How Are Apps Made?

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Outline

- **Integrated Development Environments assemble different development tools which simplify and expedite software development.**
- **Software Development Kits compile and give developers access to different APIs which provide necessary data for the application.**
- **Frameworks hasten the development process by giving you a foundation of libraries which provide shortcuts around tedious code.**
- **Debugging is the process of running and examining your code to find and fix broken code.**
- **Version Control allows you to document all changes made to your code, giving transparency to all work done to your project.**
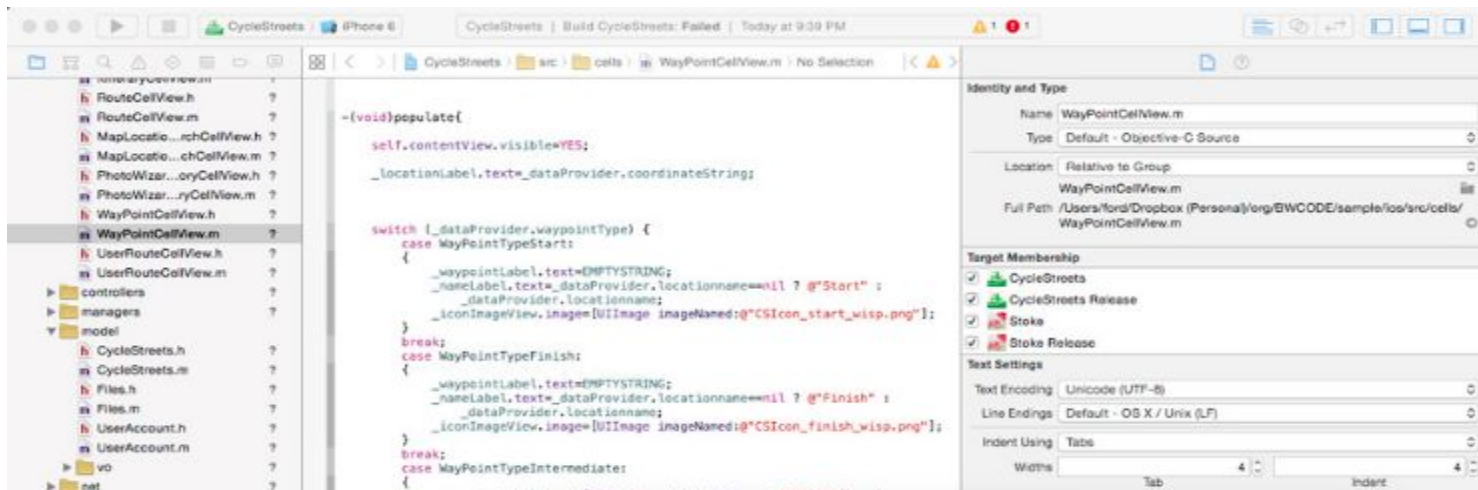
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Integrated Development Environments (IDE)

- **IDEs are application software, which provide helpful facilities for programmers when they are developing their own software.**
- **Usually, IDE's contain a source code editor, build automation tools, and a debugger.**
- **Xcode is Apple's IDE and is used for creating applications on the Mac, iPhone, and iPad.**

Xcode Environment

- **Xcode is a huge download with more than two gigabytes of data. It's a user friendly place designed to help the programmer keep track of their files, code, and ultimately, their program.**

https://www.bloomberg.com/graphics/2015-paul-ford-what-is-code/#how-are-apps-made

