Project Plan: Mental Health App

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Clients:

Our target demographic are college age young adults, mostly being us and our own demographic. As such, we decided to find external individuals to act as clients that are in that demographic.

- Calvin Schwartz: External Client
- Maya Lindseth: External Client

Meeting Dates with Clients for Plan: 1/15/2022

Goal and Motivation:

In our experience, there is a trend of many college students having a loose understanding or commitment to managing aspects of their lives aside from college itself, including diet and exercise. As there is a trend as well of younger people and students having more mental health difficulties and problems, managing these things becomes more important due to their link to mood and mental health. Although there are mental health and fitness apps that could help students track and manage their diet, exercise and monitor long term moods, they are filled with many excess features, paywalls, and require a large amount of time and effort to get strong use out of them. We want to create an app that contains the same functionality of providing tracking and suggestions of general dietary decisions and consistent exercise while providing a way to track your mood long term while being quick to use and grasp to reduce the motivation needed to commit to such logging. We also have the goal to provide the user a push to use the app on a daily basis via a simple “game” that gives a sense of long term progression, at least enough to justify a few minutes of each day to use the app to hopefully help students make some better decisions about their overall health.

Approach (key features of the system):

1. This app will help you keep track of general health factors including your daily mood, what food groups you have eaten as well as if you have exercised and for how long. This information is kept and can be viewed in a direct calendar

format or through graphical representations that can then be compared with the other factors logged to help you notice any potential trends, prompting you to examine your choices to help you make better ones. You can view mood, dietary and exercise amount information all together in one graph and in various expanses of time. This logged information is designed to be as stress free and quick as possible to record and obtain your information so that even with minimal effort you can still examine your trends and decisions when compared to expansive and time consuming fitness and health apps.

2. Depending on your logged information, this app will send you notifications to point out any dietary or exercise related trends that could potentially lead to poorer health and mood. These notifications are general and not extremely specific to serve to be an easy to follow suggestion, pushing you to make good choices without feeling overwhelming. These notifications can change in how many days a trend should occur before notifying you, as well as be disabled outright so that you can choose how strict the app will be or release any pressure you may feel from the app which would be counterproductive to the goal to help you monitor and even improve your general health.

3. Every day that you log into the app and record as much or as little information as you desire, a game is updated. This game provides a pixel art character, landscape and interactions that hold their own adventure and life alongside you which provides a new scenario that this character you can name and customize has gone through that day as you have gone through yours. The app changes appearance depending on the month to make this adventure feel varied and genuine, and these scenarios are recorded so that you can look back over time and see how it has built up. Depending on some of your choices in logged information as well as other interactions, achievements can be met that allow for more art and scenarios to be unlocked, providing a small incentive to make good health decisions while not punishing you for your mood or what you log.

Algorithms and Tools for Features:

1. The app uses an SQL database to store logged information in an efficient manner that ensures that daily information is kept with its relevant information and date in the database. The app is entirely done in Android Studios (with java as our language), so this is done with native SQLite database handlers to send queries into a saved database on the device. MPAndroidChart, a commonly used free public library for creating charts and graphs, is used to graphically display bar graphs of logged information based on what the user wants to see. The UI is made using XML, which is easily done with Android Studio and its Android emulator, an IDE and emulator made by Android themselves.

2. Notifications are handled by simply calling SQLite queries to the database based on user choices in the settings, which create pop ups for the user to view. An example of this would be the query:

   SELECT (Exercise) FROM Daytable
   WHERE Daynum >(currday - [value specified in settings]) AND Daynum <=curr_day
   AND monthnum=[this month] AND yearnum=[this year];

   Where the app would then check the amount of the information requested or averages to see if it should send a notification. This will occur in each log in, and as the database simplifies itself over time by removing all day information in a passed year to leave only averages should remain fairly quick.

3. The game uses assets made by the project members and displays them based on a generator that randomly grabs a scenario and the related asset depending on what achievements the user has accomplished which will themselves be checked and completed during their relevant action, some on login or after a certain piece of information is logged. Our current plan to accomplish this specifically is creating a table in the SQLite database that is unrelated to the other tables or a completely separate database with a single table that contains rows that have an id, what achievements they require, the path of the asset they use and the text for their scenario which can be grabbed quickly via random queries. The text and date would then be stored in a simple log to be viewed by the user.

