Depression detection system

CS691

February 2023

Agenda

Product Description

This section aims describe project and aim to establish project objectives.

Business analysis /Personas

In this section we attempt to describe current business environment as well as personas

Problem Description

In this section we will describe problem faced by our potential users

Technology Description

With this section we aim to describe technologies that are going to be used for this project

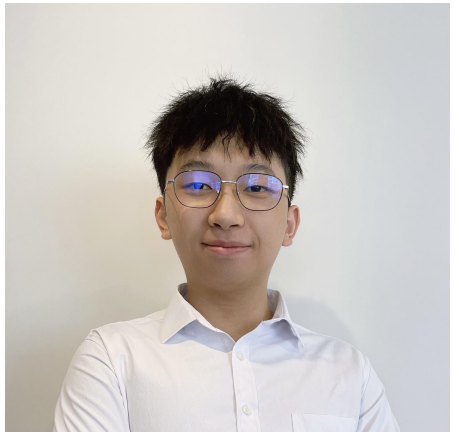
Project Schedule

While, project schedule might be subject to change, we attempt to outline major keystones for this project.

Our team

Artem Kolmogorov

Project Manager & Developer



Yuxiang Liu

Developer

Shivani Chavan

Developer

Wangbo Gu

Developer

Omkar Shitole

Developer & DBA

Siddarth Ravirala

Developer

Problem Statement

Depression is a mental illness that affects millions of people worldwide. Early detection of depression is crucial for the effective treatment of the condition. However, traditional methods of detecting depression, such as self-report questionnaires or clinical interviews, can be subjective and unreliable.

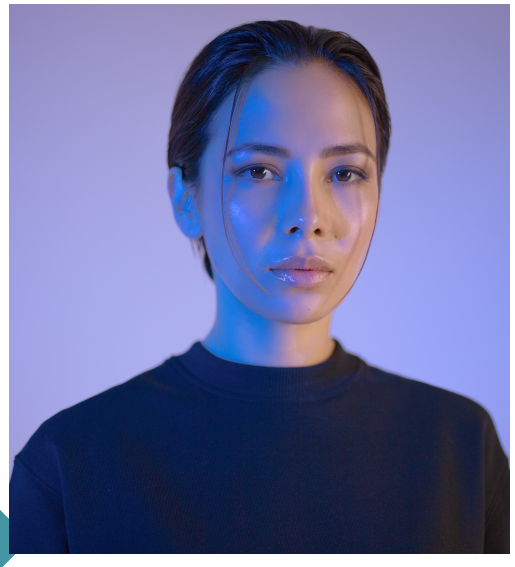
Leading to mental illness, depression has also been connected to an increased risk of premature death. Additionally, it significantly contributes to suicidal thoughts and affects daily functioning. Around the world, 300 million people—or one in every 15 adult each year suffer from depression.

Project Description

Our detection system will be trained by a unique dataset for depression faces from messages and images. We believe that certain linguistic traits can be examined and linked to possible depressive symptoms as well as used to forecast self-destructive behaviour. The training result we want is that the system can analyse the input (messages, images, and video) from users, and detect the type of depression such as anxiety, bipolar, or paranoia. Finally, the possibility of different depressions that the person might have will be provided.

Personas

Sarah



Profile

Sarah, a 25-year-old graphic designer who has been feeling down for the past few months. Despite her successful career and supportive friends and family, she feels unfulfilled and struggles to find joy in her everyday life. She wants to find a way to manage her depression and is open to using technology to help her do so.

Name: Sarah

Age: 25

Location: Los Angeles, CA

Job: Graphic Designer

Salary: 66 000 – 70 000$/annually

Family: Single

Interests

- Writing own comic books
- Everyday swimmer
- Loves animals
- Watching series

Frustration

- Traffic in Los Angeles area
- Living alone for a long time

Goals

- Buying her own house
- Building lifelong relationships
- Finding friends

Personas

Jack

Profile

Jack, a 35-year-old software engineer who has a history of depression and anxiety. He often finds himself feeling overwhelmed at work and is struggling to balance his job and personal life. He wants to find a way to manage his symptoms so that he can be more productive and happier.

