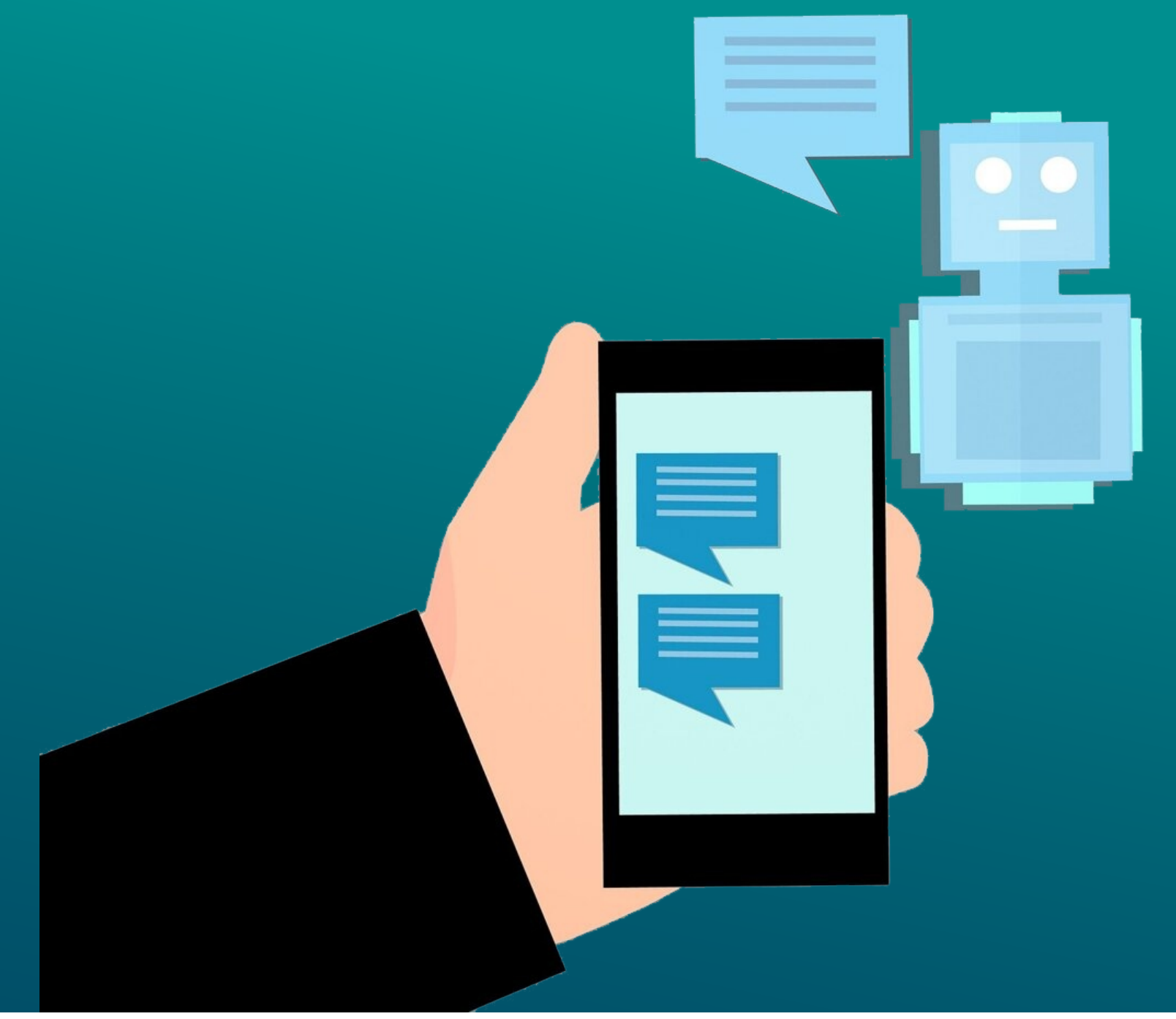# Enhancing mental health support through personalised treatment using a sequential model–based chatbot

