BSc (Hons) Computing Course 2025/26

Level 6 Production Project

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Course: BSc (Hons) Computing	**Supervisor's Name:**

Final Project Individual Aim & Objectives

Title of my Project: AI-Based Mental Health Companion for Students

Aim of my Project: This project will focus on creating and engineering an AI-driven mental health companion to enhance student well being, through excellent conversational and mood monitoring as well as tailored self-care advice. The system is expected to assist students in coping with stress, anxieties, and emotional issues. This project is not aimed at substituting professional mental health services, but only the creation of a working prototype.

Objectives of my Project:

Main Objective:

To come up with an AI-based mental health companion that helps students maintain their well being by conversational AI and emotional monitoring.

Sub-Objectives:

1. To create an interface that is easy to use in interacting with students.
2. To apply the technique of AI-supported conversational support based on the NLP technique.
3. In order to add mood tracking and emotional pattern analysis functions.
4. In order to use Agile approach to deliver iterative development and feedback.
5. To measure system usability and efficiency.

Specification of my Product:

Functional and Non-Functional Activities (MoSCoW)

Functional Requirements

Must Have

- Secure system of user authentication and secure login.
- Conversational interface with AI companion textually.
- Mood tracking: This is done through various input modes (text, emoji, rating scales) and is performed on a daily basis.
- Simple emotional pattern investigation and trend visualisation.
- End-to-end data encryption of storage.

- Disclaimers and crisis helpline information put up.

Should Have

- Mood history-based personalized self-care recommendations.
- Mood trend and insight interactive dashboard.
- Several conversation topics/ themes (academic stress, social issues, overall well-being).
- Achievement badges (elements of gamification) and progress tracking.
- Mood data (PDF/CSV format) export capabilities.

Could Have

- Connection to academic calendar to notify about the stress-point.
- Voice input/output functionalities to accessibility.
- Group support features (anonymous peer sharing)
- Modern analytics based on machine learning forecasts.
- Multi-language support

Won't Have

- Professional counselling or a crisis intervention which is live.
- Clinical diagnosis abilities.
- The human moderator intervention is real-time.
- Medical advice or prescription.
- External medical record integration.

Non-Functional Requirements

- **Performance:** System response time <3 seconds per interaction.
- **Usability:** Intuitive navigation; accessible design (WCAG guidelines).
- **Security:** End-to-end encryption of sensitive information, no personal health information is stored with no prior authorization.
- **Reliability:** 99% uptime during testing phase.
- **Scalability:** Modular architecture to allow future feature addition.

Research: Academic pressure, social issues, and lifestyle change have become critical issues that have impacted student mental well being. Conventional mental health support systems are usually limited by factors such as accessibility, long wait time and stigma. Mental health companions that can be powered by AI are an alternative to manual support because they provide constant, confidential, and convenient assistance. These systems are able to mimic an empathetic conversation and offer personalized coping mechanisms using natural language processing and machine learning. Studies show that artificial intelligence companions may assist the user to be more conscious of the emotional patterns and promote healthy mental habits. Such systems are often developed using agile because of the changing user requirements and ethics. The current project examines the available AI mental health applications and uses Agile methodology to build and test a mental health companion aimed at students in a cyclic fashion.