Name: Jack

Age: 35

Location: Chicago, MI

Job: Software Engineer

Salary: 92 000 – 110 000$/annualy

Family: Single

Interests

- Riding Bike
- Goes Kayaking
- Attending live concerts

Frustration

- Managing depression
- Wants to change job, but unable

Goals

- Moving to south
- Finding friends
- Buying a bigger house

Personas

Lisa

Profile

Lisa, a 40-year-old stay-at-home mom who is feeling overwhelmed and exhausted. She is struggling to keep up with the demands of taking care of her children and household, and she often feels like she is failing as a mother. She wants to find a way to manage her stress and feelings of inadequacy.

Name: Lisa

Age: 40

Location: New-York, NY

Job: Unemployed

Salary: N/A

Family: Married, two kids

Interests

- Reading romantic novels
- Going for beach holidays
- Loves animals
- Watching series

Frustration

- Her husband going for a long business trip
- Having troubles with her kids

Goals

- Taking dog from shelter
- Helping kids with college

Personas

Tom

Profile

Tom, a 50-year-old small business owner who is feeling stressed and burnt out. Despite the success of his business, he is feeling overwhelmed by the responsibilities and pressure of running it. He wants to find a way to manage his stress and anxiety so that he can enjoy his success and have a better work-life balance.

Name: Tom

Age: 50

Location: Austin, TA

Job: Self-Employed

Salary: 150 000 $/annually

Family: Divorced

Interests

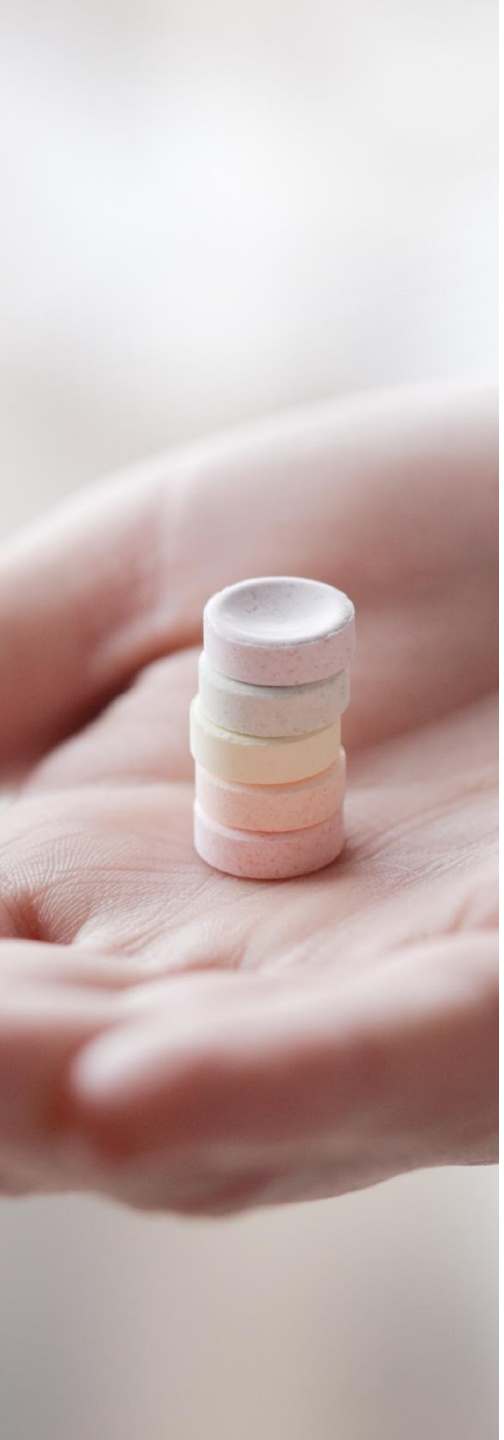
- Going hunting & fishing
- Taking rides in his chopper

Frustration

- Declining business profits
- Having health problems

Goals

- Building strong portfolio for his 401-k
- Finding new friends



Business Analysis

MHealth apps are wearable devices and health tracking apps used to monitor and share health information by using mobile technology. mHealth apps include clinical and diagnostic apps, remote monitoring apps, healthy-living apps, clinical reference apps, and productivity apps. These apps are used to monitor and collect community data and clinical data by healthcare providers.

Health App use

64%

(of adults in US)

mHealth Market

56.77b.$

(globally)

Market Growth

+25%

(CAGR)

Increasing publicity of mHealth applications due to their increasing benefits to improving patient disease state is expected to propel the growth of the mHealth apps market. Many people are increasingly adapting to the usage of health apps and therefore their popularity is increasing. These apps provide many benefits to monitoring patient disease state.