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Introduction

Maintaining a state of "mental health," which includes emotional, psychological, and social well-being, is crucial to leading a happy and successful life. Despite this progress, many people still struggle to receive the timely, individualised care they require for mental health issues. Social stigma, a lack of finances, and geographical isolation all contribute to the fact that many people do not receive the medical attention they require.The development of a chatbot to help with mental health problems represents a significant new development in this area. A chatbot is an AI-powered chat-simulating computer programme that employs natural language processing to "chat" with users. This technology can be used by a chatbot dedicated to mental health to make it easier for people to get the assistance they need when they need it.

The dataset contains mental health questions, answers with questionid.

Aims & Objectives

A mental health chatbot individualised therapy system is the focus of this research. The purpose of this system is to provide those looking for mental health support with easy access to tailored advice and help. Using NLP and machine learning methods, the chatbot will be programmed to understand users' questions and provide helpful responses.

Objectives:

- Create a chatbot that can correctly interpret user questions about mental health.
- Integrate NLP methods into the chatbot so it can understand and respond appropriately to user input.
- Use machine learning methods to make the chatbot more adept at giving specific advice and answering specific questions.
- Create an easy-to-use and engaging interface for the chatbot to guarantee a positive user experience.
- Use user feedback and satisfaction surveys to gauge the chatbot system's success.
- Maintain a steady stream of enhancements and updates to the chatbot platform in response to user input and developments in the fields of natural language processing and machine learning.