Novel Features:

None of the features or functionality themselves are novel individually, but in our research we could not find any apps that have all of the features together. Most apps that allow logging of daily information don't measure mood or use a game to incentivize usage - likely due to these kinds of apps being directed to individuals motivated to record and log information about themselves for future usage while this app is directed to those who may not have that motivation.

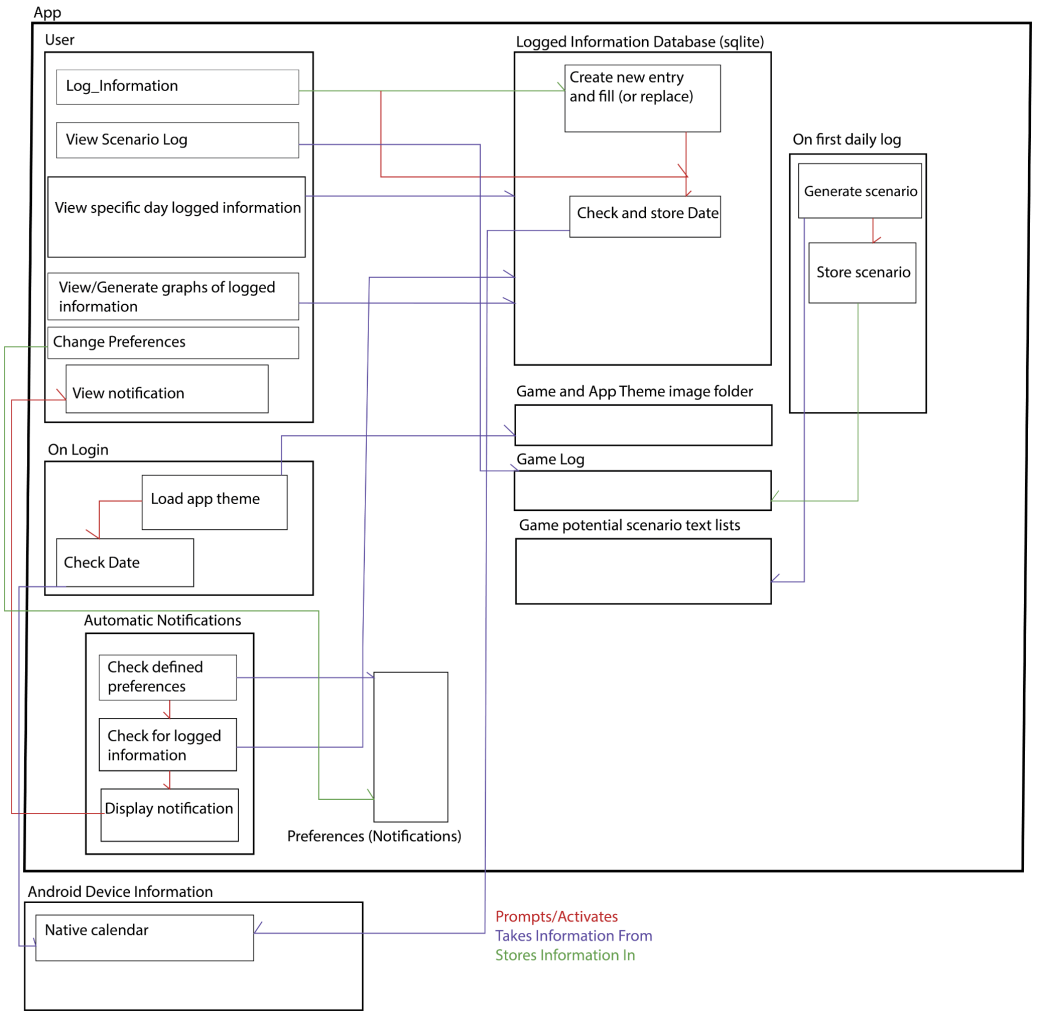
Technical Challenges:

1. Even with a semester of experience using Android Studio, we are having problems with it. Some of us have experienced crashes, extremely high CPU loads, and problems exporting the app to share changes with one another. We

also have not used a lot of the functionality of Android Studio, and every time we try to add new pieces of code using a part of Android Studio it requires a decent amount of research.

2. We need to continue monitoring the SQLite database to ensure accuracy and light memory and time load which requires some testing from us, as we are not totally sure how it will turn out after hundreds of days logged in regards to memory and potential more pruning may need to be used.
3. We are still learning how to program in Java as we were all unfamiliar with it when we started the project.