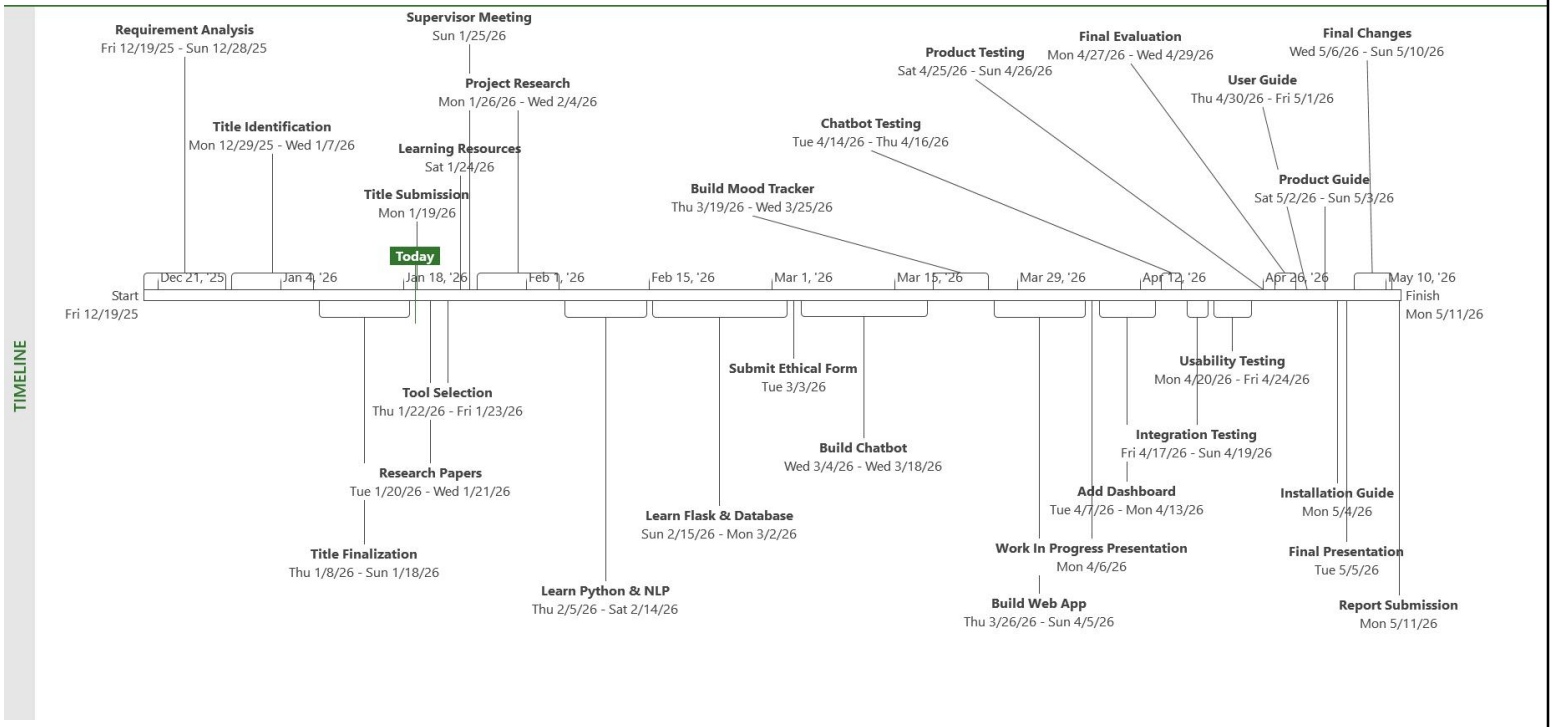
The study conducted by Fitzpatrick et al. (2017) shows that conversational AI-based agents, like Woebot, can be used successfully to provide cognitive behavioral therapy (CBT) to young adults to alleviate the symptoms of depression and anxiety by means of automated, empathetic conversations. It helps to justify the feasibility of AI companions in the form of stigma-free and easily accessible mental health tools among students.

Evaluation: The project will be measured using the usability, functionality and user satisfaction. Functional testing the basic functionality like chat interaction, mood tracking, and recommendations should be checked to ensure that they are functional. The usability test will be done by administering surveys and observation to the students. The system will also be improved by using feedback that is gathered during Agile sprint reviews. Such performance measures as response time and system reliability will also be assessed. The analysis will determine strengths, weaknesses and improvement opportunities to be made in the future to ensure that the system fulfills the desired objectives.

Project Planning & Methodology

Project Planning: Once the research is finished, the project is developed in iterative sprints on the basis of Agile. Every sprint is aimed at the provision of features that can be used, test them and improve them in terms of the feedback. The time required on the project is 12 weeks.

