Advanced Healthcare Chat Bot using Python

A Project Work

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specialization in Internet of Things

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Annexure-2

DECLARATION

I**, 'RAGHU RAM VADLAMUDI**, **RANJITH BANJERJEE**, **DHARMA ARTHI REDDY**, **HARSHA RAJ ',** student of **'Bachelor of Engineering in Computer Science and Engineering specialization in Internet of Things', session: Minor Project-3 6th Semester ,** Department of Computer Science and Engineering, Apex Institute of Technology, Chandigarh University, Punjab, hereby declare that the work presented in this Project Work entitled '**Advanced Healthcare Chat Bot using Python**' is the outcome of our own bona fide work and is correct to the best of our knowledge and this work has been undertaken taking care of Engineering Ethics. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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Abstract

In today's world, health care has become a very important part of our existence. However, it has become very difficult to get a consultation with a doctor about every health related issue. The idea of this project is to develop an artificial intelligence-based medical chatbot to assist To start a good life healthcare is very important. But it is very difficult to the consult the doctor if any health issues. The proposed idea is to create a healthcare chatbot using Natural Language Processing technique it is the part of Artificial Intelligence that can diagnose the disease and provide basic. To reduce the healthcare costs and improve accessibility to medical knowledge the Healthcare chatbot is built. Some chatbots acts as a medical reference books, which helps the patient know more about their disease and helps to improve their health. The user can achieve the benefit of a healthcare chatbot only when it can diagnose all kind of disease and provide necessary information. The system provides text or voice assistance, that means user can use his own convenient language, Bot will provides which type of disease based on the user symptoms, and provides doctor and also provides food suggestion that means which type of food you have to take. Thus, people will have an idea about their health and have the right protection.. Chatbots are programs that work on Machine Learning (ML) as well as Artificial Intelligence (AI)Natural Language Processing (NLP) techniques such as NLTK for Python can be applied to analyses speech, and intelligent responses can be found by designing an engine to provide appropriate human like responses. Key Words: Chatbot, Natural Language Processing (NLP), Natural Language Toolkit (NLTK), Machine Learning (ML), Artificial Intelligence (AI) with diagnosis of the problem. Specifically, the project aims to develop a medical chatbot based on artificial intelligence that helps diagnose a health issue and gives an overview of the disease we have and refers us to a doctor for further guidance. As a result of this project, the healthcare cost will be reduced since there are no longer need to see a doctor for minor health problems, and as a result the bot will also perform better since it takes advantage of python to interact with the user, and it stores the data. Using background data, the chatbot can improve itself in order to provide a faster resolution for future questions You can install the chatbot anywhere, such as on a web page or in an app, depending on your needs): Detailed description of the project This portion of report should contain all relevant diagrams, tables, flow charts, software programming , print outs, photographs etc.,

Acknowledgement

We would like to express our gratitude and appreciation to all those who gave us the possibility to complete this report. Special thanks is due to my supervisor Rajat Tiwari Mam whose help, stimulating suggestions and encouragement helped me in all time of fabrication process and in writing this report. we also sincerely thanks for the time spent proofreading and correcting my many mistakes. Many thanks go to the all lecturer and supervisors who have given their full effort in guiding the team in achieving the goal as well as their encouragement to maintain our progress in track. Our profound thanks go to all classmates, especially to our friends for spending their time in helping and giving support whenever I need it in fabricating our project.

1. INTRODUCTION

AI software is used to build chatbots, which simulate conversations (or chats) with users through messaging apps, websites, mobile apps, and phones utilizing natural language.

This application is fundamental since knowledge is stored in advance and as a result, it can learn itself and restore its knowledge via human assistance or web resources. As the system application is in the form of a chatbot, it uses the question-and-answer protocol in order to respond to the users' requests. This system is developed to reduce healthcare costs and time for the users since they are not able to visit a physician or an expert when they need them immediately.

As the user asks questions, the chat bot can analyse them so that it can provide the best possible answer to that question. I also have a method of storing previous user data so that I can take their feedback when they return. For the bot to learn from the old cases so it can improve for future cases, we need feedback(Optional)from the user whether the given previous solution is correct The question is how to make Chatbot system smart enough. There are two ways of doing so:

• Rule-based Chatbots: Here a Chatbot system works on basis of certain rules. However when the input pattern does not match with any predefined rule then this Chatbot system is inefficient to answer the question. Developers use AIML (Artificial Intelligence Markup Language) to write rules for Chatbot System. AIML is XML based language. Composing rules for various situations is a very tedious job and it is di cult to write rules for every possible situation. These rulebased Chatbot systems can deal with straightforward questions but it are crucial to managing complex questions. Most social media Chatbot systems are rule-based.