IDE Components

- **A source code editor allows you to edit the code for creating programs.**
- **Build automation tools allow for the process of automating the creation of a software build.**
- **A debugger is a program that sifts through your code, warning you of possible errors which could lead to a crash.**
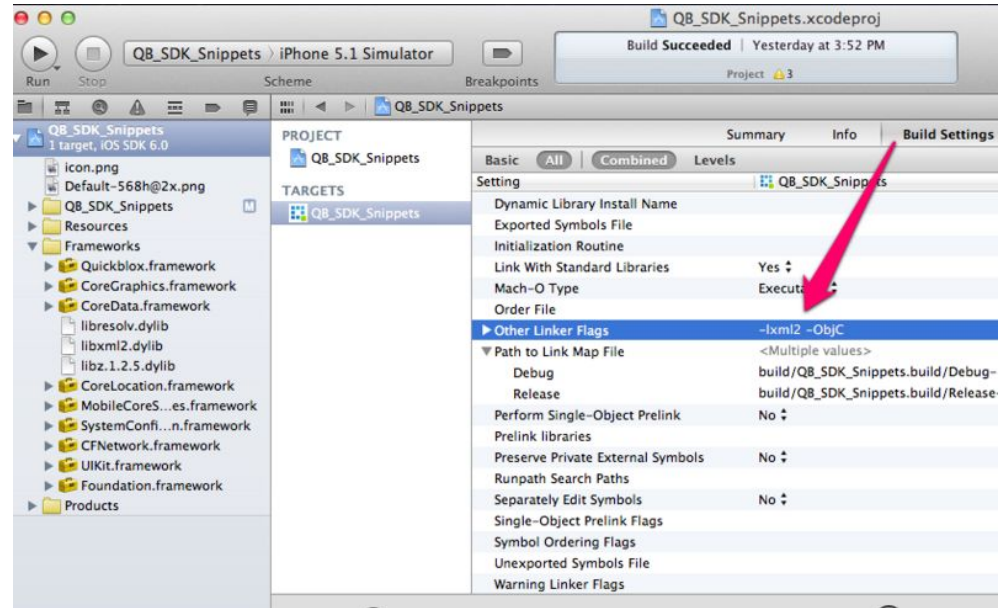
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Software Development Kit (SDK)

- **An SDK compiles and gives developers access to different APIs which provide necessary data for the application.**
- **These APIs give developers a selection of tools made for creating software.**
- **Software designed to create software is usually free because it stimulates the creation of more software.**
- **The iOS SDK is used for making iPhone and iPad apps and is made up of dozens and dozens of APIs.**

iOS Software Development Kit

● **This environment helps programmers keep track of their many files which will ultimately become their application.**

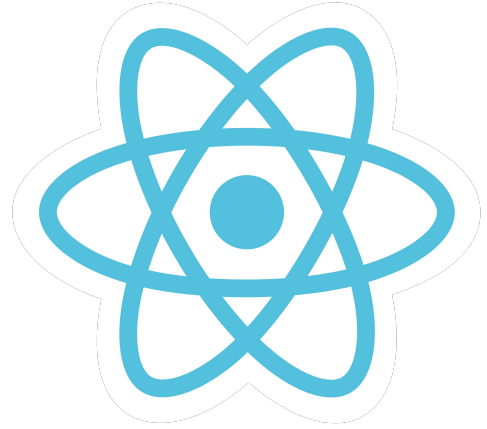http://www.writeopinions.com/ios-sdk

Do I Have Everything?

- **StyleTap is another SDK that allows you to use apps written as iOS applications**
- **All of these things allow for the creation of applications**

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Frameworks

There are hundreds of frameworks to choose from, each unique in their approach to simplifying your code process.

Handles the tedious parts of coding

- **Saves you time in your development.**
- **Avoids the pain of writing the same code over and over again- keep your code DRY.**
- **Just about every language has a framework**
- **Frameworks are usually specific to one type of application.**
  - **Graphics framework, web framework, network framework, etc.**

django, a Python Web framework

- **When you start a new project, you type "startproject"**
  - **Makes a project directory with some files and configurations, which give you access to libraries and services.**
- **Uses the idea of models:**

```python
from django.db import models

class Book(models.Model):
    title = models.CharField(max_length=140)
    description = models.TextField()
    price = models.DecimalField(max_digits=6,decimal_places=2)
```

Models in django

Add book

| Title: | The Little Schemer |

Description: This is a very pleasant book about programming in Scheme. It includes room for "jelly stains."

Price: 33.00

Save and add another | Save and continue editing | Save

With just that model definition and few more lines of configuration, you can have this part of your website completely functional as shown above.

