

THRIVE

Mental Health Chatbot

Revolutionizing Emotional Support and
Mental Health Care

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Team Members

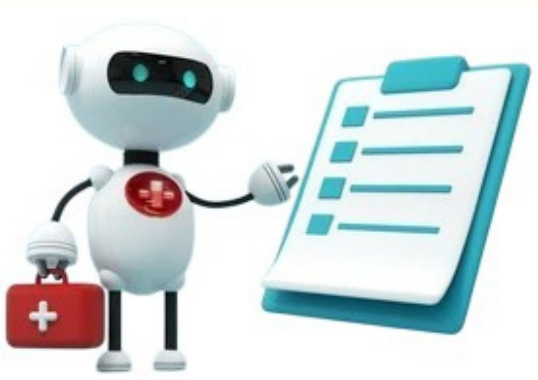


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Introduction

1

What is Chatbot ?

A chatbot is an AI-powered software program designed to simulate human-like conversations. It uses Natural Language Processing (NLP) and Machine Learning (ML) to understand user queries and provide relevant responses. Chatbots can assist with customer service, provide information, or offer emotional support, depending on their purpose

2

Importance of Mental Health Support

Mental health is vital for overall well-being, yet many face challenges like anxiety, depression, and stress without adequate support. Timely intervention, emotional support, and accessible resources are crucial in promoting mental wellness and preventing crises.

Problem Statement

- 1 Bridging Mental Health Gaps:** Providing immediate, accessible, and scalable support for individuals experiencing anxiety, depression, and stress.
- 2 Enhancing Mental Health Accessibility:** Overcoming geographical and social barriers by offering AI-driven, real-time mental health interventions.
- 3 Leveraging AI for Personalized Support:** Utilizing NLP and deep learning to deliver emotional insights and coping strategies for continuous well-being assistance.



Objective

- 1 Provide Empathetic and Accurate Responses:** Offer thoughtful, supportive, and medically accurate replies to ensure users feel heard, validated, and guided toward helpful strategies.
- 2 Detect Crisis Situations and Provide Helpline Information:** Identify distress signals in conversations and proactively share relevant crisis helpline contacts, ensuring immediate access to professional support.
- 3 Ensure a Seamless and Engaging User Experience:** Implement intuitive chatbot interactions, natural conversation flow, and user-friendly design to create a comforting and accessible mental health support system.



Dataset Overview

1

1. **Mental health faq for chatbot (kaggle)**: Contains frequently asked questions about mental health along with expert-written answers.
2. **NLP mental health conversations (kaggle)**: Simulates mental health conversations (user-message and counselor-response pairs).
3. **Psychology Dataset Split (huggingface)**: Includes categorized psychological responses and therapy-type questions for a broader coverage of mental health issues.

2

Combined Format (Merged2.csv)

After merging, your final dataset file typically has these columns:

- **Questions**: User-like mental health queries
- **Response**: Full detailed answer from one of the sources
- **Summarized_Response**: TF-IDF based summary (for faster retrieval)



Data Samples

QUESTIONS	RESPONSE
I feel like I'm not good enough.	You are enough just as you are. Self-worth isn't measured by achievements.
Why do I wake up feeling anxious?	Morning anxiety can be caused by stress or poor sleep quality. Try relaxation techniques before bed and a structured morning routine.
I'm feeling really anxious lately and I don't know why.	It's common to feel anxious at times, and there can be many reasons for it. Have there been any recent changes or stressors in your life that may be contributing to your anxiety? Let's work together to identify any triggers and develop coping strategies to manage your anxiety.



System Architecture

The mental health chatbot follows a three-stage pipeline:

1 Input Processing

- User inputs a query or concern.
- Text is preprocessed (tokenization, lemmatization, stopwords removal)