• Self-learning Chatbots: These Chatbots use machine learning algorithms that enable them to learn things. These bots can be of two types: Using Retrieval Based Models: These bots are trained for a lot of inquiries and their possible answers. For each question, the bot can locate the most important answers from the set of every conceivable answer. Likewise, there is no issue with the language and sentence structure as the appropriate responses are pre-decided and it can’t turn out badly in a sentence structure way. Using Generative Models: Generative models do not reply with the same answer from a set of answers. They take word by word from the inquiry and give appropriate responses. These models should be prepared more exactly because they can handle spelling and grammar errors easily.

Self-learning chatbots are not yet mature. Often, these chatbots provide irrelevant answers to user queries, which can create an irritating experience for business customers. That's why, From now on, companies and industries prefer rule-based chatbot systems. This document focuses on various topics related to the design, development, and implementation of rule-based chatbot systems. The main contributions of this document are the following:

• This paper presents a critical analysis of various existing rules-based chatbot systems.

• The paper discusses the issues of implementing chatbot systems and guides organizations in choosing the appropriate chatbot platform and framework

• The paper presents case studies on the two most popular rules-based chatbot systems, namely Google Dialog flow and IBM Watson. The document compares both frameworks based on several parameters. This document is structured as follows: Section 2 covers the historical development of chatbots. Section 3 describes and compares chatbots implementation platforms and

development frameworks. section 4explains the parameters used to measure the performance of the chatbot system. Details of the design of Google Dialog flow and the IBM Watson Chatbot system and their limitations are discussed in Section 5. Section 6 contains the conclusion of this study and also discusses future expectations. Chatbot-System

II. HISTORY OF CHATBOT SYSTEMS

All illustrations must be numbered. ELIZA was the first chatbot developed by Joseph Weizenbaum in 1966. ELIZA uses simple matching patterns. ELIZA is designed to work like a therapist asking questions. and reply to the user. Kenneth Colby founded PARRY in 1972. PARRY has the same reaction pattern structure as ELIZA but with an expanded control structure. It is used to simulate diseases. This chatbot system also has language understanding features. PARRY has effective variables such as anger, fear, and distrust. ALICE (Artificial Linguistic Internet Computing Entity) was founded in 1995 by Richard Wallace. It was inspired by ELIZA. It is an open source natural language processing chatbot program that interacts with a human by using some pattern matching rules. ALICE resides in XML knowledge base. It coordinates the client's contribution based on a predefined set of responses. Because you have a predefined set of QA reactions, you cannot successfully answer every query. ALICE's bots can respond. Extend your knowledge bases with XML. In this way, an ALICE bot can be a specialist in a specific data space. Google Dialog flow is a chatbot system from Google that was developed in2010. It is based on natural language conversations. These chatbots are able to respond to voice commands. Dialog flow is a Google service that runs on Google's cloud platform. The user can interact with the chatbot system via a voice and text-based interface. Watson is a Q&A framework developed by the exploration group at IBM's Deep Q&A company.

IBM Watson According to Mind bowser's Scouting study for Chatbot Journal, IBM Watson is the most important decision-making phase for bots for 61% of companies. Microsoft Bot Framework Helps user to connect the chatbot to different channels like SMS, email and others. The Microsoft Bot Framework has its own software development kit (SDK). Popular Chatbot Platforms and FrameworksWhile implementing rule based Chatbot systems two key terminologies are Chat-bot development frameworks, and Chatbot platforms. Many times people get confused in these two terminologies. Below table 1 shows differences between the frame-work and platform

III. PERFORMANCE EVALUATION OF CHATBOT SYSTEMS

It is necessary to evaluate and compare the performance of a chatbot system. There are several dimensions that we can use to compare chatbot systems. Various returns are discussed in this section. Measurement parameters suggested by [16], [17] and [18].

According to [16], the following parameters must be taken into account to evaluate the performance of the chatbot system: Variety of tasks of the chatbot, number of channels (Facebook, Skype, Telegram, etc.)-compatible, compatibility with NLP and language, intelligent collection of user data through interaction, available tools for creating chatbots, etc. [17] proposes the following parameters to evaluate the performance of the chatbot system. Total number of users using a chatbot, number of messages exchanged per day, new users recently registered, how many times the chatbot gave a “don't know” response, user rating at the end of the conversation, etc. [18]

The following parameters are listed for performance measurement: system price, service credibility, usability, exit strategy when the chatbot cannot answer, etc. After summarizing the above parameters, we believe that the following parameters are most important when evaluating the performance of a chatbot system: multitasking, multi-channel support, support for NLP (Natural Language Programming), price, ease of use, Language/Applications/Integration, Free to Explore, TextBased Query Support and Flexibility, Language-Based Query Support, Total Users, Engaged Users, Retention Rate, Backtracking Rate, Ease of Use, System Elasticity, and Scalability. Most of these features are supported by Google Dialog flow and the IBM Watson chatbot system. We present a detailed case study of these two chatbot systems in the next section.