Increasing awareness to adopt medical applications among the patients and healthcare professionals for better communication and healthcare outcomes is helping in boosting the segment share. In addition, long-term use of subscribed medical applications by the patient and physicians is also one of the major factors expected to drive the segment. In addition, increasing preference for medical applications to manage chronic disease conditions is propelling segment growth.

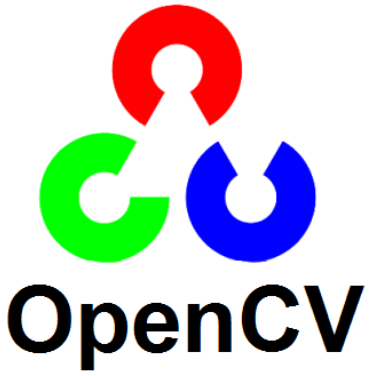
Monetization

There are several ways to monetize this depression detection app in the future:

1. Subscription-based model: Users can be charged a monthly or annual fee for access to the app's features and services.
2. In-app purchases: Users can purchase additional features or services, such as personalized coaching or counseling sessions, within the app.
3. Advertising: The app can display targeted advertisements to users based on their depression status or other relevant information.
4. Partnerships with healthcare providers: The app can partner with healthcare providers to offer users access to mental health services, such as therapy or medication management. The healthcare providers can pay a fee to the app for referring patients.
5. Licensing agreements: The app can license its technology and algorithms to other companies, such as healthcare providers or insurance companies, for use in their own products and services.
6. Data monetization: The app can monetize the data it collects from users by selling it to companies for market research or for use in developing new products and services. However, it's important to ensure that user privacy is maintained and that the data is collected and used in a responsible and ethical manner.

Note: It's important to consider the regulations and laws that apply to mental health apps, such as the Health Insurance Portability and Accountability Act (HIPAA) in the US, when developing a monetization strategy for this app.

Technology & Algorithms



Technology & Algorithms

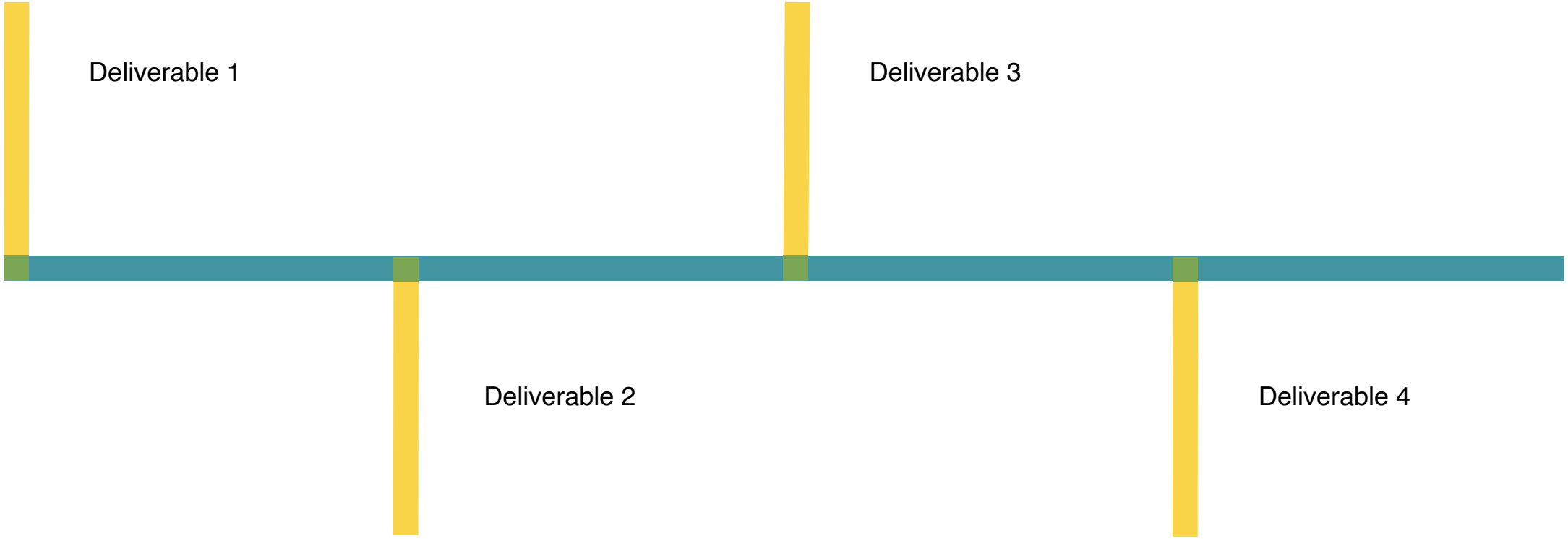
Machine Learning model

1.Data collection
2.Data pre-processing
3.Feature extraction
4.Model selection
5.Model training
6.Model evaluation

