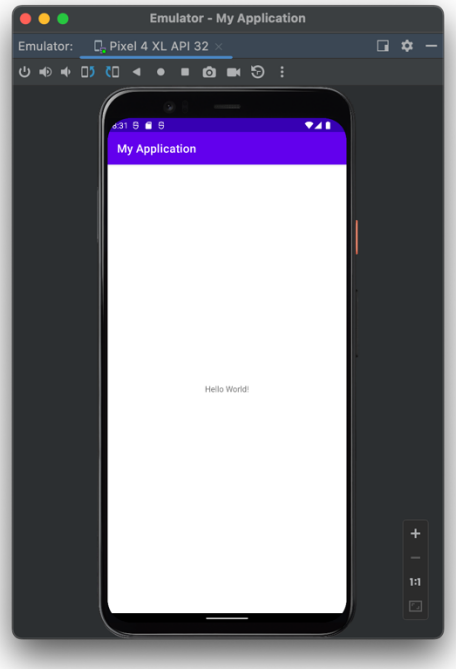
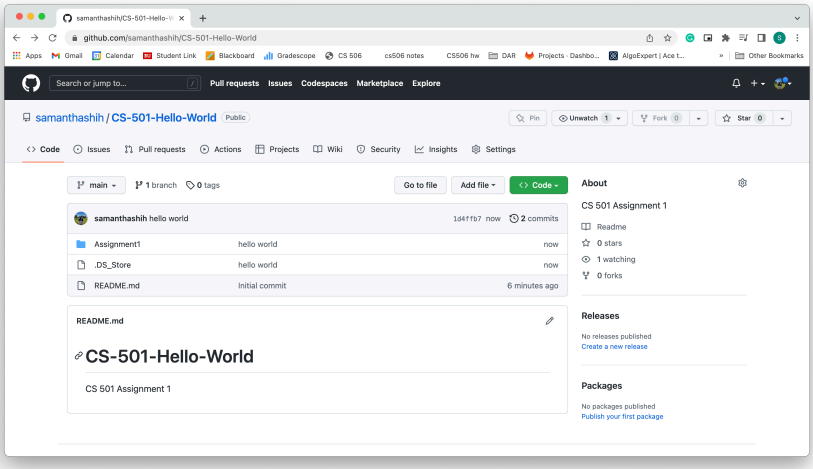
CS 501 Mobile Application Development
Spring 2023
Assignment 1 – Getting setup and your first apps

Due: Night of lecture 2, before class.

Do not email homework, please submit on Blackboard. You should also take screenshots or recording of your assignment and submit. Post the code on GitHub and submit the link and the videos in a zip file. Portions of this assignment must be done and submitted individually; other parts are to be done as a group.

1. **(Group)** Take the Hello World app we went over in class, build, and run it, and upload the project to GitHub. Take a screenshot and submit on Blackboard.





2. **(Group)** Using the GeoQuiz example from class as a starting point, customize the toast by using a Snackbar instead of a Toast. While using a Toast is a convenient way to display UI, we recommend using a Snackbar in your applications because they are more configurable in both their appearance and behavior. Refer to the developer documentation at developer.android.com/reference/com/google/android/material/snackbar/Snackbar for more details. (Hint: Look at the make and show functions.) Submit a video recording of this app running.

Video submitted on BlackBoard

3. **(Group)** As a group, complete the Worksheet below and submit to Blackboard.

CS 501 Mobile Application Development
Spring 2023
Worksheet 1

Date: Jan 26th, 2023

Team members:
Melody Chan, Samamtha Shih, Sarah Taaher Bonna

The purpose of this worksheet is to initiate some collaboration that will get you thinking creatively about the functions and features of your mobile device. Please try to get to know the people you are collaborating with. They may become your team members for the final project.

Assignment is due via Blackboard by next class. Do not email homework. Please submit via Blackboard.

Please write your answers clearly or type them.

