_____

Milestone 3: Demonstrating Core Functionalities
ECS 165A - Winter 2019

In the second milestone assignment, you gained a working knowledge of how to create a basic mobile app. More importantly, you had the opportunity to design your frontend (careful examination of UX and UI elements) and the backend design (ER model mapping to complete database design). By the end of the second milestone, you ought to have at least two basic functionalities such as user authentication, user profile management, and/or the ability to follow/unfollow other users. Building upon the last milestone, the main objective of this phase is the ability to both generate and consume social data. You need to create at least three complete data-driven features for social data navigation and analysis, of course, you are not limited to these suggestions and any other creative ideas are welcome and encouraged. **(S1)** Creating and retrieving the posts on the user's profile timeline, **(S2)** Implementing a search feature based on usernames to search user profiles **(S3)** Developing an algorithm to retrieve and maintain up-to-date activity feed from the database.

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

(S1) Creating and Retrieving Posts:

The goal of this stage is to develop a feature for post creation. The posts should be retrieved onto the user's profile page automatically. The user may create posts with/without hashtags.
Since it is an Instagram-like App, you may be dealing with uploading images, capturing images from the camera of the phone, and retrieving images associated with posts.

You need to pay attention to how your frontend and backend are integrated in order to achieve the desired functionalities. For example, in the 1-tier application design, the frontend, application logic, and backend all run on the mobile device; in the 2-tier design, the frontend and application logic run on the mobile device but the backend is hosted on a dedicated server or runs on the cloud; and finally, in the 3-tier design, the frontend runs on the mobile device, the application logic runs on external app server (perhaps hosted on the cloud), and the backend is also hosted on yet another a dedicated server or runs on the cloud.

Instructor: Mohammad Sadoghi   **Due Date:** February 26, 2019
TAs: Sarmishta Burujupalli   **Submission Method:** Canvas
              Giritheja Sreenivasulu   **Score:** 15%

_____

Here are several useful technology guides:
1. Needle in haystack : An article about the storage of Facebook Photos.
2. Uploading images using React: An article of simple React implementation for uploading with an emphasis on the frontend.
3. Image using react-redux-nodejs: An article describing an end-to-end implementation of Photo uploading website.
4. Send, store and retrieve images : An article describing an end-to-end implementation for uploading, storing, and retrieving photos.
5. Capturing pictures using React Native: An article explaining the native implementation which can be used to capture images from the camera.
6. Uploading images to Firebase: An article describing a React Native Firebase implementation to store images.

(S2) Implementing a search feature based on username

The second part of this milestone includes implementing a search feature that would show the user profile when the user enters a username as plain text. This feature is used to filter user profiles based on the username. The user would now be able to search for a profile and choose whether to follow/unfollow discovered users.

Here are a few useful resources:
1. In-app search: This article talks about a few design aspects of search.
2. What are the best practices for implementing an internal site search? This quora article has a few suggestions related to the implementation of the search feature.
3. Ten examples of well-designed search UIs
4. How to write a search component with suggestions in React - This article runs through an example of React implementation for searching using backend APIs.
5. Design a perfect search box: This article talks about a few design principles used while designing a search box.
6. Power of search: This article talks about the importance of search functionality on Instagram.

(S3) Activity Feed development and maintenance:

The final part of this milestone is the creation of an activity feed, where the recent posts of the followers can be viewed. This is a crucial part of any successful social app that is the seamless and effortless interaction with one's social circle.

_____

Here are a few very interesting and important articles/guides on how to get started:

1. The essential guide to building an activity stream into your app: This article provides a comprehensive guide to develop the activity feed.
2. Xbox one's activity feed: This is an example of how Xbox One maintains its activity feed.
3. How the Instagram algorithm works in 2018: Everything you need to know: Get to know how Instagram keeps its users engaging with up-to-date relevant content.
4. Guide to activity feed design & news streams: This gives an overview of the things to keep in mind while designing the activity feed
5. 40 inspiring examples of mobile feeds: This article offers numerous examples of engaging activity feeds.
6. What are the best practices for building something like a news feed? Here, you can read about a set of best development practices.

Maintaining activity feed deals with a lot of writes and reads to the database. So here are a few resources to read about how to build scalable architect.

1. Architecture: how would you go about building an activity feed like Facebook?
2. Stream & Go: news feeds for over 300 million end users: This article draws practical studies from deployed systems in Twitter, LinkedIn, and Yahoo.

Milestone Deliverables/Grading Scheme: What to submit?

At the end of this milestone, each team needs to prepare a presentation that concisely summarizes achievements of the milestone. Your presentation at the minimum must include the following

1. Your detailed design and justification of how you generate social data. For example, the workflow (steps taken) of how a post is created including the storage of its content (both textual or images) and the life-cycle of how a post is maintained. For example, if the post is liked by others, updated, commented on, etc.
2. The workflow of the search feature, and the sample queries for implementing the search functionalities.
3. The workflow of the activity feed feature, and more importantly, the sample queries for generating and aggregating the user's feeds.
4. The live demo presentation. An example of a live demo flow could be (you are not limited to this flow): *Login as User Alice -> Search User Bob and Follow Bob -> Logout, Login as User Bob -> Create a Post P -> Update the Post P -> Logout, login again as User Alice -> Show the Alice's Feed.*

Instructor: Mohammad Sadoghi
TAs: Sarmishta Burujupalli
Giritheja Sreenivasulu

Due Date: February 26, 2019
Submission Method: Canvas
Score: 15%

_____

In your submission, please also include the screen recording of your planned demo (for offline viewing). Also, you will need to submit **the presentation slides in .pptx, .key, or .pdf format, the screen recording of your live demo by the due date.** The submission is done through Canvas, and only one group member must submit the package on behalf of the entire group.

If you had any major changes to your initial proposed approach, make sure you describe the changes and include the justification for the change.

The actual presentation and evaluation will be scheduled after the milestone due date. Each group will be assigned a dedicated 15-minute timeslot. The presentation must be completed strictly in 10 minutes (no extra time would be granted) followed by a 5-minute Q&A. In Q&A, each team member will be asked questions related to any part of the milestone to ensure every student's participation and understanding of the whole assignment. Groups with five members will receive an 18-minute time slot.

During the 10-minute presentation, each student must present their respective parts, e.g., each team member would take up one milestone and they would focus on the tier of the app they are leading (e.g., front-end, app logic, data model, or backend database).

Important Note: The presentation slides, the live demo, screen recording must be identical to the materials submitted by the milestone due date.

As noted in the course syllabus, for each milestone, a portion of the grade is devoted to the presented project as a whole on which all members receive the same grade (70% of the grade), but the remaining portion is individualized (30% of the grade), so for each milestone, not all group members may receive the same grade. In each milestone, a bonus of up to 20% can be gained to further encourage taking a risk, going the extra mile, and just to be curious & creative.

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.

_____

Disclaimer

The external links and resources that are being provided on this handout serve merely as a convenience and for informational purposes only; they do not constitute an endorsement or an approval of their products, services, or opinions of the corporation or organization or individual. As a student, developer, or researcher, it is your sole responsibility to learn how to assess the accuracy and validity of any external site. This is a crucial skill in the age of the Internet, **where anyone can publish anything!**

_____

Changelog:

Milestone Handout Version v1: February 13th, 2019 (initial posted version)