Downsides of Using Frameworks

- **They lock you into a way of thinking.**
  - Some well-trained eyes are able to just look at a website and know exactly which framework is was built on.
- **Some believe that frameworks make things too easy for the developer and become a crutch.**
- **Sometimes pay a price in speed and control for all of the convenience that is offered.**
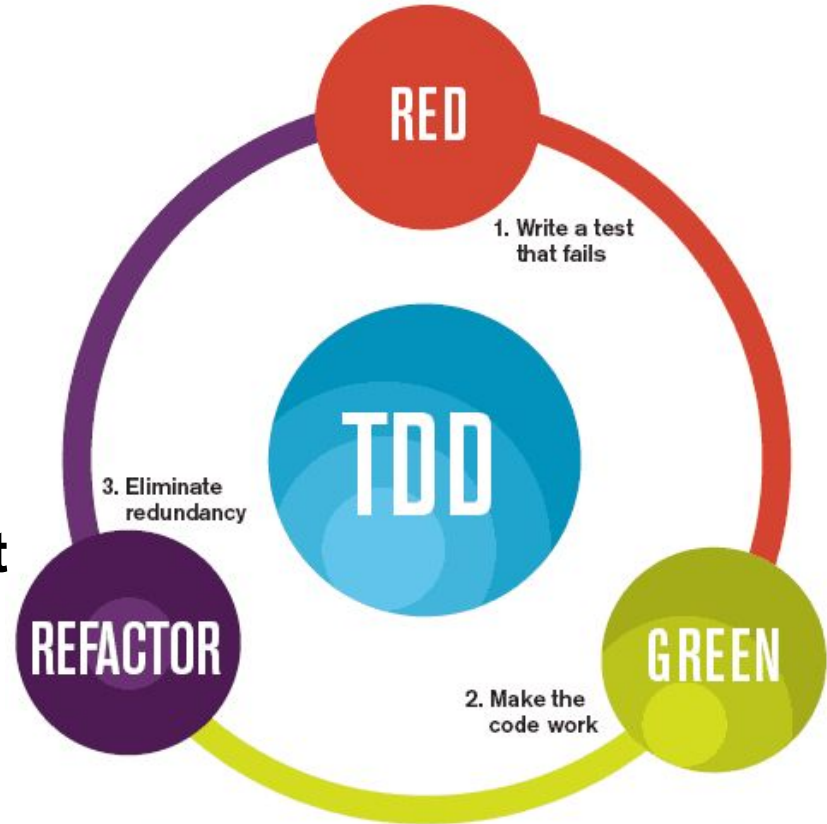
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Debugging

- **Debugging is the process of running and examining your code to find and fix the code that isn't working as intended.**
- **Many times this requires you to review your code line by line until you find what is causing the error.**
- **If you are a programmer, you will spend more time debugging than writing code. Even the article says "Programming is debugging" and that we should expect our code not to work.**

The World of Test Driven Development

- **This ideal world consists of programmers writing tests before the code to be tested.**
- **Tests are just code snippets that check your other code.**
- **At the end of a coding session, you run tests so you can find out if your day's work broke anything.**

RED
1. Write a test that fails

TDD

3. Eliminate redundancy

REFACTOR

GREEN
2. Make the code work

The mantra of Test-Driven Development (TDD) is "red, green, refactor."

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Version Control is Beautiful

- **Record every change made to every document in your codebase and record who made them-transparency.**
- **Make "branches" of the codebase without affecting the integrity of the master branch.**
- **Any progress made on a branch can be merged into the master branch at any point.**
- **It's free!**

Everyone is Excited about Github

- **Github currently has a monopoly on the Version Control market.**
- **On Github you are able to look into any public repository and see how their code works.**
- **And if your heart desires, you may even download their code and change it however you like, without affecting their code.**

GRNsight on Github

For the repository that we will all be working on for the rest of the semester, anybody can go look at our code.

Why would I want to be that transparent?

- Transparency allows for Open Source defined software.
- By having everything on Github be public, people are encouraged to report bugs that they find in software and maybe even aid in the fixing of those bugs.
- None of your code is at risk, you have to personally accept any changes that are requested for the codebase.

Conclusion

- **There are many ways to aid programmers' development of software.**
- **These methods, practices, and tools allow for programmers to create programs faster and with higher quality.**

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