1. List the various sensor and devices on typical mobile phones.

   - Camera
   - Accelerometer[1]
   - Magnetic field sensor[1]
   - Gyroscope[1]
   - Heart Rate[1]
   - Ambient Light[1]
   - Proximity[1]
   - Barometer[1]
   - Ambient Temperature[1]
   - Relative Humidity[1]
   - Microphone
   - Motion Sensor

   [1] https://source.android.com/docs/core/interaction/sensors/sensor-types#ambient_temperature

2. List five of your favorite apps. Briefly describe what they do and what makes them so great.

   - **Instagram** - social media app that allows users to share photos and videos with their friends and other users. Instagram is great because of the endless content on the platform, and it has a lot of customizability.
   - **Netflix** - media streaming app where you can watch movies and TV. Netflix is great because a bunch of content is concentrated in one location, and it saves where you left off in tv shows. Putting on a show is easy and takes one click.
   - **Amazon** - e-commerce app that allows you to shop a huge variety of products. It is great because it is easy and convenient to use, saves people time.

- **BeReal** - a social media platform where everyone takes a photo at the same time during the day and posts it for friends to see. BeReal is great because of its simplicity and quick daily use.
- **Youtube** - an online video-sharing platform where people all around the world can upload and watch videos, which range from comedy to news. This platform not only allows people to learn new things by watching educational videos, but also allows them to relax by watching videos that are entertaining.

3. Identify an App you use often, but you wish were better, (eg., - Uber, Lyft, Venmo, Indeed, FishBrain, etc.) Identify the pros and cons of each, and what features are great, but could be improved, what features are missing. For the latter two items, describe with some detail how you would implement these features and what technology might be used to implement these missing features. Be ready to present to the class.

Lyft - An app that can schedule rides for the user

Pros:

- Can access a service in minutes
- Can see the driver's live location as an animated car icon
- Has different integrated payment services - credit card, Apple Pay, etc.

Cons:

- Cannot access the ride history without entering the location.
- Cannot pinpoint the user location manually

The service that can be improved is that you can notify friends and family that you're taking a Lyft, but only if they are in the same country because it is through SMS. It should be allowed to message people through different messaging platforms such as WhatsApp, so that concerned parties overseas (e.g., parents of international students) can track their child's journey. A missing feature is you don't have much control over what car you will be taking. For example, Lyft could give you a list of options of different drivers and cars with varying prices based on different factors (type of vehicle, driver rating, etc.). This could also allow for people to feel safer, as a lot of women feel safer at night with a female driver.

Google Maps – mapping platform

Pros:

- Can enter the current location or can choose to detect the user's current location and estimate the travel time to the destination via vehicle, public transportation, walking.
- Can view multiple restaurants and click to view more information.

Cons:

- The offline features of the app are quite limited. For example, does not allow you to view your timeline or trips if offline

Instagram – social media platform

Pros:

- Improves communication, helps build a professional network and serves as a huge advertisement platform.

Cons:

- A glitch due to which Instagram shows two stories from the same account.
- An account is taken down without any warning or background investigation if a certain percentage of people report it, and once taken down, there is no option to revive the account or obtain reasons that lead to deletion of the account.

4. **App design challenges.** For each of the scenarios below, design an app that might be helpful. Consider all of the resources and tools available to you (or that you might implement or get from a 3rd party) on a typical Android cellular phone. Eg., voice recorder, call blocker, databases, crowdsourcing, caller ID, SMS, Camera, gyroscope, GPS, etc. Storyboard your idea on a separate sheet of paper, that is describe the application and sketch what the app might look like.
   You will work in teams on this, be prepared to present your designs to the class next week.

   a. **Emergency response app**. Every year at BU incoming freshman are overwhelmed by the city and occasionally get themselves into dangerous situations. What are some of your ideas for an App that would enable someone to know where it is safe to go and, if in trouble, quickly and easily notify others.
      - Consider the different sensors on an Android Handset.
      - Also consider the possibility of crowdsourcing real-time and archived data