Design / System Architecture Diagram:



Evaluation:

We will be measuring our success through a few different metrics. We will test

the speed of the app and more specifically the database through different test cases for retrieving data from the database using different amounts of stored data. Another metric will be a user survey that will include questions about the user experience of the app and how useful it is. We will also have to test every input field for “wrong” data such as a String in an Integer field to make sure the app handles it properly. We also will test the database by placing in a large amount of data to ensure the app stays at a reasonable memory usage state even over a long period of time.

Progress Summary:

Module/feature	Completion %	To do
GUI	60%	Add app disclaimer on startup, implement pop up notifications, finalize connecting all logs to the right pop ups, complete and implement graphical assets.
Database	70%	Finish incorporating the database into graphs, and test the database for accuracy and speed.
Graphs	40%	Add the correct type of graphs instead of pie charts, add time period functionality,

		and retrieve database information.
Notifications	20%	Add the checks based on settings to call the notifications and make the pop ups.
Game	5%	Add game assets, add the scenario generator, add achievements.

Milestone 4 Itemized Tasks (Feb 14):

- Create Graphical assets
- Implement the graphical elements/theme to the app corresponding to one month.
- Create notifications based on previously planned database/SQL queries and information.
- Complete storing information in the database through pop ups and obtaining it in graphs.
- Create a dummy scenario generator and make an example game screen generated from stored images as well as a dummy scenario text.

Milestone 5 Itemized Tasks (Mar 21):

- Evaluation Results
- Create poster for Senior Design Showcase
- Finish making and implementing graphical assets and continue adding new monthly themes.
- Create a full scenario generator that checks if certain requirements are met to decide on a random scenario and correctly fetches graphical assets to match the scenario.
- Save the generated scenario to the log.

- Add some “achievements” based on logged information to allow for more possible scenarios.
- Research for any modifications to be made to notifications or logged information.
- Complete calendar that shows a day's logged information to the user.
- Finish deciding over a name for the app that properly expresses the desired usage.

Milestone 6 Itemized Tasks (Apr 18):

- Test/Demo of the entire system
- Evaluation Results
- Create User/Developer Manual
- Create Demo Video
- Finalize graphical assets and add any last themes to the app.
- Add more achievements and scenarios to the generator.
- Allow for the user to enter a name for the character used in the scenarios.
- Allow users to select a few different sprites for the character used, and allow for changing when the user wants.
- Complete any final features or tweaks not finished in previous milestones.
- Add a “splash” screen upon startup that includes disclaimers about the app as well as standard mental health support recommendations like important hotlines.
- Add user experience surveys to the app.

Task Matrix for Milestone 4:

Task	Josh	Phi	Daniel
Create graphical assets for the app to use.	80%	20%	0%
Implement the graphical elements/theme to the app	40%	30%	30%

corresponding to one month.			
Create notifications based on previously planned database/SQL queries and information.	20%	40%	40%
Complete storing information in the database through pop ups and obtaining it in graphs.	33%	33%	33%
Create a dummy scenario generator and make an example game screen generated from stored images as well as a dummy scenario text.	15%	35%	50%

Description of Tasks for Milestone 4:

1. Creating the graphical elements will be fairly labor intensive and will take time, so we loaded most coding onto the other project members while keeping the group members experienced in making graphical elements working on that part. We will need to figure out if we will need to compress

the elements or if they will be small enough to where it won't take up much space.

2. Implementing the first month will involve changing the themes and borders of the app and may prove fairly difficult, as we will need to make many specifications to make it look good, and change many elements of the app to have it all match up in an aesthetically pleasing way, so more extensive contact with the clients will be necessary in this milestone.
3. Creating notifications will be implementing the planning tasks from Milestone 3 by having a snippet of code run when the app is booted and check the last few days based on the settings menu, which will also need to be fully implemented for this task.
4. Finishing storing and retrieving data in the database as a task is mostly checking our work and testing it to see if we missed anything out or we have vulnerabilities in our SQL, as well as completing the bar graphs required for our graphing pop ups by grabbing information from the database based on what timeframe the user requests.
5. The generator will start simple just to ensure it works, as we plan on spending a lot of time in the next 2 milestones after improving the generator and giving it as many options as possible, so it will largely be a work in progress for the rest of the project as it and the plan for having achievements will rely on how time turns out as we want as much as time and space allows for each to incentivize usage.

Approval from Faculty Advisor

"I have discussed with the team and approve this project plan. I will evaluate the progress and assign a grade for each of the three milestones."

Signature: _____ Date: _____