Now a days, health care is extremely necessary in our life. Todays people are busy with their works reception, workplace works and additional addicted to web. They are not involved regarding their health .So they avoid to travel in hospitals for little issues.it may become a significant drawback. So, we will offer a thought is to make a health care chatbot system using AI that may identification the illness and supply basic information regarding the illness before consulting a doctor. Which helps the patients apprehend additional regarding their illness and improves their health. User can do the all reasonably illness information. The system application uses question and answer protocol within the style of chatbot to answer user queries. The response to the question is replied supported the user question. The significant keywords are fetched from the sentence and answer to those sentences. If match is discovered or vital answer are given or similar answers are displayed can identification which sort of illness you have got supported user symptoms and additionally offers doctor details of explicit illness. It may cut back their health problems by victimization this application system. The system is developed to scale back the tending price and time of the users because it isn't potential for the users to go to the doctors or consultants once in real time required.

1.2 Software Specification

1.2.1 Python

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.Often, programmers fall in love with Python because of the increased productivity it provides. Since there is no compilation step, the edit-test-debug cycle is incredibly fast. Debugging Python programs is easy: a bug or bad input will never cause a segmentation fault. Instead, when the interpreter discovers an error, it raises an exception. When the program doesn't catch the exception, the interpreter prints a stack trace. A source level debugger allows inspection of local and global variables, evaluation of arbitrary expressions, setting breakpoints, stepping through the code a line at a time, and so on. The debugger is written in Python itself, testifying to Python's introspective power. On the other hand, often the quickest way to debug a program is to add a few print statements to the source: the fast edit-test-debug cycle makes this simple approach very effective.

Comma-separated values (CSV)

A comma-separated values (CSV) file is a delimited text file that uses a comma to separate values. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format. A CSV file typically stores tabular data (numbers and text) in plain text, in which case each line will have the same number of fields. The CSV file format is not fully standardized. Separating fields with commas is the foundation, but commas in the data or embedded line breaks have to be handled specially. Some implementations disallow such content while others surround the field with quotation marks, which yet again creates the need for escaping if quotation marks are present in the data. The term "CSV" also denotes several closely-related delimiter-separated formats that use other field delimiters such as semicolons.[2] These include tab-separated values and space-separated values. A delimiter guaranteed not to be part of the data greatly simplifies parsing. Alternative delimiter-separated files are often given a ".csv" extension despite the use of a non-comma field separator. This loose terminology can cause problems in data exchange. Many applications that accept CSV files have options to select the delimiter character and the quotation character. Semicolons are often used instead of commas in many European locales in order to use the comma as the decimal separator and, possibly, the period as a decimal grouping character.

Main Library used

1.2.2 Pandas

pandas is a software library written for the Python programming language for data manipulation and analysis. In particular, it offers data structures and operations for manipulating numerical tables and time series. It is free software released under the three-clause BSD license.[2] The name is derived from the term "panel data", an econometrics term for data sets that include observations over multiple time periods for the same individuals.[3] Its name is a play on the phrase "Python data analysis" itself.Pandas is mainly used for data analysis and associated manipulation of tabular data in Dataframes. Pandas allows importing data from various file formats such as comma-separated values, JSON, Parquet, SQL database tables or queries, and Microsoft Excel.[8] Pandas allows various data manipulation operations such as merging,[9] reshaping,[10] selecting,[11] as well as data cleaning, and data wrangling features. The development of pandas introduced into Python many comparable features of working with Dataframes that were established in the R programming language. The pandas library is built upon another library NumPy, which is oriented to efficiently working with arrays instead of the features of working on Dataframes.

