Problem Statement

In the post-pandemic era, people have become more conscious about health and mental health related issues due to the effects of COVID-19 on the body and also the effects of quarantine on the mind. However, even with more awareness towards health and mental health, people are still clueless on how to manage their health and mental health effectively. So, how can we tackle this problem?

With the prevalence of mobile phones in this digital age, the most effectively solution would be to make a mobile app as it gives people a way to monitor their health and mental health more easily. Due to the constraints of time, I have decided to mainly focus on two main aspect which are sleep and exercise. Sleep and exercise are both essential to the health of the body and state of the mind. So, why sleep and exercise specifically?

Without sleep, a person’s health will start to deteriorate as their immune system starts to weaken as they continue to forgo sleep. Health issues will soon follow a weakened immune system. This covers the health aspect of the issue. But, what about mental health? Without sleep, a person cannot function properly in their daily lives as they cannot focus and stay awake. This will correlate to a decreased productivity in their lives and this may lead to feelings of inadequacy and frustration to self and the scorn of others especially by your coworkers and employers. Hallucinations have also been known to follow prolonged lack of sleep and this may cause a person to be in a constant state of fear and paranoia. These issues directly affect a person’s mental health and must be handled carefully. So, sleep is particularly important to our health and mental health.

On the other hand, exercise is also important in maintaining a person’s health and mental health. Without exercise, the body will become out of shape as the excess fats in the body are not burned through rigorous exercise. This issue is particularly common in the modern era, where the conveniences of life are just a finger-click away. This can cause a multitude of issues such as high blood pressure, diabetes and etc. A large body size will also impede the movement of said person and inconvenience their daily lives. This covers the health aspect of exercise. Now, let us study the mental health aspect. In this conforming world, society will often mock what is different from them. This is an issue because humans are social creatures and require human interaction to survive. A large body size is looked down upon and will invite ridicule by our peers. This will have detrimental effects on our mental health. We might feel sad, stressed, depressed and even suicidal. We might even adopt unhealthy practices such as excessive dieting and bulimia to lose weight faster. So, even mental issues will snowball into health issues. So, it is clear to see that exercise is also important to our health and mental health.

Going back to the mobile app, the app solves these issues indirectly by raising awareness of the user towards unhealthy practices in their daily lives, thereby motivating them to promote positive change in their lives. The app achieves this by providing a platform to record the daily sleep and exercise schedule of the user, allowing them to review their sleep and exercise habits more easily. By allowing the user to see an accurate representation of their habits, they may more easily identify issues such as a lack of sleep or lack of exercise. They may then be motivated to amend these issues and this will have a positive effect on their health and mental health.

The mobile app allows its users to record information about their sleep schedule such as sleep time and wake time. The sleep duration is calculated automatically from the given information and is then saved into the app.

There are more options available for a user to record their exercise schedule. This is due to the fact that there are a multitude of different options for exercising while sleep generally means the same activity for everyone. So, instead of having the same set of exercises for everyone, the app allows the user to freely add their preferred exercise and delete unused exercises. The app will also allow the user to directly set the calories burned per minute for each exercise as each user may burn through different amounts of calories depending on their body weight and effort put into the exercise. Users can specify the type of exercise performed in a specific day and the duration of each exercise. The app will then calculate the calories burned in that day and record the data.

For users to accurately review their sleep and exercise schedules, the app provides options such as lists, charts and statistics to accurately present and analyze the results. Users can view their sleep and exercise schedules in list or chart form. In the list form, users are also able to sort their data according to different attributes and in both ascending and descending order. For the chart form, users are able to see their sleep and exercise schedules in temporal order and this will help the users to spot patterns or trends in their schedules which may be positive and negative and take appropriate action. For statistics, users are able to see results such as average sleep time, average exercise time and average calories burned. These results may be useful to the user as they may use these results to gauge their progression such as seeing if the average exercise time increases.

The app also comes equipped with a mp3 player. This addition increases the functions of the app and makes it more than just a health monitoring app. Music has also been proven to have a positive effect on mental health as it helps to relieve stress. An improved mental health will also have positive effects on our physical health. Users can freely listen to music before they sleep, during their exercise or any time they want. Users can also import their own songs to the app and also create their own playlists of their favorite songs.

So, it is clear to see that my app helps in improving and maintaining health and mental health of its users. My app achieves this by raising awareness of the user towards any unhealthy habits in their daily lives by providing a platform to record and display their daily sleep and exercise schedule.

Assumptions

The app assumes that its users have adequate deductive reasoning skills as no tutorial is provided. Users are expected to fumble their way around the app themselves and deduce the functions of each page through the words and images shown. So, the app is designed to be as intuitive as possible.

The app also assumes that the user is reasonable about the usage of the app. This means that the user will not input invalid values into the app such as a wake time earlier than their sleep time and an exercise schedule more than 24 hours long. The app provides some safeguards against these invalid attempts, but it is generally better if the user is reasonable.

The app also assumes a small amount of data. The app is not designed for large datasets numbering in the millions. A large dataset may cause lag in the app and may affect user experience. It is designed for the use of a small number of users.

The app also assumes that the user will give permission to read and write external storage data as it requires this permission to import new song files into the app and change song names. If no permission is given, the add song and change song name function may not function properly.