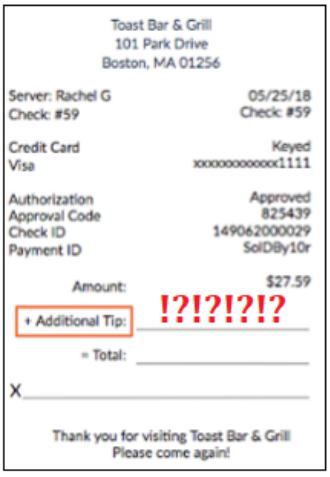
      An app that:
      - Detects your current location using GPS and can notify the user of the different locations to go to or if they need to quickly contact emergency services.
      - Integrates sharing locations to other messaging apps (SMS, WhatsApp, email, Bluetooth, etc.).
      - Is authorized to make emergency phone calls and has access to your personal medical records, to be accessed only in an emergency. The layout of the app must be such that the emergency call button is easily reachable by anyone, no matter the size of their hand e.g., call button on the bottom right/left side of the screen, depending on which hand is the dominant one (this can be modified in the settings of the app).
      - Displays information about nearby hospitals, police stations, according to the type of emergency.
      - Suggests proper actions that should be taken according to specific scenarios.
      - For each street, display the number of people that are along that street at that point in time (real-time data)
      - For each street, display historically (e.g., on that day last year, or on average), how many people are along that street at each hour of the day e.g., Google Maps shows for an area, how busy it typically is at each hour of the day.
      - Long press, to provide the option of opening the app immediately for access.

b. **Contractor for you.** This is an app that connects professional contractors with individuals who need work done on their home. If someone were to pay you to design this app, what are some of the things you would need to consider? What would some of the requirements be in terms of device hardware/software/back-end storage, etc?

An app that:

- Would require a database that contains information about the resources each task needs and the app should be able to check whether there are enough resources to accept a job request.
- Detects your current location using GPS and displays a list of the contractors with the first one on the list being the most relevant and the nearest the us.
- Displays a progress bar indicating the progress of an accepted task. It also helps give the customer an idea on estimated wait time.
- Has an option to filter the available contractors based on the cost, rating, experience, etc.
- A button to notify all contractors within a set radius to receive and compare quotations.
- Stores the specialization(s) of each contractor in the database. When creating a new job, individuals need to include what type of work they need e.g. renovation, carpentry, etc. The requirements will be matched to a contractor with the relevant skills and experience and within a certain distance from the customer, with the search radius being customizable.
- Allows communication between the contractor and customer via in-app messaging.
- Estimate the cost of the work based on the contractor's previous rates.
- Allows scheduling, canceling, and modification to appointments.

c. **Don't fleece me dude.** Quite a few users of credit cards do not regularly check their statements. Or, when they do, they check them long after making a charge. Unscrupulous vendors might take advantage of this laxness. Let's focus on one specific area, tipping at restaurants.



Design an app that would enable a restaurant patron to validate that the tip they left is the same as the tip that was charged. For example, when you go to a restaurant, a hold is placed on your credit card and a tip is added after you leave. What if an unscrupulous waiter charged you a different amount then you had written in? How could you automatically be notified that this occurred?

App description (be detailed):

Requirements of the app:

1. Integrates the phone camera into the app that allows customers to scan the receipt to get the restaurant name,

date, time, total amount to be paid and the tip amount. Allows users to manually enter the details as well.

2. When the total amount with the tip is charged, the app will be notified via the banking app of the amount charged.(The bank needs to put a hold on the payment until the customer confirms the amount charged is correct through our app.) The app compares the amount charged with the amount that was scanned/entered by the customer. If there are any discrepancies, the customer will flag it in the app, which will notify the bank and the restaurant of the issue.

Assignment 1 Don't fleece me dude