ECE1779 Assignment-2
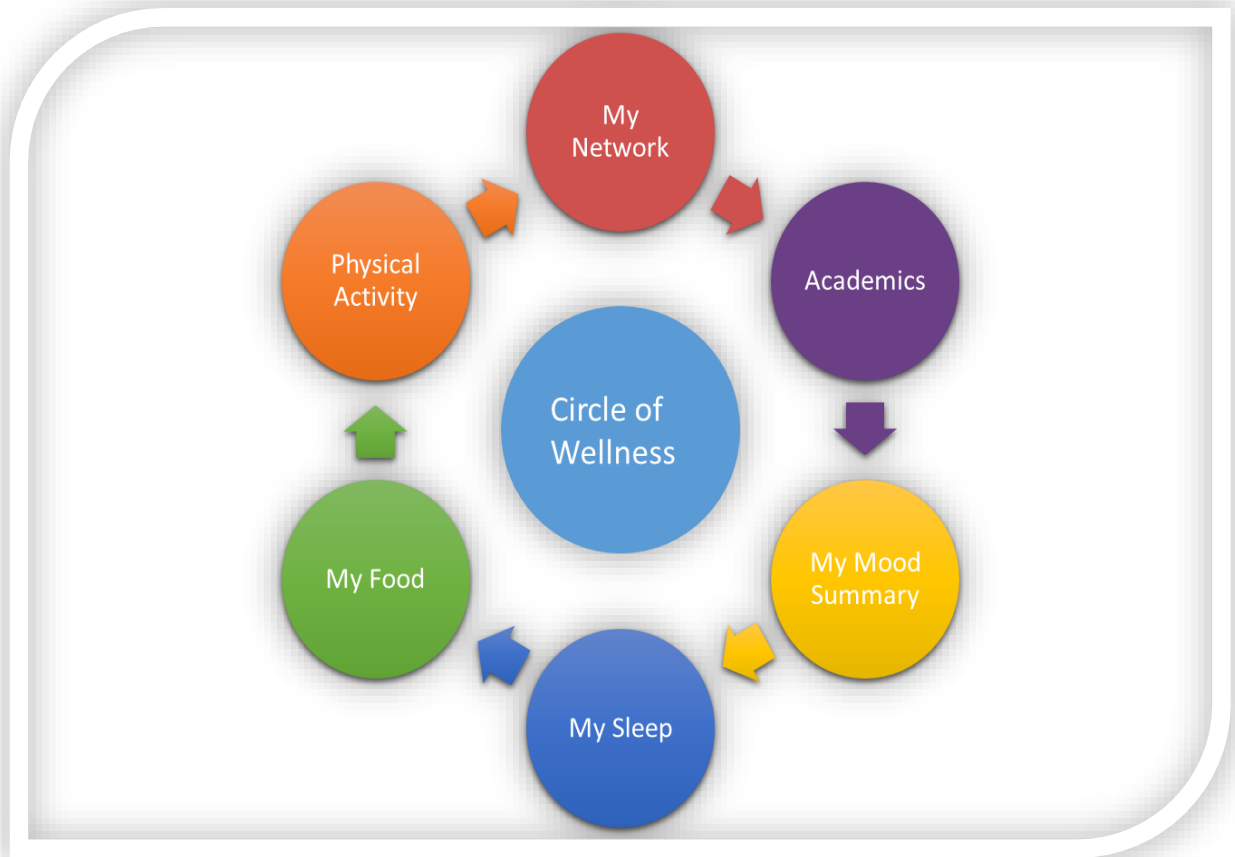## Daily Self Care

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1. Introduction

"Daily Self-Care" tool is an application to support Students of university of Toronto in making healthier choices on a regular basis. The app incorporates a comprehensive list of health and academics recommendations. It would allow for personalized information to be made immediately available to students-in-need. The health recommendations are customized depending on the data that is gathered, and a student's responses to the questionnaire. This application is originally based on a paper tool named Daily Self Care Log (*Figure 1*). It was developed in health and wellness center of university of Toronto [1].

Figure 1: General Architecture of Daily Self Care App

My daily self-care log is paper based and there are some issues associated with it. First, it is not accessible for all students of University Of Toronto. Second, it is very hard to track their progress on a regular bases. Lastly, it is not customizable according to a user's preferences or

needs. As a result, we thought the *Daily Self Care Log* tool would be better received as a web and mobile application.