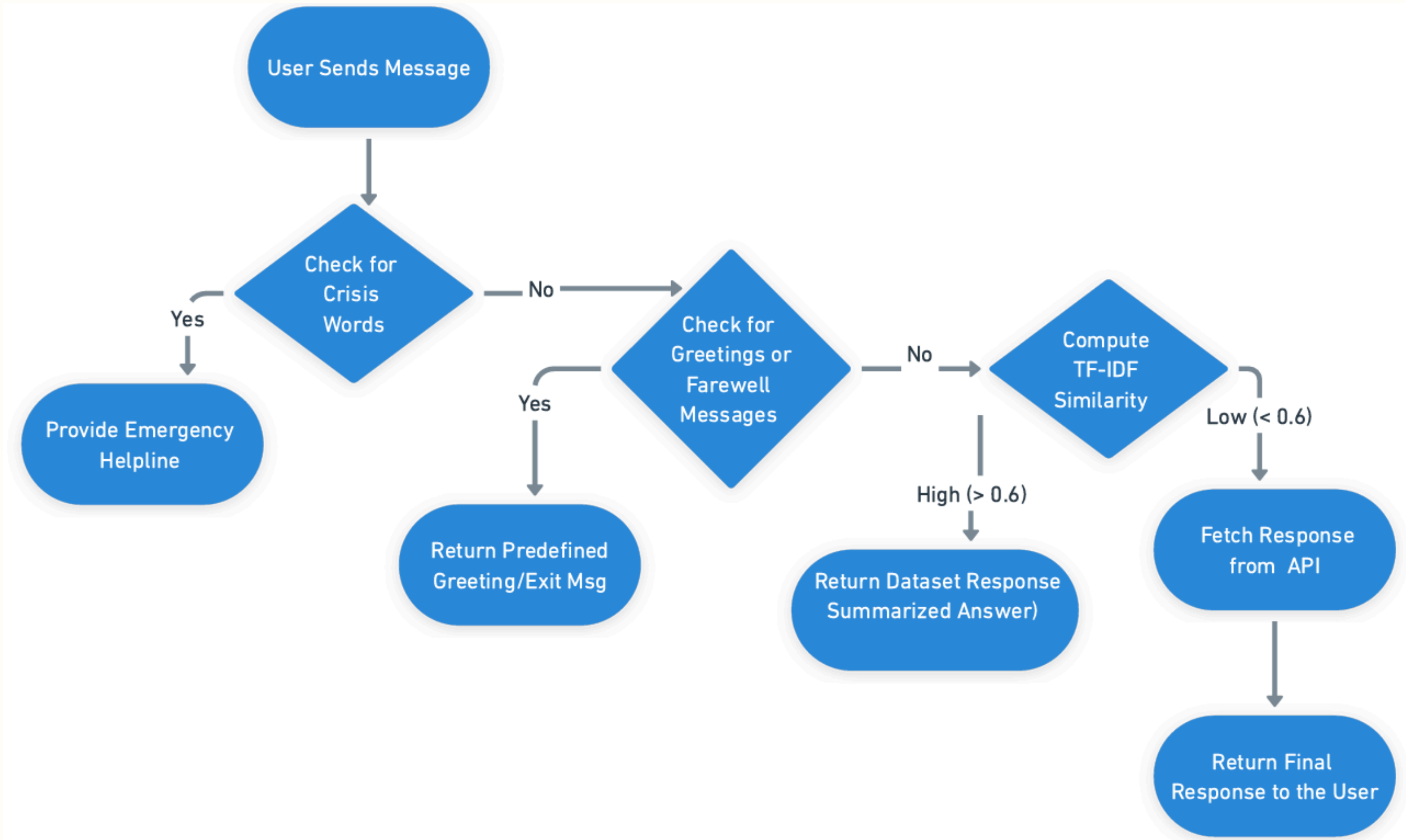
2 Response Selection

- If the message contains crisis keywords, the chatbot provides helpline details.
- If the query matches existing questions (TF-IDF similarity > 0.6), it returns a dataset response.
- Otherwise, it fetches a response from Google Gemini AI (Fallback Mechanism).

3 Response Generation

- The chatbot ensures responses are empathetic, concise, and medically accurate.
- Provides self-help suggestions or directs users to professional help when needed.