Methodology

1. Collected data on mental health in its whole, including frequent asked questions about mental health, answers.
2. Utilize the Natural Language Toolkit (NLTK) to preprocess the text data, including tasks such as tokenization, stemming, and removing stop words.
3. I created the model using a Sequential model with some input layers with accuracy of 75%.
4. Deployed the model using flask as a Web application for personalised treatment for users to get advice and support on theirmentalhealth.
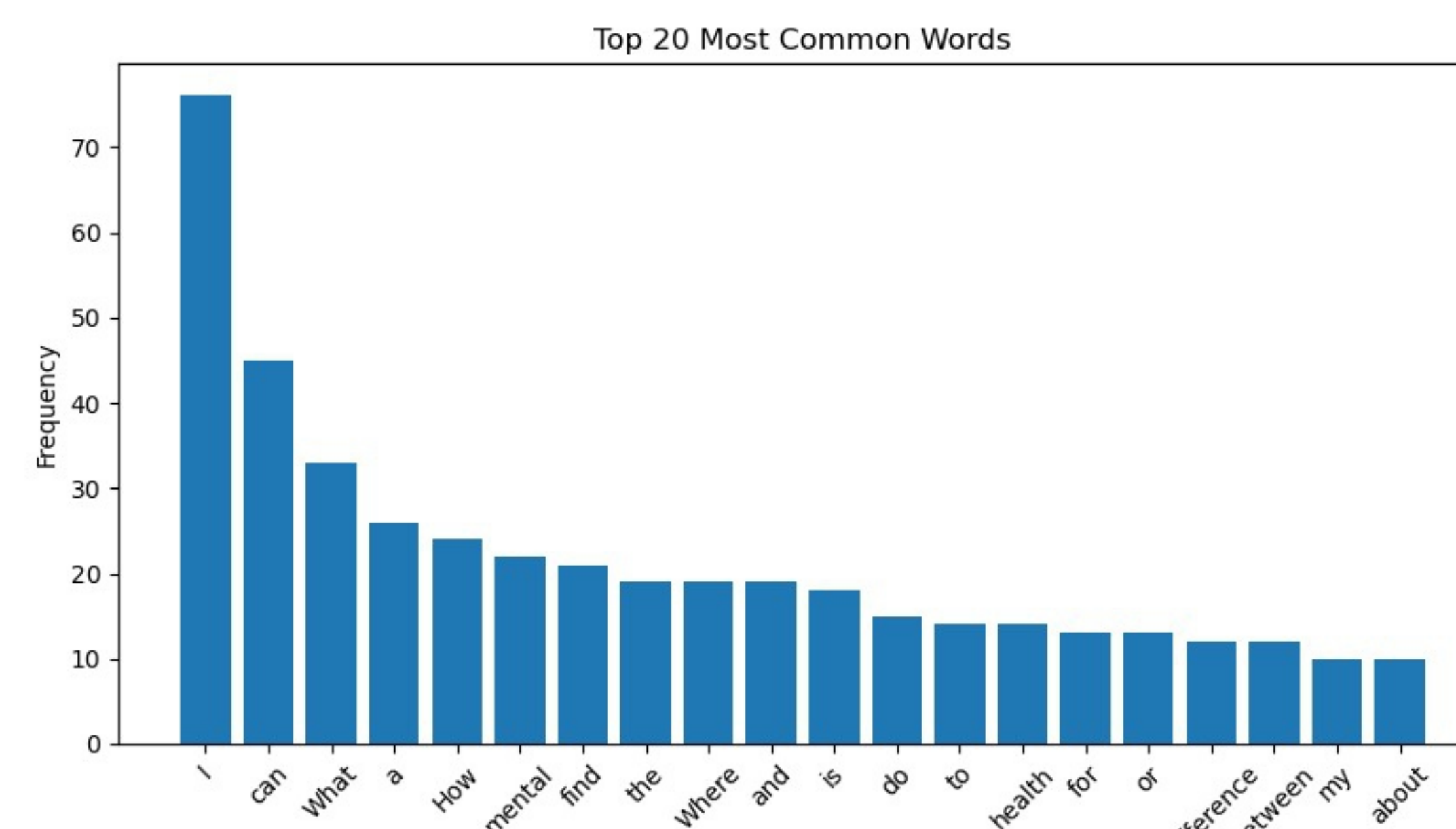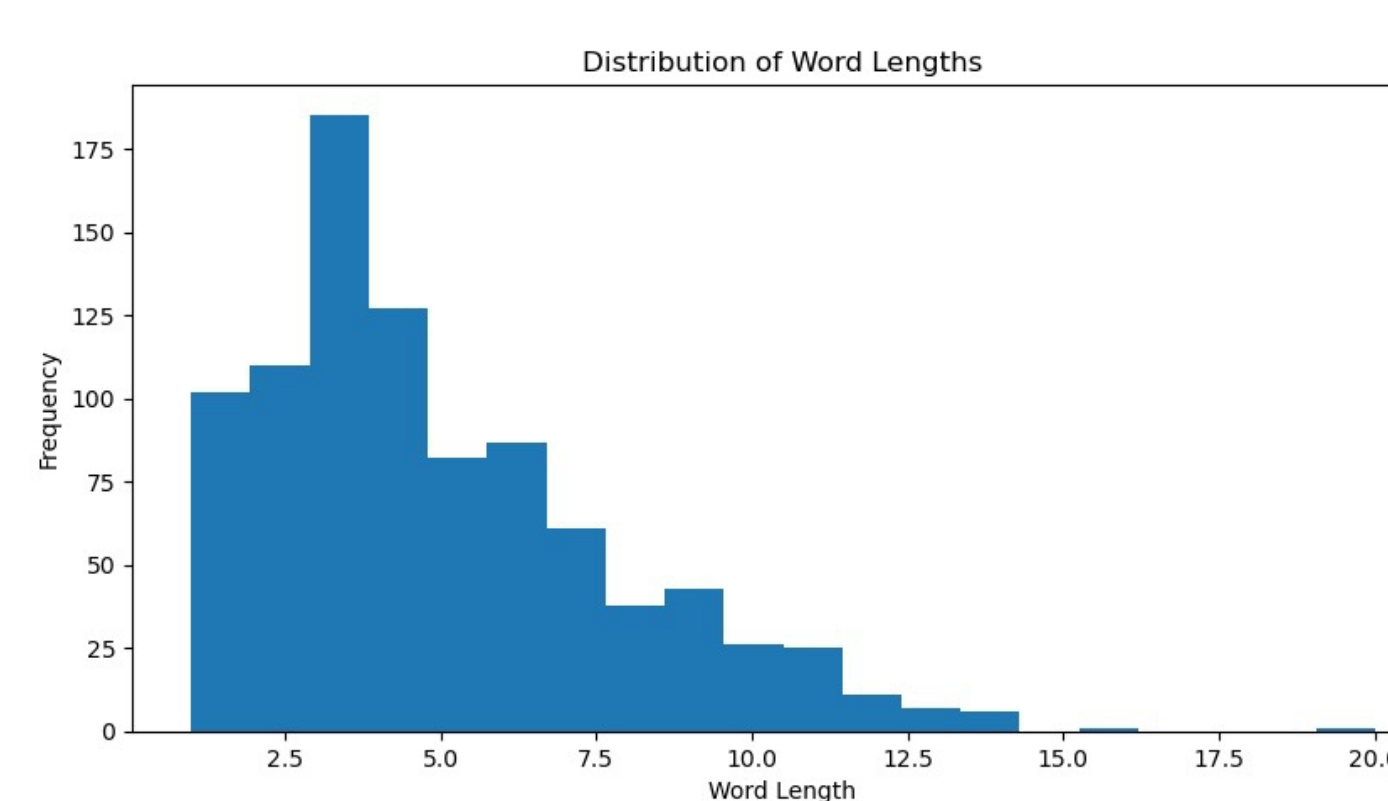