2. General Architecture

General architecture of our *Daily Self Care* application is shown in *Figure 2*. The project includes two interfaces: web application and mobile application. Amazon Web Services are used for all backend supports including "serverless" web hosting and storage.
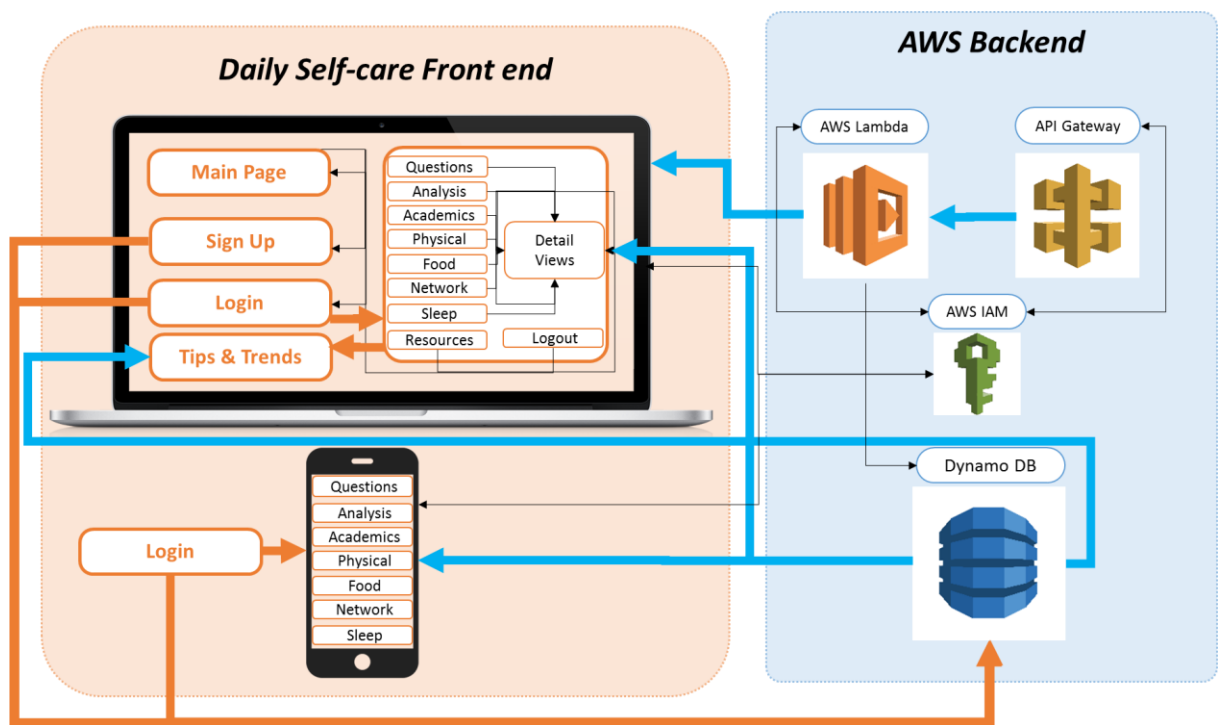

Figure 2: General Architecture of Daily Self Care App

Daily Self-Care App uses following Amazon Web Services:

- All data including all tips, users information, and answers to the questionnaire are persistently stored in Dynamo DB.

- The backend logic is built and deployed using AWS Lambda and API Gateway.

3. Statement of Functionality

The main page includes two buttons which allow users to create a new account or login into their account (*Figure 3*). A user can track his or her progress in five disciplines including academics, physical activity, food, network and sleep.