Deployment

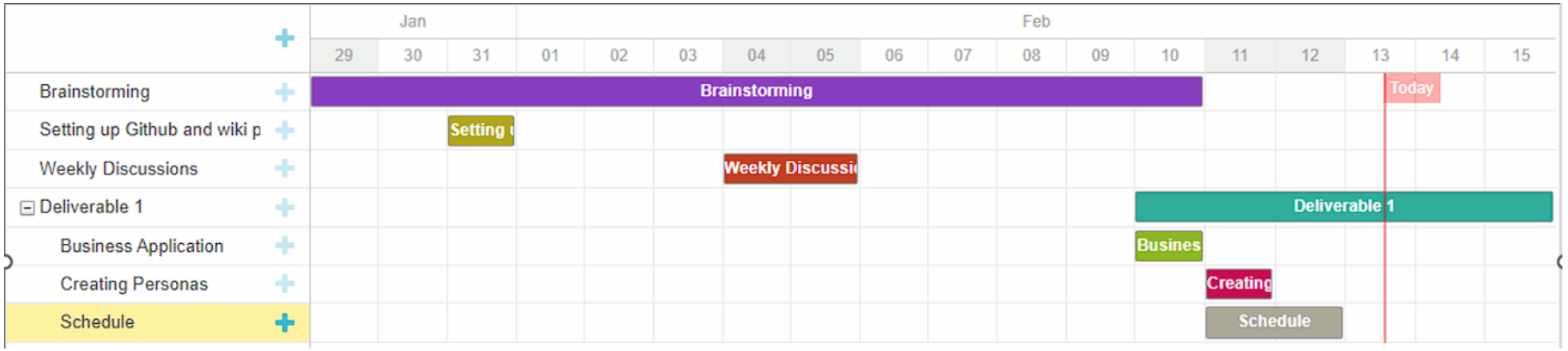
1.Data collection

Project Timeline

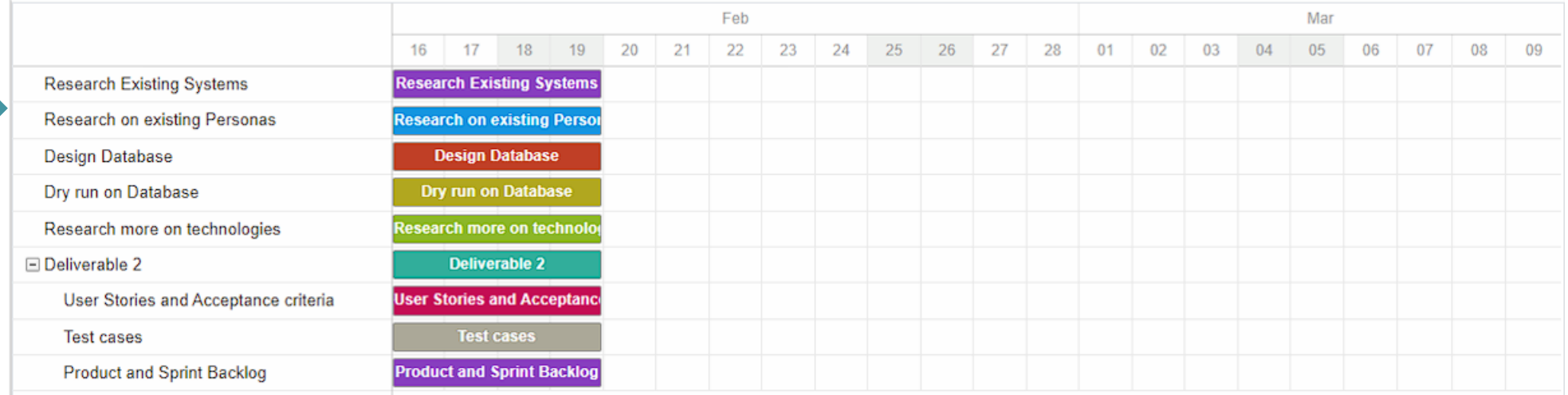


Project schedule

Sprint 1



Sprint 2



Project schedule

Sprint 3

	Mar				Apr	
	6 - 13	13 - 19	20 - 26	27 - 2	3 - 9	10 - 16
Draft Technical Paper						
Train ML model						
Test ML model						
Turning ML model into Application						
⊟ Deliverable 3						
Draft Document on design, technologies,etc.						