Concern and Challenges

The main challenge of this app is time. The functions detailed in this app are numerous and are not simple to implement. With enough time, the app is expected to be able to be completed. However, the need to balance my time with other subjects may negatively impact the production of this app. So, some functions may be less sophisticated than originally planned and the look of the app may be less appealing as aesthetics may be sacrificed for functionality.

Other than that, some of the functions detailed in the app are also quite complex and may be quite difficult to implement. This is an issue because I might not be able to implement the functions properly due to a lack of programming knowledge and experience. So, some functions may be repurposed or may be missing entirely.

Furthermore, the app also has to implement the function of modifying files from the external storage of the phone. This is to accommodate the function of adding songs and editing song names of the app. The methods involved are more technical and may be more difficult to implement.

Finally, the app also must create and maintain a database. This is to save the user sleep and exercise schedule data. The data must be saved and loaded every time the user uses the app. This function may prove difficult to implement as we must use an entirely different system entirely, namely MySQL. So, the function may be exceedingly difficult to implement, and I might have to revert back to using text files to store data.

Resources and Implementation

The app requires GitHub resources by PhilJay to implement the bar chart as the base functions in Android Studio do not provide bar chart functionality. The bar chart is used to display the user sleep and exercise schedule overtime so that a habit or trend may be more easily discerned. The bar chart is also scrollable to accommodate the large amount of data expected.

The app also requires access to a database to store the results. The database system chosen is MySQL. It is used to store user sleep and exercise schedule data. The data is loaded and saved every time the user uses the app. Different users have different data files and the data files to be loaded are decided during the login process. Guest users have the default dataset and do not have the option to save or load their data. The data can be reset manually by the user to the last save point by pressing the reset button. The save function of the app is also manual so users should always remember to save the changes to their data by pressing the save button.

The layout used in the app is mostly linear layouts. Relative layouts are generally used when a floating action button is used.

The calendars of the app are implemented using calendar view and the data is managed using buttons below the calendars.

The app also has an mp3 player on all 5 main activities. The mp3 player has a text view to show current song name, image buttons to pause/play song and move to previous/next song, and a seek bar to see song progress and replay songs from a certain point.

Users can navigate to different activities by using the bottom navigator. There are 5 main activities in the app. They must click the image on the bottom navigator to go to the activity.

The 3 main activities processing data (Music, Sleep, Sport) have fragment adapters managing different fragments for each activity. The fragments are arranged in a tab layout and are displayed by view pagers. They can be accessed by clicking the tab item on top or by swiping the screen left or right. Music activity has 3 fragments, Sleep activity has 4 fragments and Sport activity has 5 fragments.

For text input by the user, an edit text view and a button are generally used for this purpose. The edit text view is used to get input from the user while the button is used to verify if the input is valid. As an example, valid names mean that the input name has not already been taken while valid numbers only contain numeric data and nothing else. Passwords are validated using two different edit text view because different users may share the same password.

All data in the app is available in list form for the view of the user. There are 3 main types of lists used which are list view, recycler view and expandable list view.

List view is used when the data to be shown is few and can be displayed in a few short lines. The data shown also has no special functions such as expanding and collapsing when pressed. List view is used to display song list and sport type list. This is because both list data are short and do have any special functions.

Recycler view is used when the data to be shown is numerous. It requires expanding and collapsing function when clicked to accommodate the data and it accomplishes this using a collapsible card view. The list data is homogeneous as they share the same template file. Recycler view is used to display sleep list and sport statistics list. This is because both list data are long, and they all share the same template.

Expandable list view is used when the data to be shown is variable. It has no expanding and collapsing when pressed functionality. The list data share the same template, yet the number of data may be different for each list. Expandable list view is used for music playlists and sport list. This is because both lists may vary in size, yet the list data share the same template.

The app also provides sort functionality for the different lists. This function is generally implemented using spinners and a button. The first spinner chooses the sort type while the second spinner choose the sort order. The button is used to validate the choice.

For the add/edit functions of the app, the user is generally taken to a new activity to edit their data before adding it to the app. The two exceptions are add new song, where the user is redirected to an external file manager to find the song file, and add/edit sport type, where a dialog is called as we only process two lines of data which cannot justify the creation of a new activity. The add function is usually called with the floating action button or a normal add button. The edit function is usually called using the edit image button or normal edit button.

For the deletion function of the app, a dialog box is always called to validate the choice. This is to ensure that users do not accidentally delete their data by a mis click. The delete function is usually called with the delete text button or normal delete button.

Motivation

My motivation to make the app is so that I can make a difference in the world. I want to be able to help even a single person in improving and maintaining their health and mental health. I understand how the average user cannot easily notice a pattern by looking at data. So, I decided to implement views such as lists and charts so that the users can more accurately visualize the data and notice a pattern or trend.

Other than that, I am also motivated to make the app because I can improve my programming skills. The proposed ideas in the app are quite difficult and may prove a challenge to me. However, if I manage to complete the app, I will gain valuable experience and knowledge, and this may help me in my professional life.

Furthermore, this app would also help in enriching my CV. The app is quite difficult and if completed can be proof of my programming dedication and skills. Its inclusion into my CV may help in increasing my desirability to employers as it helps me to stand out from the other aspiring programmers.

Finally, I am also motivated to complete the app to get good marks in the subject. The app is quite advanced and if completed can help to secure a good mark in the module and help advance my studies.