1.2.3 Numpy

NumPy (pronounced /ˈnʌmpaɪ/ (NUM-py) or sometimes /ˈnʌmpi/[4][5] (NUM-pee)) is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arraysNumPy targets the CPython reference implementation of Python, which is a non-optimizing bytecode interpreter. Mathematical algorithms written for this version of Python often run much slower than compiled equivalents due to the absence of compiler optimization. NumPy addresses the slowness problem partly by providing multidimensional arrays and functions and operators that operate efficiently on arrays; using these requires rewriting some code, mostly inner loops, using NumPy. Using NumPy in Python gives functionality comparable

to MATLAB since they are both interpreted,[21] and they both allow the user to write fast programs as long as most operations work on arrays or matrices instead of scalars. In comparison, MATLAB boasts a large number of additional toolboxes, notably Simulink, whereas NumPy is intrinsically integrated with Python, a more modern and complete programming language. Moreover, complementary Python packages are available; SciPy is a library that adds more MATLAB-like functionality and Matplotlib is a plotting package that provides MATLAB-like plotting functionality. Internally, both MATLAB and NumPy rely on BLAS and LAPACK for efficient linear algebra computations. Python bindings of the widely used computer vision library OpenCV utilize NumPy arrays to store and operate on data. Since images with multiple channels are simply represented as three-dimensional arrays, indexing, slicing or masking with other arrays are very efficient ways to access specific pixels of an image. The NumPy array as universal data structure in OpenCV for images, extracted feature points, filter kernels and many more vastly simplifies the programming workflow and debugging.

1.2.4 Tkinter

Tkinter is the standard GUI library for Python. Python when combined with Tkinter provides a fast and easy way to create GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.

1.2.5 Matplotlib

Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK. There is also a procedural "pylab" interface based on a state machine (like OpenGL), designed to closely resemble that of MATLAB, though its use is discouraged.[3] SciPy makes use of Matplotlib.

1 LITERATURE REVIEW

Chatbot is a great tool for conversation. Here the application is developed to provide quality of answers in a short period of time. It removes the burden from the answer provider by directly delivering the answer to the user using Chatbot is a great tool for conversation. Here the application is developed to provide quality of answers in a short period of time. It removes the burden from the answer provider by directly delivering the answer to the user using an expert system. The project is developed for the user to save the user their time in consulting the doctors or experts for the healthcare solution. Here we developed the application using the N-gram, TF-IDF for extracting the keyword from the user query. Each keyword is weighed down to obtain the proper answer for the query.

The Webinterface is developed for the users, to the input query. The application is improved with the security and effectiveness upgrades by ensuring user protection and characters and retrieving answers consequently for the questions.an expert system. The project is developed for the user to save the user their time in consulting the doctors or experts for the healthcare solution. Here we developed the application using the N-gram, TF-IDF for extracting thekeyword from the user query. Each keyword is weighed down to obtain the proper answer for the query.

The Webinterface is developed for the users, to the input query. The application is improved with the security and effectiveness upgrades by ensuring user protection and characters and retrieving answers consequently for the questions. synchronous written conversations are getting

well-liked as Web-based psychological state interventions. This review is predicated on associate analysis of individual synchronous Web-based chat
technologies. Several of the prevailing systems have live chats through texts and a few limitation like there's no instant response given to the patients they need to attend for consultants acknowledgement for an extended time.
A number of the processes could charge quantity to measure chat or telecom communication. However, the difficulty of those technologies are cost effective in clinical practice remains a thought for future analysis studies. says that the chatbot will act as a virtual doctor and makes possible for the patient to
interact with virtual doctor. Natural language processing and pattern matching algorithm for the development of this chatbot. It is developed using the python Language. Based on the survey given it is found that the no of correct answer given by the chatbot is 80% and incorrect/ambiguous answer given is 20%.From this survey of chatbot and analysis of result suggested that this software can be used for teaching and as a virtual doctor for awareness and primary care. proposed an idea in which the AI can predict the diseases based on the symptoms and give the list of available treatments If a person‘s body is analyzed periodically, it is possible to predict any possible problem even before they start to cause any damage to the body. Some Challenges are research and implementation costs, and government regulations for the successful implementation of personalized medicine, they are not mentioned in the paper.describes the development of a chatbot for medical students, that is based on the open source AIML based Chatterbean.
The AIML based chatbot is customized to convert natural language queries into relevant SQL queries. A total of 97 question samples were collected and then those questions were divided into categories depending on the type of question. According to the number of questions in each category the resultant categories were ranked. Questions were based on quries, where 47% are of posed questions