Flowchart



Models Used

1

Retrieval-Based Model: It selects the **most appropriate response** from a **pre-existing** set of responses by comparing **input similarity**

1. TF-IDF (Term Frequency-Inverse Document Frequency):

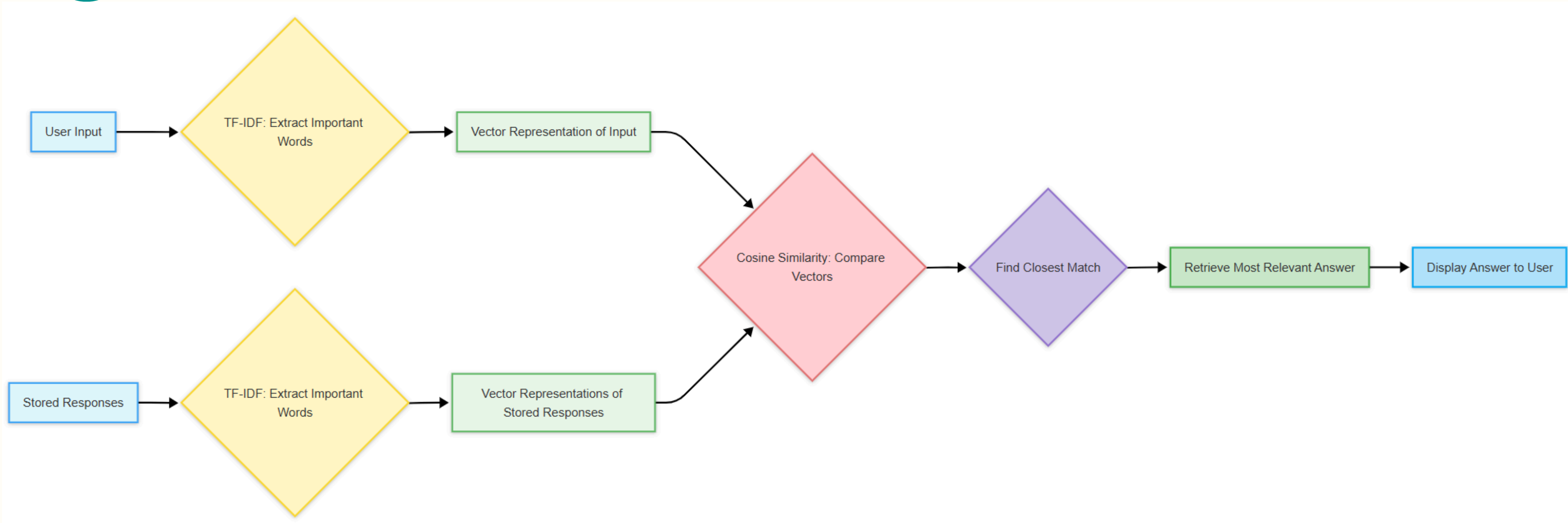
- Converts textual data into numerical values by giving importance to words.
- Helps to identify the most relevant words for comparison.

2. Cosine Similarity:

- Uses these numerical values to **compare** and find the most similar response.
- Cosine similarity measures the angle between two text vectors to determine how similar they are.
- A smaller angle means a better match, helping the chatbot pick the most relevant pre-existing response.

Models Used

Contd.



2

Generative-Based Model: Unlike retrieval-based, generative models **create new responses** word-by-word.

1. What is Google Gemini LLM?

Google Gemini is a **large language model (LLM)** designed for **understanding** and **generation** of natural language.

It is part of Google's AI advancements and is **trained on vast datasets** to **generate human-like, context-aware responses**.

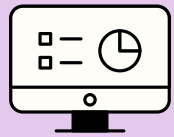
Gemini is capable of:

- Understanding complex queries
- Generating coherent and meaningful answers
- Engaging in multi-turn conversations (follow-up questions)
- Processing both text and multimodal inputs (text, images)

2. Why Choose Gemini?

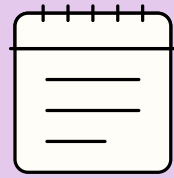
- Gemini excels in answering factual, or reasoning-based questions.
- It can handle Diverse and Complex Conversations without being restricted to stored responses.
- It can process a variety of inputs, making it useful for tasks like content creation, summarization, and problem-solving.

Proposed Features:



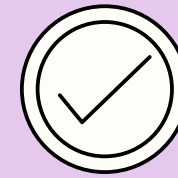
AI-powered chatbot for conversations

An intelligent and responsive chatbot designed for seamless user interactions.