Sprint4

	Apr																		May		
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	01	02	03
Finish Application Development																						
Finish Project Demo																						
Finish Technical paper																						
Deliverable 4																						

Teamwork agreement

Team Agreement

Communication

- The team will communicate with each other through a variety of channels. For weekly meetings for meaningful team discussions, zoom meetings will be used. All the team members are highly encouraged to keep their cameras on, which will be able to build trust between the team members and reflect transparency;
- To discussion regarding minute details and doubts or anything urgent, a Whatsapp messenger group will be used.
- To share the final deliverables, Google docs will be used where all the team members can edit the document.
- A common platform called Trello has been set up for all team members, where designated groups have been created, such as Developers, Business Analyst, Product Owner.
- Database management, bugs, attendance, weekly -plan, and meeting minutes. This manages all the bits and pieces of the project and makes the project management efficient.

Work division and Participation

- The entire project work should be divided into equal parts, and equal responsibilities should be given to all the team members.
- Each team member should complete their division of work before the deadline. If they are unable to complete the work on time, that hinders the performance of the entire team. If in case a team member is facing trouble and issues at some point, they can share it with others so that they can help each other and complete the work before the deadline.
- All the team members are expected to attend the meetings promptly.
- Absence during multiple meetings will affect the team's performance and efficiency. The team member can discuss beforehand with the team leader if he/she is going to miss the meeting or make it up for it before the next meeting is scheduled.
- Work is separated between members of the group separated voluntary, however if members lacks participation product owner is entitled to assign necessary tasks to absentee members.
- In case member is absent during meetings, member pledges to support whichever decision is approved during that meeting.

Meetings

- All the team members will meet on zoom virtually every Tuesday and Friday. All the team members have to be present, as attendance is mandatory unless there is an exceptional case.
- The team leader would be responsible for sending meeting details and conducting the meeting.
- A meeting track or meeting minutes report would be listed after every meeting to keep track of the project and its progress.
- Every team member is expected to come u with ideas, participate in the discussion, and give an update on their progress for their part of the work.

Respect

- Making sure all team members always have chance to share their opinion

- All members agree to respect each others personal time and try not bother members during night time unless it is urgently required by the project.

Team Member	Email
Shivani Chavan	shivani.chavan@pace.edu
Yuxiang Liu	yl26417p@pace.edu
Omkar Shitole	os33654n@pace.edu
Wangbo Gu	wg10154n@pace.edu
Siddharth Ravirala	sr64139n@pace.edu
Artem Kolmogorov	ak71778n@pace.edu

Retrospective

What went well?

- We as a team have planned to keep our objective simple to finish and produce what was expected.
- Team had good time working together.
- Active response from team to get involved in tasks with clear thoughts.
- The key was participation and motivation to complete task in time and every member knew what they had to do.
- We had several discussion sessions.
- Overall, every meeting session is effectively used to gain progress and complete sprint on time.

What Could Be Improved?

- We frequently try to communicate to discuss about project and advancements even after the sprint completion.
- Setting up time limit for the tasks and learning from previous semester student's sprints performance to make improvements and where can we be better.

What we plan to commit for next sprint?

- Maintain consistency in performance, improvement is key.
- Previous students sprint retro can be helpful for improving team balance in which areas team is lacking, where we can work according to that.
- Previous retro stats can be helpful in filling the gaps of next sprint.

Group wiki page link

https://github.com/htmw/2023S-Team2/wiki

Summary

This app has the potential to revolutionize the way we detect and treat depression. By leveraging the power of machine learning algorithms, it offers a more objective and reliable way to assess a person's mental health status. With its personalized recommendations and commitment to user privacy, this app has the potential to make a positive impact on the lives of millions of people who suffer from depression.

Thank you