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**Department of Computer Science and Engineering**

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Project Phase-II (20CS801) Report

on

## PSYCHE GUIDE:AN EMOTIONAL SUPPORT AI

**NMAM INSTITUTE OF TECHNOLOGY, NITTE**

(An Autonomous Institution under VTU, Belagavi)

*In partial fulfillment of the requirements for the award of the*

Degree of Bachelor of Engineering

in

Computer Science and Engineering

#### by

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CERTIFICATE

Certified that the project work entitled **PSYCHE GUIDE:AN EMOTIONAL SUPPORT AI** is a bonafide work carried out by mohammed ayan syed (4nm20cs106),Mohammed Raseem Suleman (4NM20CS107) , johan vijay braggas(4nm20cs081) and D J Prajwal(4nm20cs058) in partial fulfillment for the award of Degree of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belagavi during the year 2023-24.It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project Phase- 2 (20CS801) prescribed for the said Degree.

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# Introduction:

There are many young people who experience mental health and well being challenges. A potential negative mental health trigger for some youth is a struggle to cope with stress at school or college, feelings of depression and anxiety and availability of adequate help for these stressors is a major problem.Depression can make people feel helpless and without hope, causing them to reach the unfortunate conclusion that suicide is the only way to end their misery.

Using the traditional individual therapy sessions deemed as the gold standard to treatment becomes challenging to implement due to the shortage of mental health workers. The additional challenge is those that require the help will not seek it due to the stigma attached to being diagnosed with mental health disorders which can give them the feeling of being exposed by seeking help from professionals. Chatbots can provide valuable support to patients in assessing and guiding management of various health problems particularly when human resources are scarce. Chatbots can be affordable and efficient on-demand virtual assistants for mental health conditions, including anxiety and depression. Mental health chatbots could benefit in helping patients by providing valuable support and solutions to them, particularly when resources are scarce. These Real-time personal virtual assistance fills in this gap*.* Their role in mental health care is expected to increase.

# Abstract:

Using the traditional individual therapy sessions deemed as the gold standard to treatment becomes challenging to implement due to the shortage of mental health workers. The additional challenge is those that require the help will not seek it due to the stigma attached to being diagnosed with mental health disorders which can give them the feeling of being exposed by seeking help from professionals. Chatbots can provide valuable support to patients in assessing and guiding management of various health problems particularly when human resources are scarce. Chatbots can be affordable and efficient on-demand virtual assistants for mental health conditions, including anxiety and depression. Mental health chatbots could benefit in helping patients by providing valuable support and solutions to them, particularly when resources are scarce. These Real-time personal virtual assistance fills in this gap*.* Their role in mental health care is expected to increase.

**Objective:**

The primary objectives is to be able to build a fully functional question and answering chatbot. We will use NLP to build a mental health chatbot that acts based off of advice and responses by verified psychologists all across the world.

* • Primary objective is to build a fully functional mental health support chatbot
* • Actively listen to the user and provide emotional support
* • Symptom Assessment and Guidance
* • Continuous Learning and Improvement
* • Deliver Psychoeducation and Information
* • Facilitate positive Behaviour change

# System requirement and system design:

# Hardware Requirements:

* **RAM :** Minimum 4GB (8GB recommended)
* **Processor :** Intel i3 or above
* **HDD :** 20 GB Disk space

Software Requirements:

* **VS Code:**Visual Studio Code, also commonly referred to as VS Code, is a source-code editor developed by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.
* **Natural Language Processing with Python** :NLTK is a leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces to over 50 corpora and lexical resources such as WordNet, along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning, wrappers for industrial-strength NLP libraries, and an active discussion forum.
* **Pytorch:**PyTorch is a machine learning framework based on the Torch library, used for applications such as computer vision and natural language processing, originally developed by Meta AI and now part of the Linux Foundation umbrella. It is [free and open-source software](https://en.wikipedia.org/wiki/Free_and_open-source_software" \o "Free and open-source software) released under the [modified BSD license](https://en.wikipedia.org/wiki/Modified_BSD_license" \o "Modified BSD license). Although the [Python](https://en.wikipedia.org/wiki/Python_(programming_language)" \o "Python (programming language)) interface is more polished and the primary focus of development, PyTorch also has a [C++](https://en.wikipedia.org/wiki/C++" \o "C++) interface.A number of pieces of [deep learning](https://en.wikipedia.org/wiki/Deep_learning" \o "Deep learning) software are built on top of PyTorch.

We have to convert the pattern strings to numbers that the network can understand. For this we convert each sentence to a so-called bag of words (bow). To do this we need to collect training words, i.e. all the words that our bot can have a look at in the training data. Based on all these words, we can then calculate the bag of word for each new sentence. A bag of words has the same size as the all words array, and each position contains a 1 if the word is available in the incoming sentence, or 0 otherwise.

Stemming is the process of finding the base word. Let’s take an example, the base word for words runnable, running is run. This is very important because in bag of word model the words appeared more frequently are used as the features for the classifier, therefore we have to remove such variations of the same word.

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For this we use the NLTK module. NLTK (Natural Language Toolkit) is a leading platform for building Python programs to work with human language data. It provides a lot of helpful methods that we can use. One of the methods is Feed Forward Neural Net.

A feed forward neural network is a type of NLP often used for multi-layered network

Of neurons. During data flow, input nodes receives data, which travel through hidden

Layer, and exit output nodes.the bag of word is taken as input and the number of patterns as input size and the number of classes as output size.

# 

# 46205Screenshot (59)

The loss function of a neural network is used to determine if an adjustment needs to be made in the learning process.

Neurons in the output layer are equal to the number of classes. Showing the differences between predicted and actual probability distributions. Above is the cross-entropy loss for binary classification.

* ****Cross-Entropy = 0.00****: Perfect probabilities.
* ****Cross-Entropy < 0.02****: Great probabilities.
* ****Cross-Entropy < 0.05****: On the right track.
* ****Cross-Entropy < 0.20****: Fine.
* ****Cross-Entropy > 0.30****: Not great.
* ****Cross-Entropy > 1.00****: Terrible.
* ****Cross-Entropy > 2.00**** Something is broken.

# References:

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