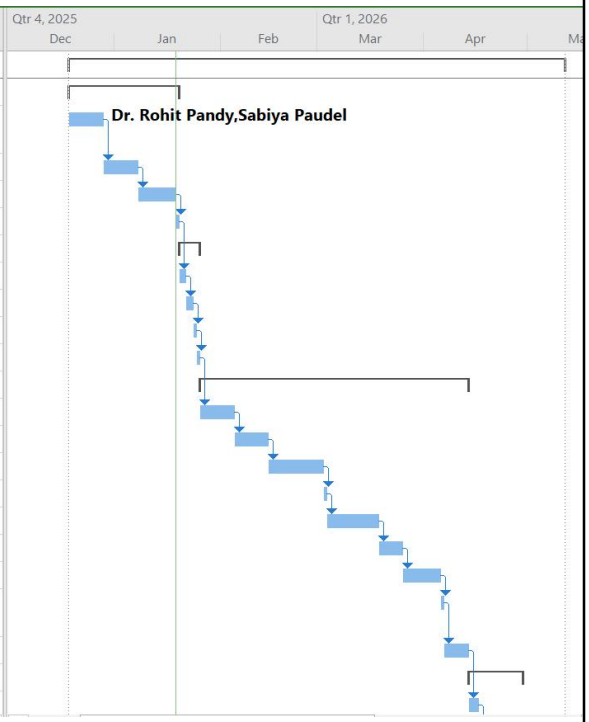
Project Timeline



Gantt chart

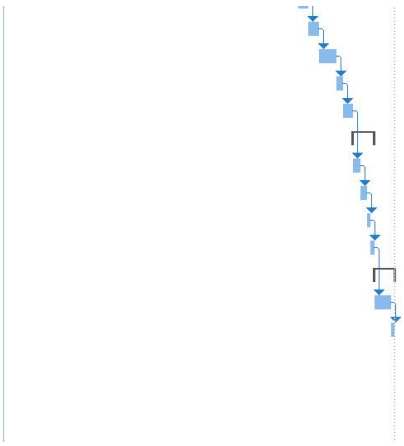
GANTT CHART

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Project**	**144 days**	**Fri 12/19/25**	**Mon 5/11/26**	
2		**Initiation**	**32 days**	**Fri 12/19/25**	**Mon 1/19/26**	
3		Requirement Analysis	10 days	Fri 12/19/25	Sun 12/28/25	
4		Title Identification	10 days	Mon 12/29/25	Wed 1/7/26	3
5		Title Finalization	11 days	Thu 1/8/26	Sun 1/18/26	4
6		Title Submission	1 day	Mon 1/19/26	Mon 1/19/26	5
7		**Planning**	**6 days**	**Tue 1/20/26**	**Sun 1/25/26**	
8		Research Papers	2 days	Tue 1/20/26	Wed 1/21/26	6
9		Tool Selection	2 days	Thu 1/22/26	Fri 1/23/26	8
10		Learning Resources	1 day	Sat 1/24/26	Sat 1/24/26	9
11		Supervisor Meeting	1 day	Sun 1/25/26	Sun 1/25/26	10
12		**Development**	**78 days**	**Mon 1/26/26**	**Mon 4/13/26**	
13		Project Research	10 days	Mon 1/26/26	Wed 2/4/26	11
14		Learn Python & NLP	10 days	Thu 2/5/26	Sat 2/14/26	13
15		Learn Flask & Database	16 days	Sun 2/15/26	Mon 3/2/26	14
16		Submit Ethical Form	1 day	Tue 3/3/26	Tue 3/3/26	15
17		Build Chatbot	15 days	Wed 3/4/26	Wed 3/18/26	16
18		Build Mood Tracker	7 days	Thu 3/19/26	Wed 3/25/26	17
19		Build Web App	11 days	Thu 3/26/26	Sun 4/5/26	18
20		Work In Progress Presentation	1 day	Mon 4/6/26	Mon 4/6/26	19
21		Add Dashboard	7 days	Tue 4/7/26	Mon 4/13/26	20
22		**Testing**	**16 days**	**Tue 4/14/26**	**Wed 4/29/26**	
23		Chatbot Testing	3 days	Tue 4/14/26	Thu 4/16/26	21



GANTT CHART

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
24		Integration Testing	3 days	Fri 4/17/26	Sun 4/19/26	23
25		Usability Testing	5 days	Mon 4/20/26	Fri 4/24/26	24
26		Product Testing	2 days	Sat 4/25/26	Sun 4/26/26	25
27		Final Evaluation	3 days	Mon 4/27/26	Wed 4/29/26	26
28		**Documentation**	**6 days**	**Thu 4/30/26**	**Tue 5/5/26**	
29		User Guide	2 days	Thu 4/30/26	Fri 5/1/26	27
30		Product Guide	2 days	Sat 5/2/26	Sun 5/3/26	29
31		Installation Guide	1 day	Mon 5/4/26	Mon 5/4/26	30
32		Final Presentation	1 day	Tue 5/5/26	Tue 5/5/26	31
33		**Closing**	**6 days**	**Wed 5/6/26**	**Mon 5/11/26**	
34		Final Changes	5 days	Wed 5/6/26	Sun 5/10/26	32
35		Report Submission	1 day	Mon 5/11/26	Mon 5/11/26	34



Methodology: Agile methodology (Scrum) is employed in this project because it is flexible and iterative in nature. Agile enables constant enhancement by use of short development cycles referred to as sprints. A sprint consists of planning, testing, review, and development. The user feedback is obtained on a regular basis to improve the usability and performance of the system. The Agile approach can be applied to the mental health domain as the requirements of the users are constantly changing, and ethics has to be reconsidered regularly. Agile is supported with literature in relation to the creation of user-centric software development systems that have evolving requirements.