2.1 Existing System

Many of the existing systems have live chats through texts and some limitation such as there is no instant response given to the patients they have to wait for experts acknowledgement for a long time. Some of the processes may charge amount to live chat or telephony communication. However, the issue of these technologies are cost effective in clinical practice remains a consideration for future research studies. Here the studies are based on to recognize emotions classification using AI methods. The studies train emotions classification models from a lot of labelled data based on RNN, deep learning, convolutional neural network. Linguistic interaction is most important in counselling using NLP and NLG to understand dialogues of users. Here the multi-modal approach is used of emotion-recognition. They have collected corpuses to learn semantic information of words and represent as vector using the word vector, synonym knowledge of lexical are collected. [1] In this paper a voice recognition chat-bot is developed, if the questions are not understood asked to the bot is further processed using the third party expert-system.
The web-bots are created as text-based web-friends, an entertainer for the user. Here they focused on the improved system if the system is not only text-based but also voice-based trained. Here the

voice recognition requires a 2 part process of capturing and analysis of an input signal. Server response recognition data retrieval and information output. The server used here is SOAP based on black box approach. The use of expert system allows unlimited and autonomous intelligence improvements. [2] This chatbot aims to make a conversation between human and machine. Here the system stores the knowledge database to identify the sentence and making a decision to answer the question. The input sentence will get the similarity score of input sentences using bigram. The chatbot knowledge is stored in RDBMS. [3] The chatbot implemented using pattern comparison in which the order of the sentence is recognized and saved response pattern. Here the author describes the implementation of the chatbot Operating system, software, programming language, and database. How results input and output is stored. Here the input is taken using text () function and other punctuation is removed using trim () function and random () function is used to choose a response from the database. The chatbot is used for an entertainment purpose. [4] Here they use n-gram technique for extracting the words from the sentences. Here n-gram is used for comparison and deduction of the input with case data using Moro phonemes and phonemes as the deciding parameter. Probability analysis for the closest match is performed. The final expression is redirected through an expert system. [5]
The chatbot developed here for healthcare purposes for the android application. The user sends the text message or voice message using Google API. Here the user gets only related answer from the chatbot. SVM algorithm is used to classify the dataset. Here the Porter algorithm is used to discard unwanted words like suffixes or prefixes. [6] The different documents served in web, the content is checked by tagging the dataset using n-gram based low dimensional demonstration, TF-IDF matrix that generates S, U, and V and finally multiplying the 3 matrices cosine similarity is calculated. [7] Here the chatbot is created for the customer service that functions as public health service. The application uses N- gram, TF-IDF and cosine similarity. The knowledge base is created for storing the question and answer. The application clearly shows extracted the keyword from the question ad by using unigram, bigram, and trigram which helps in fast answering. [8]

Disadvantages in Existing system

- It takes more time to response to the user question
- Pay some charges to perform live chat

2.2 PROPOSED SYSTEM

In our proposed system the user can chat with the bot regarding the query through voice or text. The system uses an expert system to answer the queries. User can also view the available doctors for that particular disease. This system can be used by the multiple users to get the counselling sessions online. The data of the chatbot stored in the database in the form of pattern-template. Bot will provide analgesics and food suggestions that means which food you have to take based on the disease. In earlier times, though computers could read digital texts, they could not understand natural language or follow up with context to the text. They could not process language in the

correct way it is supposed to be interpreted. Computers were not equipped to handle written text such as perceived scribbles on paper. Creating a natural flow of the conversation by converting text to speech and speech to text was another task the computer could not understand. Due to many failures, the research for these tasks was put to an end. In the early 1990s, new machine learning (ML) capabilities with rule-based parsing, morphology, and semantics created a whole range of possibilities for computers to understand natural language, which introduced NLP. Deep neural networks and representation learning assist in present-day NLP developments. Today, chatbots are slowly becoming the best alternative for customer queries, so companies spend additional resource investment for routine processes: This gives the company's employees to work on something more productive than doing mundane and tedious daily tasks. To find a chatbot that suits a particular company, one must access all the options available in the market.

4.1 **Advantages in proposed system**

- Reducing health care cost
- Save the user time
- Don't go to hospital for even any small problem

5. **SYSTEM ARCHITECTURE**

The below Figure proceeds with the user can start their conversation with the chatbot like user friendly and it will be stored in the database for future reference. The chatbot will clarify the users symptoms with serious of questions and the symptom conformation will be done. The disease will be categorized as minor and major disease. Chatbot will reply whether it's a major or minor disease.

