

Instructor: Mohammad Sadoghi
TAs: Sarmishta Burujupalli
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Due Date: January 19, 2019
Submission Method: Canvas
Score: 10%

Pre-Milestone Handout

ECS 165A

For the pre-milestone assignment, you are going to research and explore the various technologies involved in building an Instagram mobile application starting from the front-end to backend. This is the only individual assignment, in which you need to write a short summary (at least six pages long) of what technologies you would choose and why.

This handout offers a few suggested technologies to get you started. You are not limited to any of the technologies listed here. You have complete freedom.

*Think Long-term, Plan Carefully.
Be curious, Be creative!*

One way to start your exploration is through Google to learn about Instagram and related applications. Essentially, you need to research what it takes to build a mobile app. What are the key components that are necessary? Along the way, document all your findings and keep track of the sources of all materials. All materials below are merely suggestions to get you to start thinking.

You can read the [article](#) on about Instagram app, a retrospection. How it was built, The technologies used to implement it, the system design as a whole, etc. Here is another [article](#) on what powers the app.

There are many useful Quora questions and Reddit discussion groups that you could follow and get an idea of what other engineers think as well. Here is an [example](#).

Again, the main intention of this exercise is to explore different things and see what suits your needs as a developer, and what is the best way to approach it.

Next, begin exploring the different options for technology stack, below are few examples. You are suggested to read a few tutorials on each technology, and perhaps write your first "Hello World!" program in each environment to determine if it is right for you.

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Front-end Technologies:

React Native is a framework developed by Facebook. This framework allows you to create mobile applications identical to an application built using Swift or Java. The User Interface can be written in pure JavaScript and React.

Tutorials: [Link](#)

Android Studio is specifically designed for developing android based applications programmed using Java.

Reference Link: [Tutorial](#)

Swift is a programming language developed by Apple Inc. for developing applications for iOS, macOS etc.

Reference Link: [Tutorial](#)

Backend Databases

To store your data and efficiently retrieving and visualizing them on your UI (user interface), there are two modes of a database that you can use. You can use the *embedded database*, essentially shipping your database as part of the mobile application package or an *externally hosted database*, in which a database is hosted on the external server (or your laptop) and your mobile app connects to it. Once you determined the mode of your database engine. Then you can explore **SQL** (relational database with transactional capability) or **NoSQL** database (key-value store with limited transactional capability).

An [interesting read](#) on the most popular database engines for mobile apps.

SQLite is a software library (an embedded) that provides a relational database management system. The lite in SQLite means lightweight in terms of setup, database administration, and required resource. Note SQL is the standard language to communicate with relational databases (which you will learn in the class). [\[Tutorial\]](#)

Firebase is a platform (externally hosted) which allows building web and mobile apps. You can store user's data on its real-time database which sync data among users data in no time. It is owned by Google and is easy to Integrate into your project.

[\[Firebase-console, Intro Video\]](#)

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Forming Team and Finalizing Roles

As part of this milestone, you need to form your group, including the name of all members and fill up the [Google Form](#). If you are looking for partners when filling up the Google form please choose the option to be paired up.

Additionally, you need to specify the role of each member. For each group, it is important that each member lead one aspect of the project while contributing and learning about other parts. There are four lead roles that must be assigned (1) front-end, UI, and data visualization, (2) app logic and data aggregation/querying, (3) data model and indexing, and (4) database management and tuning. Please specify the role of each member.

Late Policy

There will be a 10% penalty for each late day. After three late days, the homework will not be accepted.

Course Policy

In this class, we adopt the UC Davis Code of Academic Conduct available [here](#).