Mood Monitoring App: Personalized Prediction For Essential Fulfillment

Report Name	Project Outline
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1 Project description

Low fulfillment of needs, such as social interaction, have a been studied to have an negative effect on individuals happiness [1]. This happiness then has correlation to health [2] on the same level as obesity or smoking [3]. By identifying and communicating what needs corresponds to the most happiness personalized for each individual could positively affect their health and well-being.

With this android app it collects daily data from a user on how they feel about their day (mood of the day) and various questions on needs and how well they have fulfilled them. Example questions can be on: social, sleep, movement. The user will rate the question on a scale from 1 to 5. With this data the app will use machine learning and statistics to understand the user. Then visualize its prediction and analysis for the user, they can better understand themselves and get an insights to what needs they could focus on to increase their general happiness.

There are differences between individuals depending on various factors: age, gender, and background, to name a few. Some might have a better day when they fulfilled their needs on movement, while others might have better day when they have socialized. By also allowing the user to add new needs, the app can be more flexible for other types of people. Examples needs a user could add: video game time or spirituality.

This makes this app different from most other health applications, such as Samsung Health [4] or Huawei Health [5], is that generally focus on completing a pre-set goal(e.g. 7000-10,000 steps a day). This app will be be more personal by asking questions subjectively and entrusting the user reflect on their day while answering the questions. Different people will rank their question differently. A "Couch-potato" might feel fulfill in movement/exercises from walking to the shop, while an frequent runner might not fell as fulfilled from the same activity.

In addition to the app described above, the app can have an additional a opt in service for the user to share their data with the public, anonymously, where analysis on a wider population can be done. These reports could then be accessed through the app, or through other methods such as a dedicated website, a twitter bot (Similar to the twitter bot: @GWASbot [6]) that post regularly analysis, or access through an API for researchers to run their own studies.

By allowing for remote storing for the collected data there must require more data management and data security for the users to keep their anonymity and re-access their own data.

To sum up this android application will help the user better understand themselves on how to increase their overall happiness by analysing fulfillment on a set of needs. Then by using machine learning we can predict what need is more important for the user to focus on to be happy. By allowing for collecting and running the similar methods on a multiple users it has the possibility to get a better insight into to the needs of a larger population and observe how the various needs changes throughout a time-period.

2 Proposed tasks

For this project I will set up a private github repository for version control, backups, and allowing for working and accessing on multiple workstations. Then by using kanban I will better structure and streamline what tasks needed to be focus on while using a general plan. This allowing for flexibility to adapt to changes problems that takes place throughout the development.

For the project I need to investigate how to make the application, the straight forward method will be to use kotlin and android studio, but there might be software that can create a more suited for my project, maybe making a web style application instead.

For the statistics I will have to investigate what methods that is best suited, and what machine learning method is best suited. Currently naive bayers seems to be ideal, with is quick

compatibility and importance based on the weights. A tree classifier could also work, but communicating the analysis might be to complicated.

Remote data management and security should also be investigated, what database to use, how to log in, allowing for deletion of data. Should other factors be stored such as gender and age to allow study on these factors? Also within this scope would be where to host the service, possibilities would be to host it through the university, rent a service, or hosting on a personal computer.

Researching before selecting a set of needs that will be a default to used and analysed by the app to predict mood of the user. The list should not be to long as this could overwhelm the user.

3 Project deliverables

Underneath is a general deliverable plan for the project and when to expect key parts. It is not a set plan and with the use of Kanban it may identify that some tasks needs to be extended or takes less time than initially expected.

Week 5-6(By 12th February): First weeks of this project will be to research possible tools, set up working directories (private github repositories), selecting default set of needs, and sketch out an example of the app to get grasp on the UI.

Week 7 (By 19th February): Next would be to start putting together a simple draft of the app, making the UI, placeholders for the coming statistics and features.

Week 8 (By 26th February): Then adding the functionalities, where the user can answer the questions, view theirs statistics, and store the answers in a local database.

Week 9-10 (Before Demonstration): By this time the application should be functional for personal use and ready to be showcased as the Mid-project demo in the spans week 9-10. Therefor, over these weeks will be fixing bugs and improving design, making it ready for the demonstration.

Week 15 (By 6th April): Depending on the research on what and where to store the remote database, setting it up and integrating it with the app and setting up one of the methods of accessing the population data. That will be the focus of the next full work-week.

Week 16-17 (By 30th April): The two last weeks before report submission, will be focus on fleshing out the project, fixing and refactor the code, and making the main report ready for submission.

Annotated Bibliography

[1] V. L. Buijs, B. F. Jeronimus, G. M. Lodder, N. Steverink, and P. de Jonge, "Social needs and happiness: A life course perspective," *Journal of Happiness Studies*, pp. 1–26, 2020.

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[3] J. Holt-Lunstad, T. B. Smith, M. Baker, T. Harris, and D. Stephenson, "Loneliness and social isolation as risk factors for mortality: a meta-analytic review," *Perspectives on psychological science*, vol. 10, no. 2, pp. 227–237, 2015.

[4] Samsung Electronics Co., Ltd., "Samsung health [mobile app]," April 2015, accessed February 2021.

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[6] A. Ganna, "Twitter bot: Gwasbot," https://twitter.com/SbotGwa, July 2018, accessed February 2021.

Example of method of automatically publishing analysis .