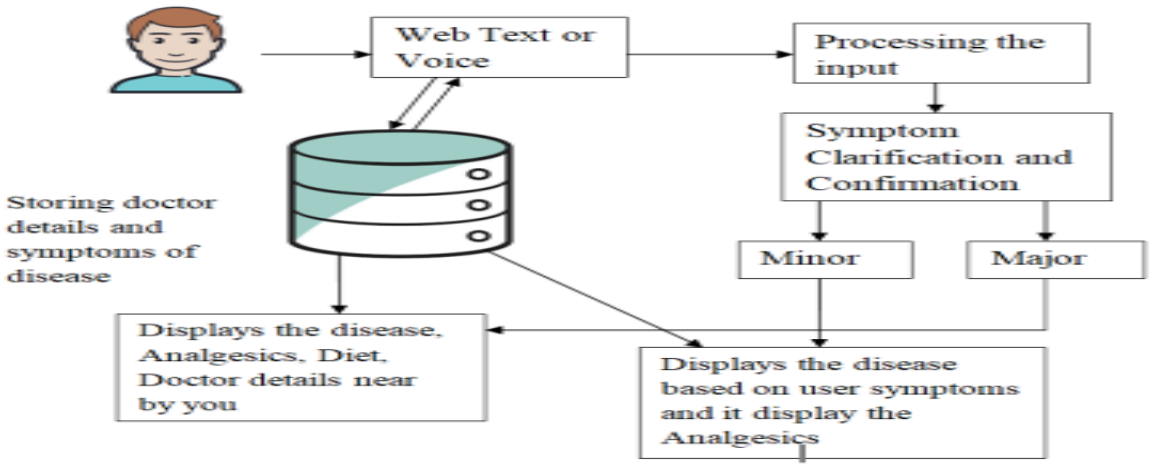

Fig-1

If it's a major one user will be suggested with the doctor details near by you for further treatment and display the analagesics and also provides food suggestions that means which food you have to take more to recover the disease. The chatbot user interface can chat with like user friendly.by using chatbot don't go to hospitals for even small problems.

5.1 **Dataflow Diagram**

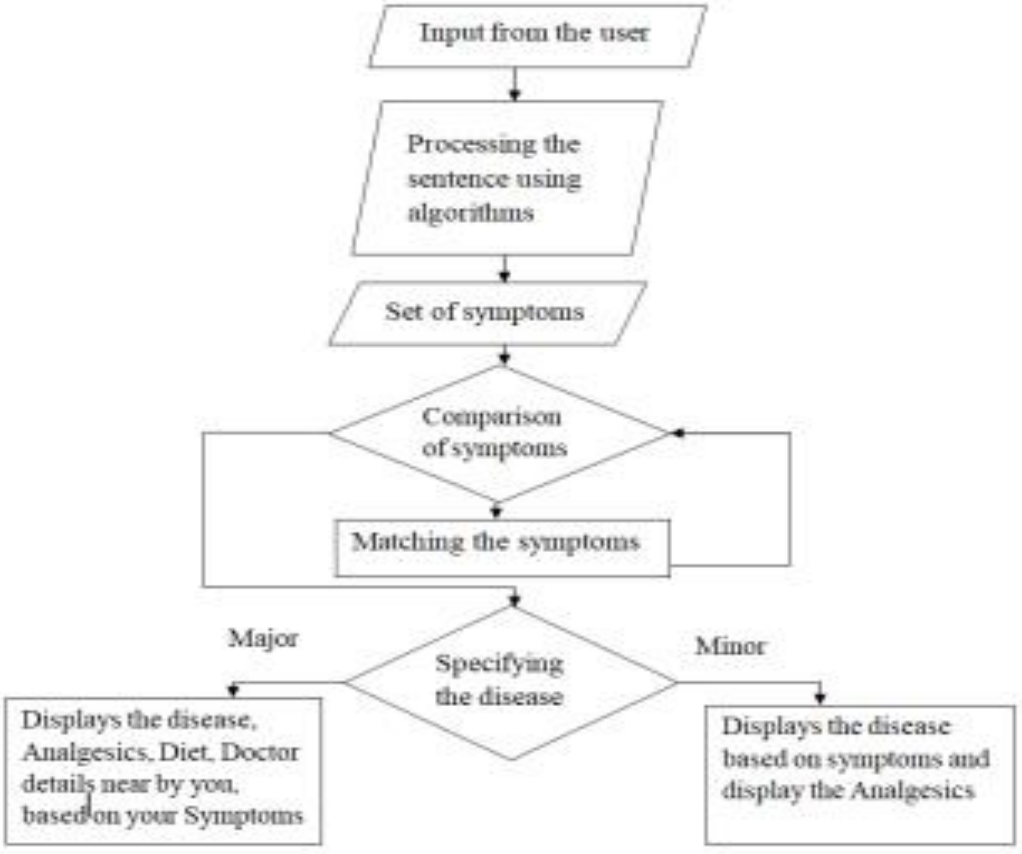

Fig-2:

The chatbot will take the input from the user and then processing the input by using algorithms. Bot will apply the algorithms on whatever the user give the input to the bot.it will understand the input by using algorithms, set of symptoms in the database. The chatbot will clarify the users symptoms with serious of questions and the symptom conformation will be done. The disease will be categorized as minor and major disease. Chatbot will reply whether it‘s a major or minor disease. If it‘s a major one user will be suggested with the doctor details near by you for further treatment and display the analagesics and also provides food suggestions that means which food you have to take more to recover the disease

