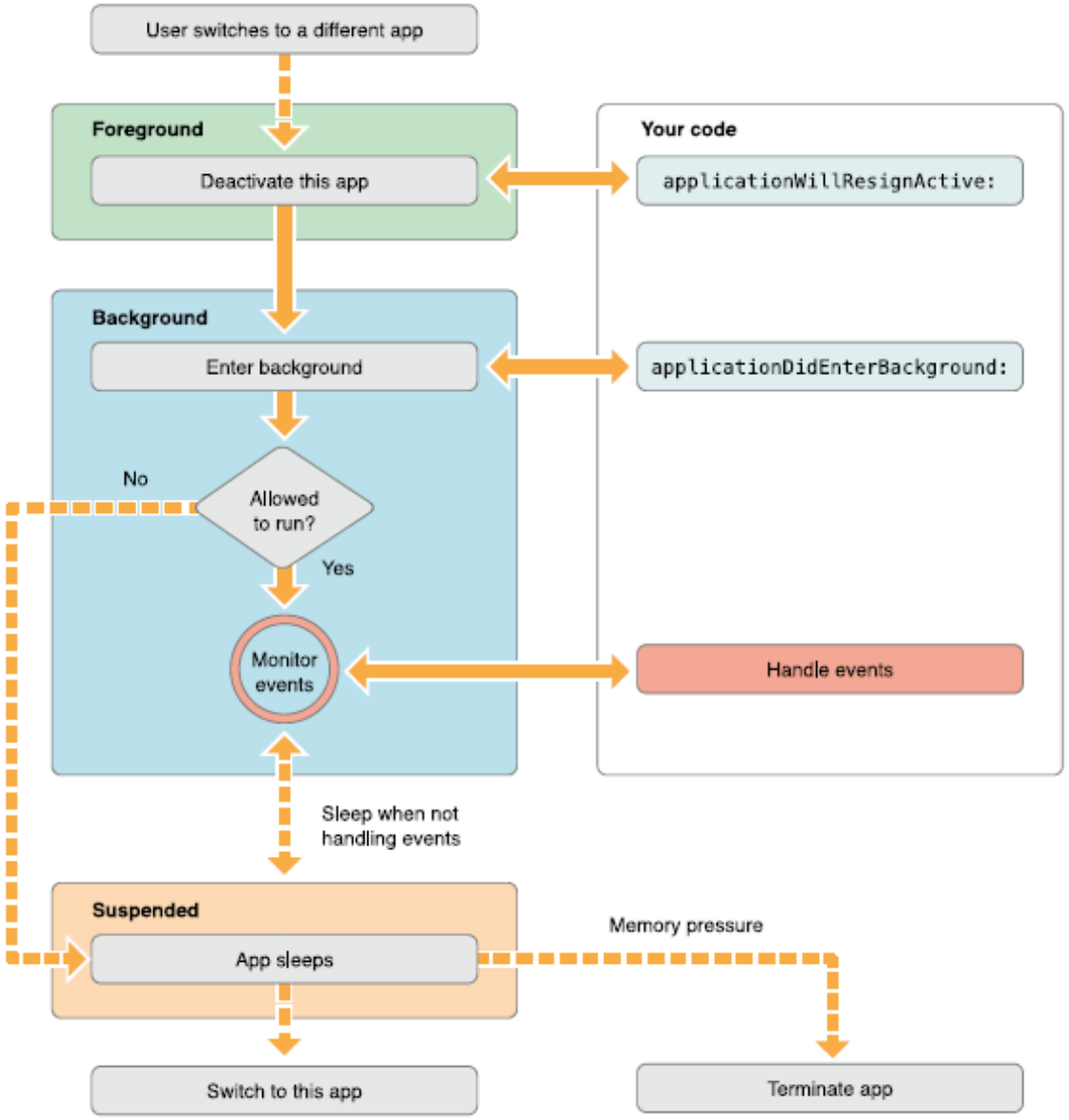
  application: willFinishLaunchingWithOptions:

  application: didFinishLaunchingWithOptions:

  are used to:

  - Initialize the application's critical data structures.
  - Prepare your application's window and views for display.

# Life Cycle Cont.



# Life Cycle Cont.

- The AppDelegate methods

  applicationDidEnterBackground:

  is used to prepare for moving to the background state:

  - Prepare to have their picture taken
  - Save user data and app state information.

# Life Cycle Demo

# IBOutlets and IBActions

# IBOutlet

- It is used to identify that this element should appear in the interface builder for LINKING with some elements

- You don’t have to define all the GUI components as IBOutlets, you have to define components that you need to access for read or write

# IBAction

- It is used to identify that this method is a call back method, called by the system upon GUI event.
- It makes this method appear in the interface builder for LINKING with some events
- You define only GUI event actions methods as IBAction
- IBAction method can serve more than an event

# Call Back Methods

- Methods created by the developer and called by the system upon certain events
- Call back methods are used in iOS development much
- They are used in IBActions and delegate methods

# IBOutlet and IBAction Demo

# Attributes of @property

- **List of attributes of @property :**
  - atomic.
  - nonatomic.
  - retain.
  - copy.
  - readonly.
  - readwrite.
  - strong.

# atomic

- **atomic :**
  - It is the default behaviour.
  - If an object is declared as atomic then it becomes thread-safe.
  - Thread-safe means, at a time only one thread of a particular instance of that class can have the control over that object.

# nonatomic

- **nonatomic:**
  - It is not thread-safe.
  - You can use the nonatomic property attribute to specify that synthesized accessors simply set or return a value directly, with no guarantees about what happens if that same value is accessed simultaneously from different threads.
  - For this reason, it’s faster to access a nonatomic property than an atomic one.

# retain

- **retain:**
  - is required when the attribute is a pointer to an object.
  - The setter method will increase retain count of the object, so that it will occupy memory in autorelease pool.

# copy

- **copy:**
  - If you use copy, you can't use retain.
  - Using copy instance of the class will contain its own copy.

# readonly

- **readonly:**
  - If you don't want to allow the property to be changed via setter method, you can declare the property readonly.

# readwrite

- **readwrite:**
  - Is the default behaviour.
  - You don't need to specify readwrite attribute explicitly.

# strong

- **strong:**
  - is a replacement for retain.

# Lab Exercise

# 1.Hello World

- Create Hello World application with Button and Label that shows Hello World message when you press the button.

# 2.Life Cycle

- Use AppDelegate methods to view the life cycle of your application.

# 3.Copying Text

- Create an application with Button ,text field and label that shows the entered text in the text field on the label.

# 4.Your Colleagues

- Create an application that switches between your adjacent colleagues names using Next and Previous buttons.

- Make it cyclic.

# 5.Validation

- Create an application to validate whether the user’s input is text or number using two buttons

# 6.Simple Calculator

- Create a simple calculator to perform the basic operations (addition, subtraction, multiplication, division)