Figure 1: Top 20 most common used words in the dataset

Figure 2: The length of words in the mental dataset

Figure 3: The wordcloud of the most frequent words in thedataset

Preliminary Results

75%

The preliminary results indicate an accuracy of 75% for the Sequential model. This suggests its potential in providing effective personalized therapy and support for mental health concerns.

Future Results

Further analysis and evaluation will be conducted to assess the model's performance on different datasets and user interactions. The aim is to refine and improve the model's accuracy and effectiveness in providing personalized mental health recommendations.

Literature Review

Podrazhansky et.al April 2020. A chatbot-based mobile application to predict and early-prevent human mental illness

The study titled "A chatbot-based mobile application to predict and early-prevent human mental illness" focuses on the development of a mobile application that utilizes a chatbot to predict and prevent mental illness in individuals.

The researchers developed a mobile application that integrates a chatbot capable of engaging in conversations with users. The chatbot utilizes natural language processing and machine learning techniques to analyze user inputs and predict the likelihood of mental illness. The goal of the application is to provide early intervention and preventive measures for mental health conditions.

Kamita, T. et.al (2019) A chatbot system for mental healthcare based on SAT counseling method focuses on the development and evaluation of a chatbot system designed to provide mental healthcare based on the SAT (Systematic Analysis of Thinking) counseling method.

The researchers developed a chatbot system that uses natural language processing techniques to engage in conversational interactions with users. The chatbot system incorporates the SAT counseling method, which is a cognitive-behavioral approach aimed at helping individuals identify and challenge negative thoughts and cognitive distortions.

GitHub Profile

https://github.com/israelkingz/mental_health_deploy_chatbot

References

- Podrazhansky, A., Zhang, H., Han, M. and He, S., April,2020. A chatbot-based mobile application to predict and early-prevent human mental illness. In Proceedings of the 2020 ACM Southeast Conference (pp. 311-312).
- Kamita, T., Ito, T., Matsumoto, A., Munakata, T., and Inoue, T. (2019) A chatbot system for mental healthcare based on SAT counseling method.