PROBLEM FORMULATION

Chatbot is an Entity which imitate human discussion in its particular accepted set-up together with a text or vocal language with techniques such as Natural Language Processing (NLP). The aim of this system is to replicate a person’s discussion. The development of chatbot application canbe done with making a user interface to send input and receive response. It is a system that interact with user by keeping the track of the state of interaction and recollecting the preceding commands to give functionality. The medical chat-bots can be developed by using artificial algorithms that scrutinize user's queries and recognize it and give reply to related query. A big disease can start from
small problems such as headache which feels normal but it may beginning of big disease such as brain tumor .most of the disease can be identified by common symptoms so the disease can be

predicted if the patient body is analyzed periodically[6].The system give response by use of an efficient Graphical User Interface such that if actual person is chatting with the user. chatterbot that can be used in various fields like education, healthcare, and route assistance. The central part of the chat-bots includes MySQL.

It is an interactive system solve users query regarding medicine. so they can get correct guidance for treatment through android app by using Google API. The system takes a plain text as input and answering all type of questions output by qualified user is the output . The purpose is to provide a generic solution to this problem. this paper helps in recognizing the reality in texts and giving the past content for developing a conversation which is used in middle-school CSCL scenarios.

A smart chatbot for customer care by using Software as a Service which analyze message of each application server. It help the user to resolve the issue by providing a human way interactions using LUIS and cognitive services which is implemented on AWS public cloud. Admin feeds input to the machine so that machine can identify the sentences and taking a decision itself as a response to a question. The database used in the project is MySQL. The illustration and execution of SQL in the pattern matching operation is required. The conversation can be done so that it can add some knowledge to the database as it has not been modeled before. If in case the input sentences in the database did not match then it will be remodeled. The evaluation of sentence equivalence is completed with bigram that splits the input sentence in to two parts.

The data of chatbot are deposited in the database. The database is appointed as information storage and predictor is used for storing the function and perform pattern matching. This application can be developed by using programming language of Pascal and Java.Paper uses artificial intelligence for predict the diseases based on the symptoms and give the list of available treatments.

It can facilitate us to figure out the problem and to validate the solution.

Author gives chatterbot which is based on AIML (Artificial Intelligent Markup Language) structure for training the model and uses Microsoft voice synthesizer for identification of the word spoken by the user. Natural language processing used for understanding and Microsoft speech recognition is used in speech recognition and speech synthesis for speech to text and text to speech so people get along with it easily

2 RESEARCH OBJECTIVES

The main aim of the project AI Based Healthcare chatbot system using Natural Language Processing, which is easy to use and more secure than the current system it will cure the diseases and helps to maintain proper health in the current system. This system reduces the possibility of diseases.

The information is processed and store in the database,then it is reverted to the user. Also, it provides an accurate information about the heath Symptoms and medicines to the patients. The government will also keep the track of the medicines supplied to the medicals and hospitals. By using diagnosis software,the results are generated accurate and fast. For end users it became easy to gain access in healthcarewebsite and explore different types of services.After using such web-based applications, the results of healthcare were affected in different countries and rate of mortality was steadily decreased. With the help of this natural language processing the proposed system can help the government organizations and hospitals also help in the development of the country.

Thus, we successfully build up a system for hospitals and medical instituteso that user can ask their queries with the medical assistant and book the doctor’sappointment bygiving text messages

Earlier, the artificial intelligence domain was not developed. After the invention of chatbot systems, the problems of users are solved in less time. In the field of healthcare, automated chatbot deployment in web applications is booming all over the world. Patients suffers from different types of diseases and visit to hospital for treatment purpose. Sometimes doctors are not available due to that, time required for nursing takes a lot . To overcome this issue, medical chatbots were developed.

These chatbots are trained and tested on live dataset also accuracy of the output is relevant. The AI based chatbot are fast, reliable and precise. User provide the proper details and receive feedback according to their query. If any user makes minor mistake, the chatbot provides validation and autocorrection features. Nowadays, in every clinics and hospitals portal chatbots are performing multitasking work.

A lot of time of patient is saved and tasks are completed in minimum effort Chatbot is an Entity which imitate human discussion in its particular accepted set-up together with a text or vocal language with techniques such as Natural Language Processing (NLP). The aim of this system is to replicate a person's discussion.

The development of chatbot application canbe done with making a user interface to send input and receive response. It is a system that interact with user by keeping the track of the state of interaction and recollecting the preceding commands to give functionality. The medical chat-bots can be developed by using artificial algorithms that scrutinize user's queries and recognize it and give reply to related query.