Figure 3: Main Page of Daily Self Care App
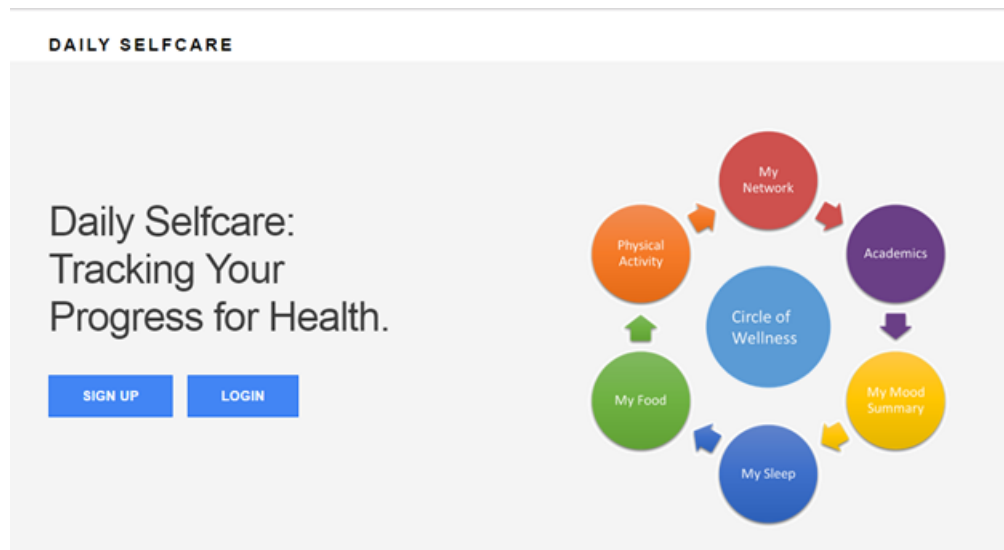
3. 1. Account

When a user login to the account he has three main options and a menu bar (*Figure 4*). A user can answer daily questionnaire to track his health progress. Furthermore, the user is able to view trends or choose to see all resources available in the website. In addition, he can choose to click on academics, physical activity, food, network, sleep categories. These categories display a series of more detailed questions and provide University of Toronto internal or external sources accordingly.

Figure 4: Welcome Page of Daily Self Care App

3. 2. Questionnaire

The questionnaire includes five critical questions in five different disciplines. All answers to these questionnaire store in Dynamo DB database and they are analyzed later on in the analysis section (*Figure 5*). You can update your answers if there is need to update some of the answers.

Figure 5: Daily Questionnaire

In addition, there are five separate categories of more detailed diagnostic questionnaire. These questions are employed to find appropriate tips regarding to specific problems a student might encounter during day to day life at school (*Figure 6*).

Figure 6: Sleep Question

3. 3. Tips

The application provides the user with appropriate tips according to diagnostic questions. All tips are stored in Dynamo DB tables which retrieve based on user's answers to questions.

Figure 7: Tips

For example, the user have chosen that "My roommate keeps me up" in *Figure 6*. The appropriate tips with regard to the user shown in *Figure 7*. Tips are clickable and direct the user to proper internal or external resources if they were available.

3. 4. Analysis

The user can see an overview of trends for all his health components (*Figure 8*). This graphs are based on data which stored in databases via the answers given to the daily questionnaire.

Figure 8: Trends
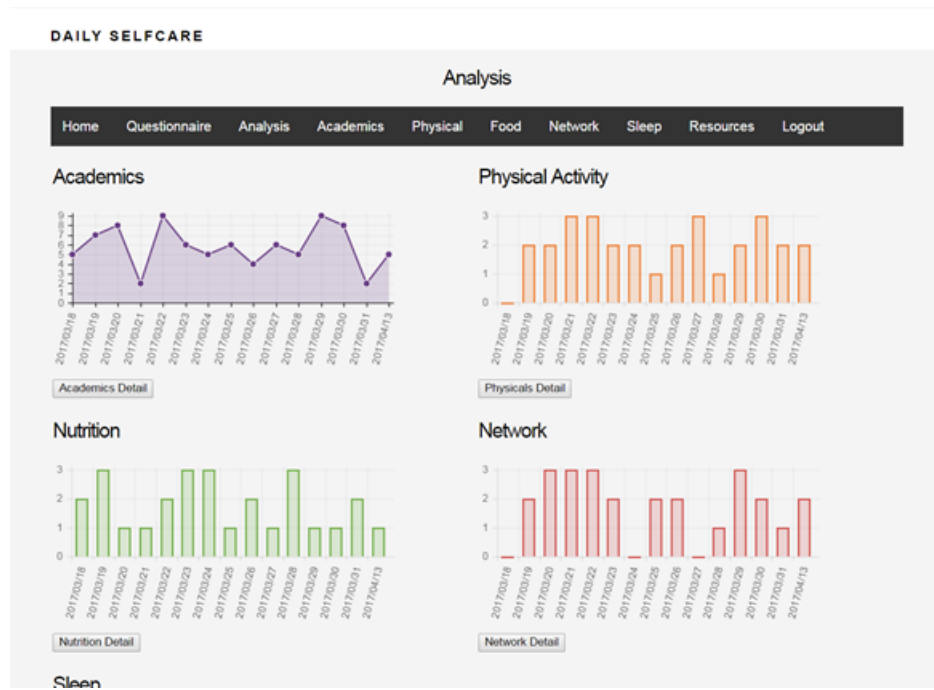
The detail view of all categories available by clicking on detail buttons (*Figure 9*). Detail view provides the user with information such as the date of last submission, average quality of certain activity and warning dates. Warning dates are those dates which user did not comply with the minimum requirements of healthy habits. In addition, an algorithm tracks the progress during the time and identifies if there is a pattern to the stored data. If the data is showing any linear trend, the magnitude of "Pearson product-moment correlation coefficient" [2] would be considered. In