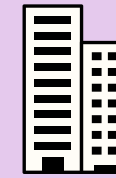
User-Friendly Interface

A simple and intuitive design ensures smooth and hassle-free conversations.



24/7 Availability

The chatbot remains accessible at all times for user queries. Always active, providing instant support anytime, anywhere.



Real-Time Responses

AI-driven quick and accurate replies, making interactions efficient and engaging.

Working Demo

Chatbot

i feel low

It's normal to experience emotional highs and lows. Try to identify what triggers these shifts and find healthy ways to manage them, like mindfulness or journaling.

i feel so angry

One strategy for managing anger is to practice relaxation techniques, such as deep breathing or progressive muscle relaxation. Additionally, it may be helpful to address any underlying issues that may be contributing to your anger, such as relationship problems or work-related stress.

Chatbot

how do i deal with my anxiety

Engaging in relaxation techniques like deep breathing, meditation, or journaling may reduce stress. If these feelings persist, seeking professional help from a therapist or counselor is a good step toward understanding and managing them.

i got very less marks on my tests , i feel so dissapointed in myself

I understand how disappointing it feels when you don't achieve the marks you hoped for on your tests; it's natural to feel disheartened. A helpful strategy is to practice **self-compassion**: treat yourself with the same kindness and understanding you would offer a friend in the same situation. Instead of dwelling on the negative, try identifying specific areas where you can improve and create a study plan focusing on those areas. Remember that setbacks are a part of learning, and you are capable of growth and improvement. You are not alone in feeling this way, and many people experience similar disappointments.



Future Scope



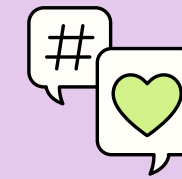
Multilingual Support :

Expanding language capabilities will allow Thrive to serve a more diverse global audience.



AI-Powered Voice Conversations:

Provide natural voice-based interactions for user convenience.



Mental Health Progress Tracking:

Allow users to log moods and visualize mental health trends over time.

Conclusion:

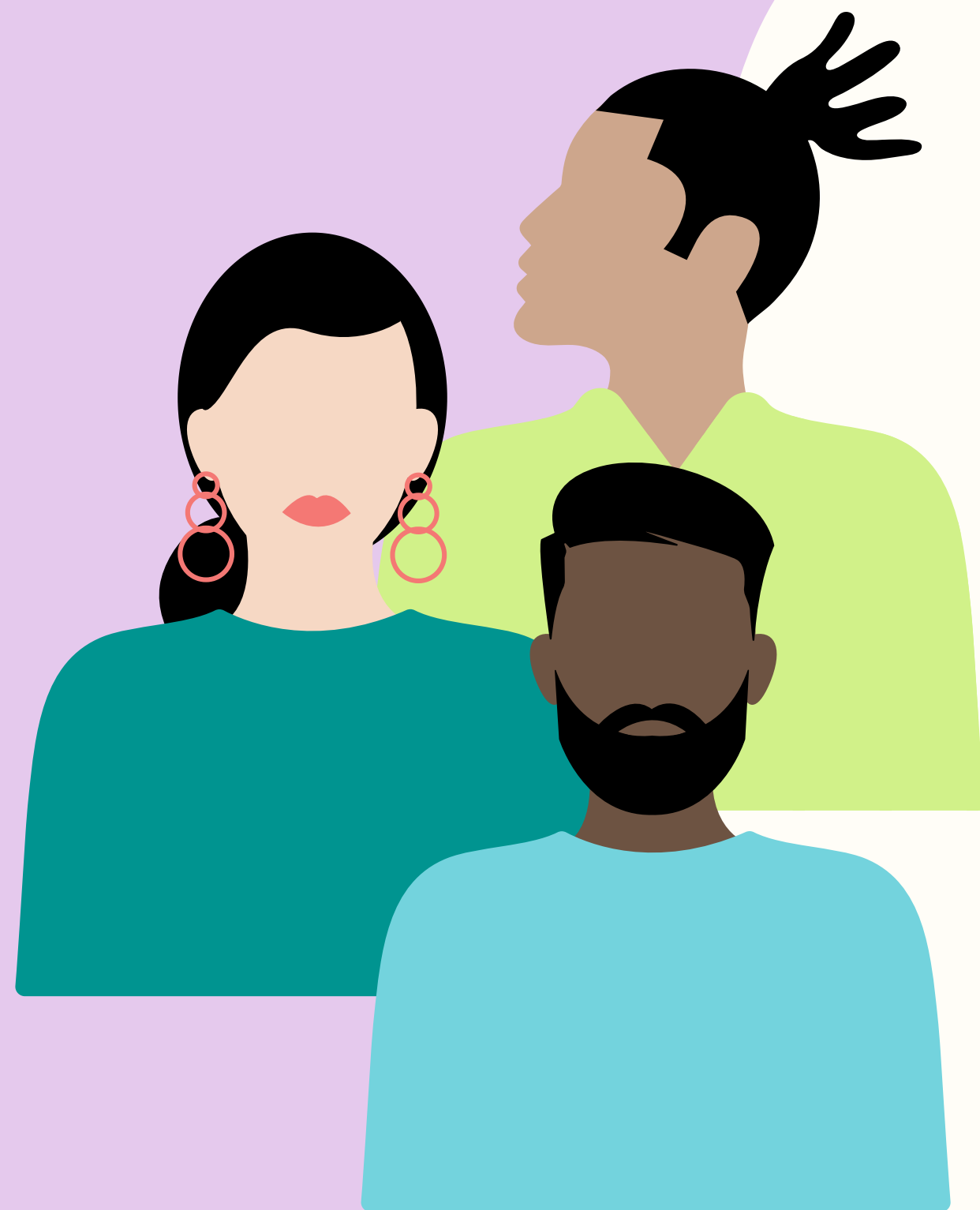
In today's fast-paced world, youth face rising stress, anxiety, and loneliness but often hesitate to seek help.

