**Budget Management**

Iteration 1 Progress Report

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1. What were the main difficulties so far?

Many of us did not really have much experience with Android Studio, so there was a slight learning curve to getting used to using it. In addition, we had some difficulty getting our server and client up and running so that we could make database queries for logging in, creating accounts, viewing information, etc. This has slowed down our progress in getting some of our backend work done, as we have been able to get most of our frontend done, but for a fully functional page, we need the server, client, and connector classes up and running.

Given our limited mobile application development experience as a team, we had anticipated that there would be some difficulties, but we still found it to be one of our main roadblocks in development during iteration 1. Now that we have found our footing with Android Studio, and mobile application development in general, we feel that iteration 2 will not have the same level of difficulty as iteration 1.

In addition, given recent circumstances, we are not able to have our in person meetings and coding sessions anymore, which has been quite an adjustment for us as a team. We are all working remotely, and this has required a large adjustment in our workflow as a team, but we feel like we have adjusted and are ready to take on the rest of the semester in this manner. We tested to have a remote voice meeting and it worked, so we will continue to do weekly meetings and communicate on Slack for the rest of the semester.

2. Were there any features you did not implement as planned, and why? Are you pushing some features to later iterations, and if so, why?

We originally planned to set monthly goals for each category and total spendings for each user. In iteration 1, we redesigned the ER diagram and ended up with only setting monthly goals for total expense. Our team will talk about this and decide later whether it is necessary to allow users to set goals for each category, which might make the app too complicated to use. We will push this feature to later iterations.

Due to some difficulties in setting up the server and client, as well as our focus on the frontend for this iteration, we are now pushing our work to have the successful login into the application to iteration 2. Now that we have a functional server and client, and most of the UI done, we anticipate that this work will not take too long, as the components are there, but we need to put them together.

The connector class has been worked on, but will need to be tested and potentially modified to be completely done for our application, so the last part of this development will bleed into iteration 2 somewhat.

Given that we had initially set our timeline as iteration 1 for setting the foundation for our application, iteration 2 as connecting our front-end and back-end together, and iteration 3 for testing, we are mostly on track for iteration 1, especially given recent circumstances that has made our development process much different than what we had expected.

3. What tests did you prepare for this iteration, and what are they covering? Did the tests you wrote deviate from your plan? What features are you not testing yet? Did you use any test frameworks, such as JUnit, the Android Monkey, Selenium, etc.?

Due to our iteration 1 work being primarily focused on setting up the interfaces used in our application, as well as trying to connect them, there was not much room to write unit tests. Most of our team spent time trying to get the layouts done, and the skeleton code written so later backend development would be an easier task. We have checked every change and commit on different emulators, to ensure that our application is still functional after each commit. We are also planning on investing in a cheap real android device for later iteration testing on real devices in addition to the emulators. The devices we have tested on via the Android Virtual Device (AVD) manager are: Pixel 2, Nexus 5X, and Pixel XL. We will try and test on other devices in later iterations to ensure that our application functions on a wide variety of at least virtual devices.

We have not been able to run extensive performance tests, due to the fact that at this point we have different activities corresponding to the different pages designed, but with limited to no backend functionality. In Iteration 2, we will be able to integrate the back-end code we have started with our existing UI, and as a result we will be able to run extensive performance tests.

For the back-end SQL queries, sampled data was simulated to test the functionality of each query, so that it can work correctly after being connected with the server.

In addition, for client and server communication, we made sure that they were able to communicate; however, being that our connector class isn’t fully tested yet, we aren’t able to access our MySQL database yet, so while they can communicate, we can’t actually store or fetch data yet. This will be one of the first things that get completed in Iteration 2 as it is vital for our application to function properly. We didn’t use any testing frameworks for the backend, but rather sent simple messages between the server and client making sure that the client was able to send a simple message and the server was able to respond properly.

A lot of testing done in this iteration was manual testing,as we were primarily dealing with developing the views for our application. Since each page of our application was created as an activity in Android Studio, we would be able to test it on its own, before adding it to the larger application that contained the rest of the applications. As a result, we were able to verify how each view looked, keep layout constraints, and that our frontend components worked the way we intended it to.

Submission

Our github repository, BudgetManagementApplication, has been shared with our TA Siyang Chen. In order to check the code and run the application for iteration 1, you can follow the below instruction or the identical instruction in README file.

1. Go to BudgetManagementApplication repository
2. Install Android Studio, if you do not have Android Studio.
3. Clone the repository.
4. Follow the instruction on README

On README...

1. Download Android Studio, if you do not already. You can download Android Studio from the following link: https://developer.android.com/studio
2. Open the project titled "BadgerBudget" in Android Studio. You should be able to see the code for our application that we have completed at this point. There are 2 "com.example.badgerbudget" folders, one with just the file "BuildConfig" in it, and the other with our code. You can navigate to the second folder via the path app > java > com.example.badgerbudget.
3. To build our application, go to Build -> Make Project. This should run without any issues.
4. Now to run our application, you will need an Android Virtual Device (AVD). Follow the instructions located at https://developer.android.com/studio/run/managing-avds to create an AVD.
5. Now, you should be able to hit the green triangle near the top left of the screen in Android Studio, and it can run on the AVD that you created earlier. You should be able to see the first page of our application, but not much else, as are currently in early development of the application!
6. To see the other UI pages that we have developed but not linked to the application, navigate to the "layout" folder via the following path: app > resources > layout. This will contain xml files that when opened in Android Studio will show you what the other UI pages that we have developed.