that case, the linear regression will be calculated and the slope will be to provide some tips based
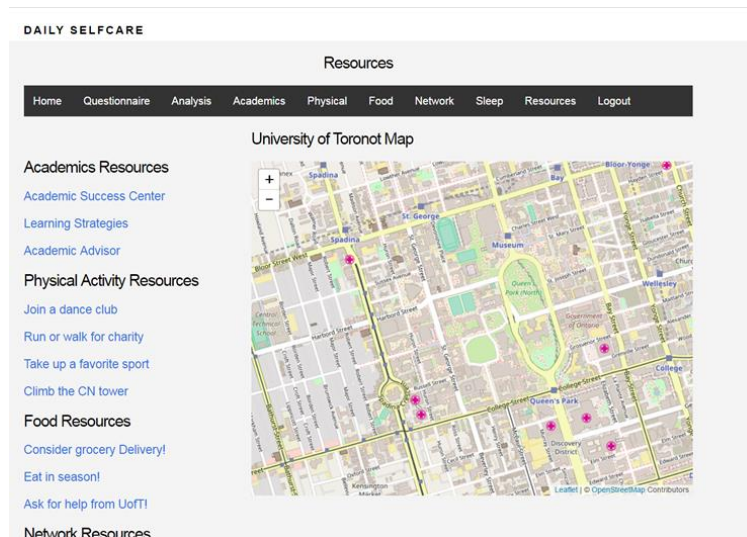
on the trend (*Figure 9*).