THRIVE, our mental health chatbot provides a safe, judgment-free space, offering 24/7 emotional support and insights into well-being. While not a replacement for therapy, it acts as a first step toward self-care, ensuring no one feels alone in their struggles.



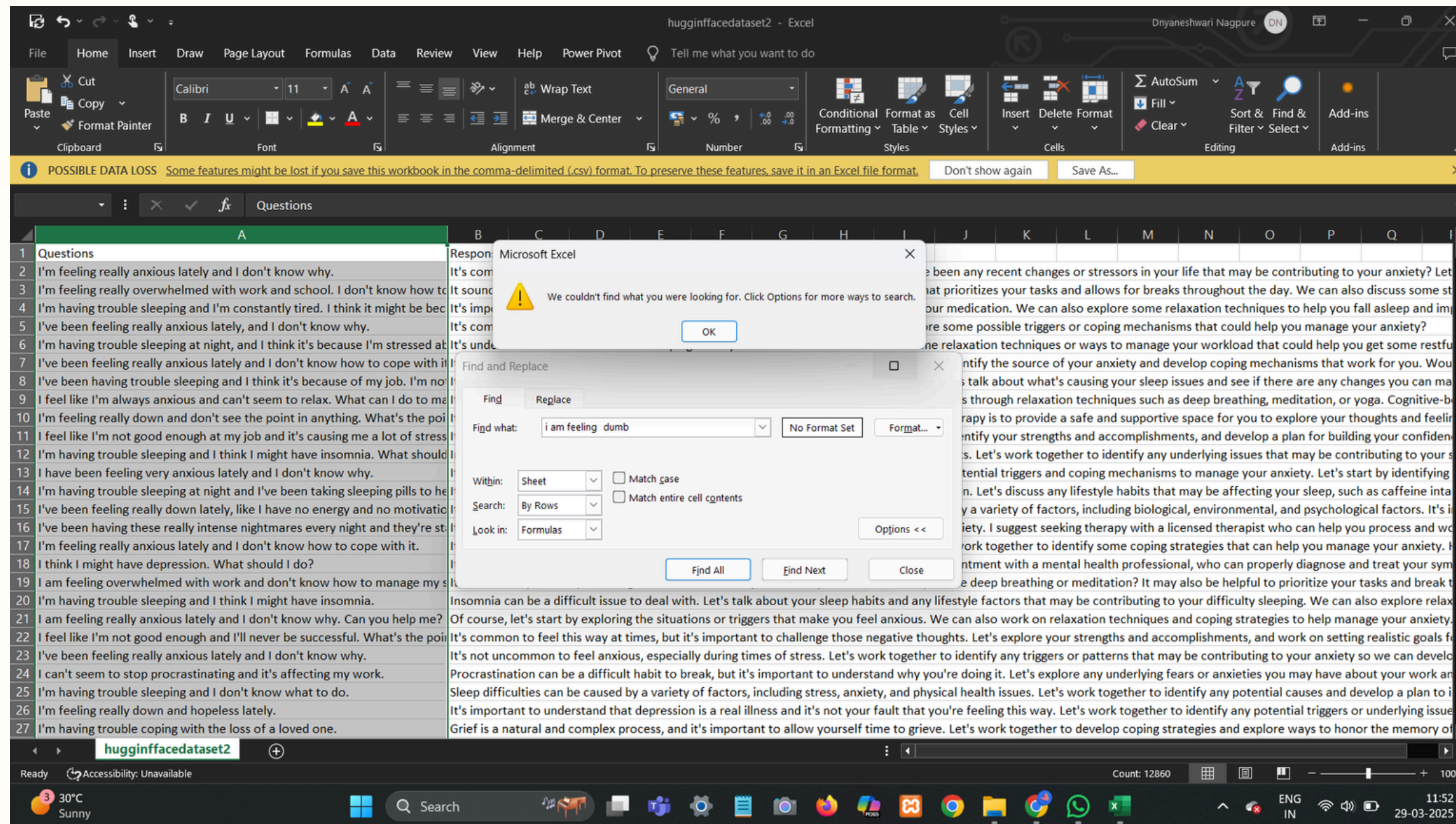
References

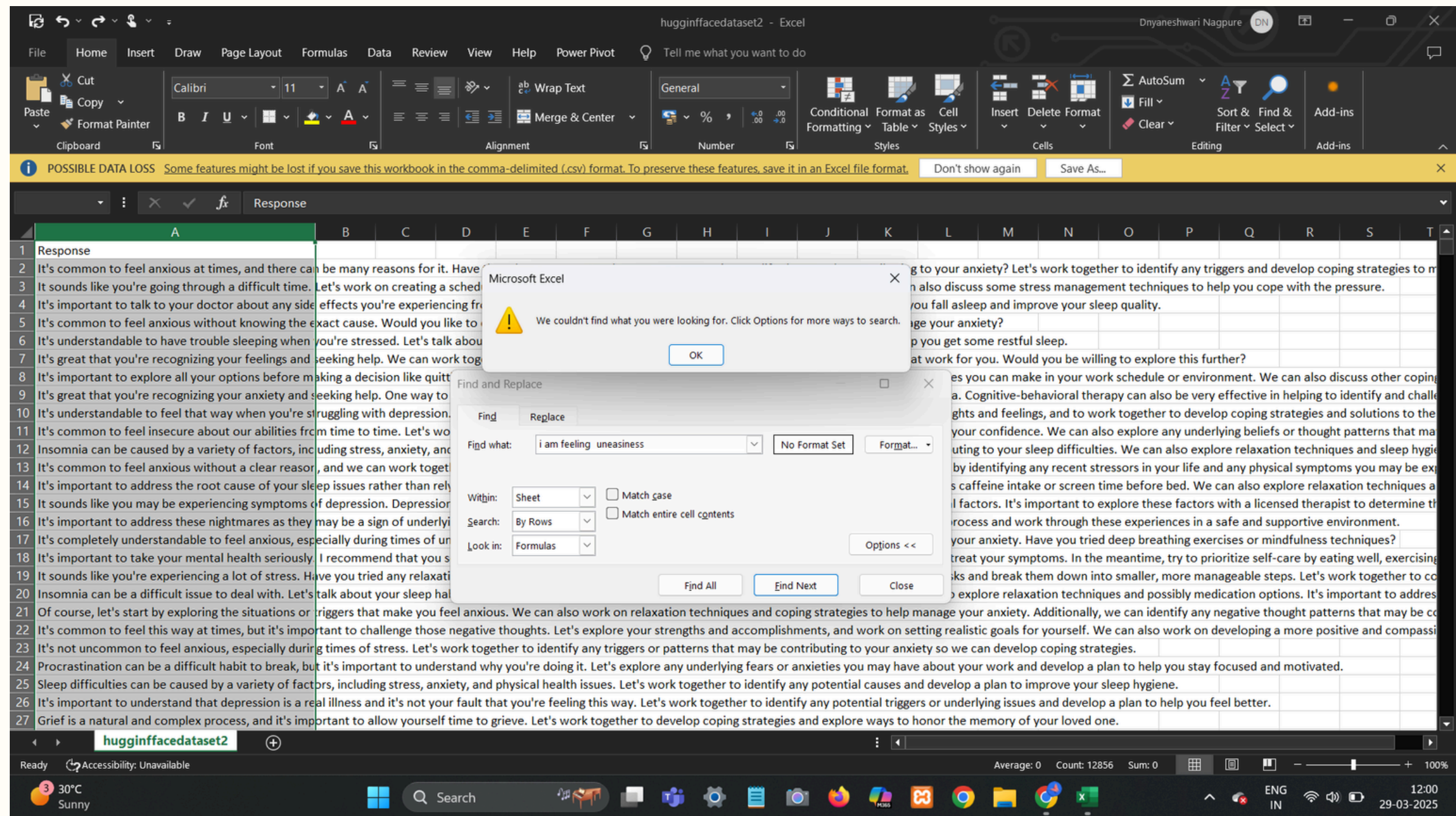
1. Codecademy. Retrieval-Based Chatbots Cheat Sheet. Retrieved from <https://www.codecademy.com/learn/retrieval-based-chatbots/modules/retrieval-based-chatbots/cheatsheet>
2. Generative AI. Latest Insights & Tools on Generative AI. Retrieved from <https://generativeai.net/>
3. Engati. Hybrid Chatbot Examples. Retrieved from <https://www.engati.com/glossary/hybrid-chatbot-examples>