Agile is especially appropriate to mental health applications because of the changing needs of users as well as ethical concerns. According to Hassan and Ali (2020), the Agile permits an iterative feedback and adaptive development, which is crucial in sensitive areas, such as mental health where user confidence and reliability of the system are the keys.

Resources

Hardware

Item	Specification	Source
Development Computer	Laptop/Desktop with minimum 8GB RAM, 256GB SSD	Own
Testing Devices	Smartphone (iOS/Android) for mobile testing	Own
Server Hosting	Cloud server for deployment (AWS/Azure free tier)	Cloud Provider

Software

Item	Version/Purpose	Source
IDE	Visual Studio Code / PyCharm	Free Download
Programming Language	Python 3.9+	Open Source
NLP Libraries	NLTK, spaCy, Transformers	pip install
Web Framework	React (Frontend), Flask (Backend)	npm/pip install
Database	MySQL / MongoDB	Open Source
Version Control	Git & GitHub	Free
Design Tools	Figma (UI/UX prototyping)	Free tier
Project Management	Trello/Asana for Agile tracking	Free tier

Human Resource

I am working on my Project with the following people

Name: Sabiya Paudel	**Role: not needed**
	Module Leader Supervisor

Initial Bibliography

1. Fitzpatrick, K.K., Darcy, A. and Vierhile, M. (2017) 'Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent (Woebot): A randomized controlled trial', JMIR Mental Health, 4(2), p. e19.
2. TensorFlow (2022) TensorFlow: An end-to-end open source platform for machine learning. Available at: https://www.tensorflow.org (Accessed: 19 January 2026).
3. Vaidyam, A. et al. (2019) 'Chatbots and conversational agents in mental health: A review of the psychiatric landscape', Canadian Journal of Psychiatry, 64(7), pp. 456-464.
4. World Health Organization (2021) Mental health of adolescents. Available at: https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health (Accessed: 19 January 2026).
5. Information Commissioner's Office (2021) Guide to the General Data Protection Regulation (GDPR). Available at: https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr (Accessed: 19 January 2026).
6. Hassan, A., & Ali, R. (2020). Agile methodology in software development: A systematic literature review. International Journal of Advanced Computer Science and Applications, 11(7), 1–8. https://doi.org/10.14569/IJACSA.2020.0110701

Risk Register (AI-Based Mental Health Companion for Students)

ID	Risk Category	Risk Description	Likelihood	Impact	Severity	Owner	Mitigation (Concise)	Status
1	Ethical & Legal Compliance	Violation of GDPR or mismanagement of sensitive mental information.	Medium	High	High	Sabiya Paudel	• Explicit user consent • No identifiable health data stored • Encrypted data storage • Clear privacy notice	Open
2	Over-Reliance on AI	The users can use the system as an alternative to professional mental health assistance.	Medium	High	High	Sabiya Paudel	• Non-medical disclaimers • No diagnostic advice • Crisis helpline display	Open
3	NLP Model Bias	Chatbot can produce bias or improper answers.	Medium	High	High	Sabiya Paudel	• Use trusted NLP libraries • Diverse test inputs • Safe fallback responses	Open
4	Inaccurate Mood Tracking	Mood recognition can be erroneous because of ambiguity in the input.	Medium	Medium	Medium	Sabiya Paudel	• Multiple input modes • User correction option • Indicative insights only	Open
5	User Engagement Drop-off	The users might lose interest after first being used.	High	Medium	High	Sabiya Paudel	• Simple UI design • Gamification features • Personalised feedback	Open
6	Usability Issues	User interface can be complicated or not accessible.	Medium	Medium	Medium	Sabiya Paudel	• WCAG-guided design • SUS usability testing • Iterative UI refinement	Open
7	Technical Performance Issues	Slow response time or chatbot latency.	Medium	Medium	Medium	Sabiya Paudel	• Backend optimisation • Lightweight models • Performance testing	Open
8	Security Breach	Violation of access to the user accounts or data.	Low	High	High	Sabiya Paudel	• Secure authentication • Encrypted data transfer • Secure coding practices	Open
9	Project Timeline	The lateness caused by technical or	Medium	Medium	Medium	Sabiya Paudel	• Agile sprint planning • MVP-first delivery	Open

	Slippage	academic workload.					• Progress tracking	
10	Resource Limitations	Inadequate computer or software resources.	Low	Medium	Low	Sabiya Paudel	• Open-source tools • Free cloud tiers • Scope control	Open