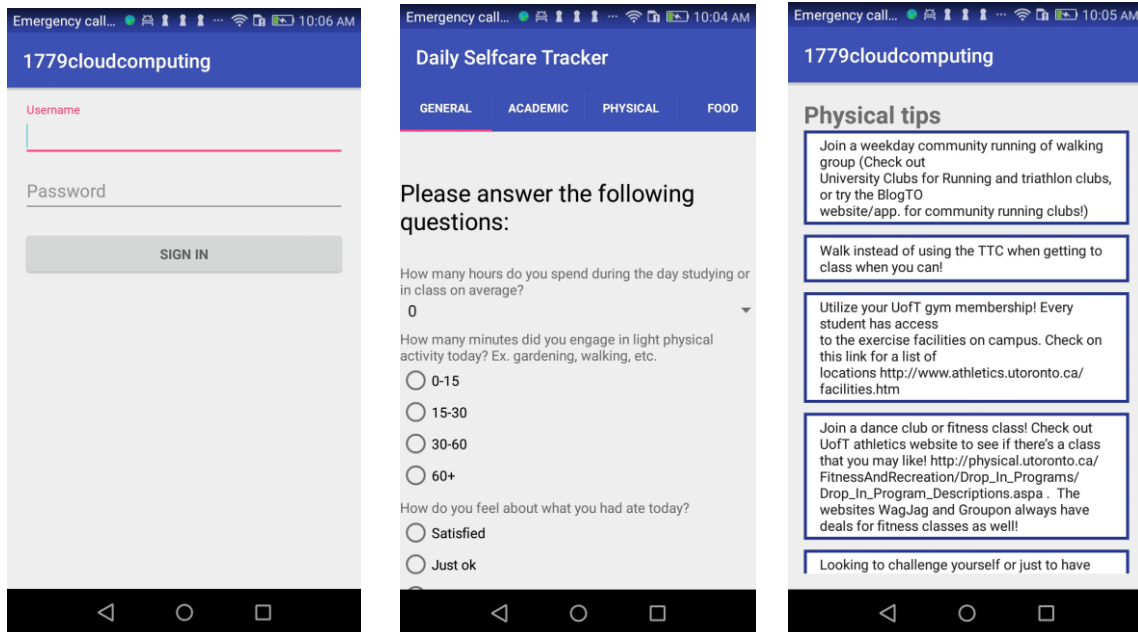*Figure 9: Detail View & Analysis*
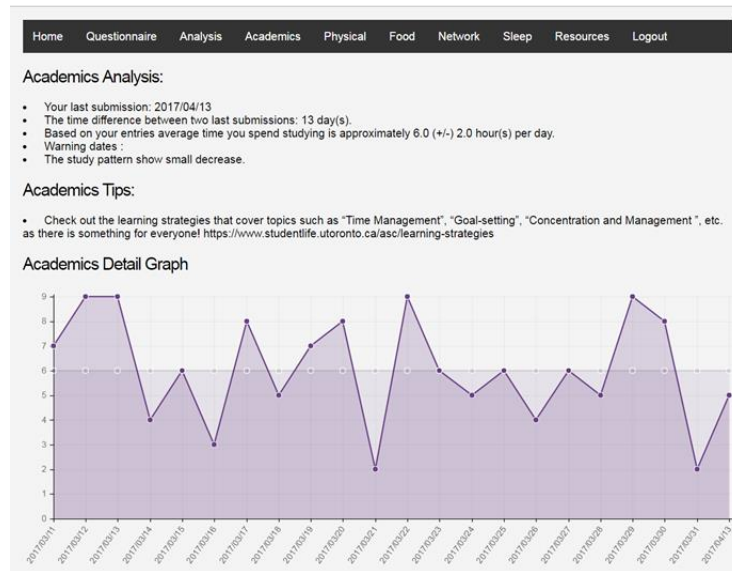
3. 5. Resources

The resources section of the app includes U of T map and links to all resources available

in the app.

Figure9: Detail View & Analysis

4. Mobile Application Functionality

5. 1. Overall Design Implementation

A2 web application is developed using Flask Micro framework. A2 web application overall design includes following components:

1. **Signup:** The mechanism to create an account is implemented in "signup.py" file.

2. **Login & Logout:** The mechanism to login into the account and logout which implemented in "login.py" file.

3. **Questionnaire:** All questions and methods to store answers to questionnaire is implemented in "questionnaire.py".

4. **General:** All methods to get the answers from diagnostic questions in different disciplines, query different tables in database, and logic to retrieve proper tips from database is implemented in "general.py" file.

5. **Charts:** All method to show overall view of graphs, detail view of each graph, logic to predict the pattern of trends, and retrieve tips according to pattern is implemented in "charts.py".

6. **Address:** The logic to show the map and retrieve all links from the database and display them in resource section is implemented in "address.py" file.

6. Future Work

Daily self-care mobile application is connected to the same database as web application. This will allow Mobile application for automated data gathering. It is conceivable to gather more personal information such as adding pedometer for physical activity; or, tracking time a student spends in a library or classroom for analyzing academic activity. Additionally, the application could be improved by adding a feature which notifies the user in real-time for various events happening on the campus.

Moreover, pre-releasing the primary version of the app to students of University of Toronto in health and wellness department and measure their response and incorporating their feedback will enhance the quality of the application in the future.

7. Resources

[1] Judy Vorderbrugge, Geoffrey Hartin, Laura Duncan. "Daily SelfCare Log". Health & Wellness Centre of Universoty of Toronto.

[2] Stigler, Stephen M (1989). "Francis Galton's Account of the Invention of Correlation". Statistical Science., 4 (2): 73–79. doi:10.1214/ss/1177012580. JSTOR 2245329.