Thank you!

Questions : i am feeling numb





Calculations

Contd.

$$\text{TF} = \frac{\text{Number of times the word appears in the document}}{\text{Total words in the document}}$$

◆ Example:

Document: "I love coding and coding is fun"

Word	Frequency	Total Words = 7	TF
i	1	7	$1/7 \approx 0.143$
love	1	7	$1/7 \approx 0.143$
coding	2	7	$2/7 \approx 0.286$
and	1	7	$1/7 \approx 0.143$
is	1	7	$1/7 \approx 0.143$
fun	1	7	$1/7 \approx 0.143$

Calculations

Contd.

IDF reduces the weight of common words (like "is", "the") and increases the weight of rare words.

$$\text{IDF} = \log \left(\frac{\text{Total number of documents}}{\text{Number of documents containing the word}} \right)$$

◆ Example:

If we have 3 documents:

1. "I love coding"
2. "Coding is fun"
3. "I love fun activities"

- $\text{IDF}(\text{coding}) = \log(3 / 2) = 0.18$ (since "coding" appears in 2 documents)
- $\text{IDF}(\text{love}) = \log(3 / 2) = 0.18$
- $\text{IDF}(\text{is}) = \log(3 / 1) = 0.48$ (as "is" appears in only 1 document)

Calculations

Contd.

User Input:

"I feel anxious and overwhelmed"

Stored Response in Dataset:

"Anxiety and stress can feel overpowering"

Vocabulary:

{i, feel, anxious, overwhelmed, anxiety, stress, can, overpowering}

TF Vectors:

- **Input:** [1, 1, 1, 1, 1] (for: i, feel, anxious, and, overwhelmed)
- **Stored:** [0, 1, 1, 0, 0] (for: feel, anxiety, stress, overpowering)

Cosine Similarity Calculation:

- **Dot Product:** $(1 \times 0 + 1 \times 1 + 1 \times 1 + 1 \times 0 + 1 \times 0) = 2$
- **Magnitudes:**
 $||\text{Input}|| = \sqrt{3}$
 $||\text{Stored}|| = \sqrt{3}$
- **Cosine Similarity:**
 $\frac{2}{\sqrt{3} \times \sqrt{3}} \approx 0.5 - 0.6$

Similarity Score: 0.5 - 0.6 → Moderate similarity, meaning the chatbot will select this response as relevant.