A big disease can start from small problems such as headache which feels normal but it may beginning of big disease such as brain tumor .most of the disease can be identified by common symptoms so the disease can be predicted if the patient body is analyzed periodically.The system give response by use of an efficientGraphical User Interface such that if actual person is chatting with the user. chatterbot that can be used in various fields like education, healthcare, and route assistance. The central part of the chat-bots includes MySQL.

It is an interactive system solve users query regarding medicine. so they can get correct guidance for treatment through android app by using Google API.

3 METHODOLOGY

The following methodology will be followed to achieve the objectives defined for proposed research work:

1. Detailed study of health care chatbot will be done.
2. Installation and hand on experience on existing approaches of health care chatbot will be done. Relative pros and cons will be identified.
3. Various parameters will be identified to evaluate the proposed system.
4. Comparison of new implemented approach with exiting approaches will be done.

The healthcare chatbot is designed by using python in backend.

The database files are in CSV format which are trained in the initial stage of the application model

This chatbot uses Natural language processing techniques to process and analyze the data and give the output inappropriate manner. It brings up the disease-related problems about whether the task mentioned above should be assigned to human staff. This healthcare chatbot system will provide

patients healthcare support online at all times. It helps to generate health data and automatically delivers the information of reports to medical management A smart chatbot for customer care by using Software as a Service which analyze message of each application server. It help the user to resolve the issue by providing a human way interactions using LUIS and cognitive services which is implemented on AWS public cloud. Admin feeds input to the machine so that machine can identify the sentences and taking a decision itself as a response to a question. The database used in the project is MySQL. The illustration and execution of SQL in the pattern matching operation is required.

Essential Concepts

Below are some fundamental concepts related to chatbot technology.

Pattern Matching is predicated on representative stimulus-response blocks. A sentence (stimuli) is entered, and output (response) is created consistent with the user input Eliza and ALICE were the first chatbots developed using pattern recognition algorithms. The disadvantage of this approach is that the responses are entirely predictable, repetitive, and lack the human touch. Also, there is no storage of past responses, which can lead to looping conversations

The **Artificial Intelligence Markup Language (AIML)** was created from 1995 to 2000, and it is based on the concepts of Pattern Recognition or Pattern Matching technique. It is applied to natural language modeling for the dialogue between humans and chatbots that follow the stimulus-response approach. It is an XML-based markup language and it is tag-based. As shown in Fig, AIML is based on basic units of dialogue called categories (tag <category>) which are formed by user input patterns (tag <pattern>) and chatbot responses (tag <template>)

```
<aiml version="1.0.1" encoding="UTF-8"?>
   <category>
      <pattern> My name is * and I am * years old </pattern>
      <template> Hello <star/>. I am also <star index="2"/> years old!</template>
   </category>
</aiml>
```

Fig-3

Example of AIML code

Latent Semantic Analysis (LSA) may be used together with AIML for the development of chatbots. It is used to discover likenesses between words as vector representation Template-based questions like greetings and general questions can be answered using AIML while other unanswered questions use LSA to give replies .

Chatscript, being the successor of the AIML language, is an expert system, which consists of an open-source scripting language and the engine that runs it. It is comprised of rules which are associated with topics, finding the best item that matches the user query string and executing a rule in that topic. Chatscript also includes long-term memory in the form of \$ variables which can be used to store specific user information like the name or age of the user. It is also case-sensitive,

widening the possible responses that can be given to the same user input based on the intended emotion, as uppercase is typically used in conversations to indicate emphasis

RiveScript is a plain text, line-based scripting language for the development of chatbots and other conversational entities. It is open-source with available interfaces for Go, Java, JavaScript, Perl, and Python

Natural Language Processing (NLP), an area of artificial intelligence, explores the manipulation of natural language text or speech by computers. Knowledge of the understanding and use of human language is gathered to develop techniques that will make computers understand and manipulate natural expressions to perform desired tasks. Most NLP techniques are based on machine learning.

Natural Language Understanding (NLU) is at the core of any NLP task. It is a technique to implement natural user interfaces such as a chatbot. NLU aims to extract context and meanings from natural language user inputs, which may be unstructured and respond appropriately according to user intention It identifies user intent and extracts domain-specific entities. More specifically, an **intent** represents a mapping between what a user says and what action should be taken by the chatbot. Actions correspond to the steps the chatbot will take when specific intents are triggered by user inputs and may have parameters for specifying detailed information about it Intent detection is typically formulated as sentence classification in which single or multiple intent labels are predicted for each sentence

4 RESULTS AND DISCUSSION

The chatbot consists of the following steps:

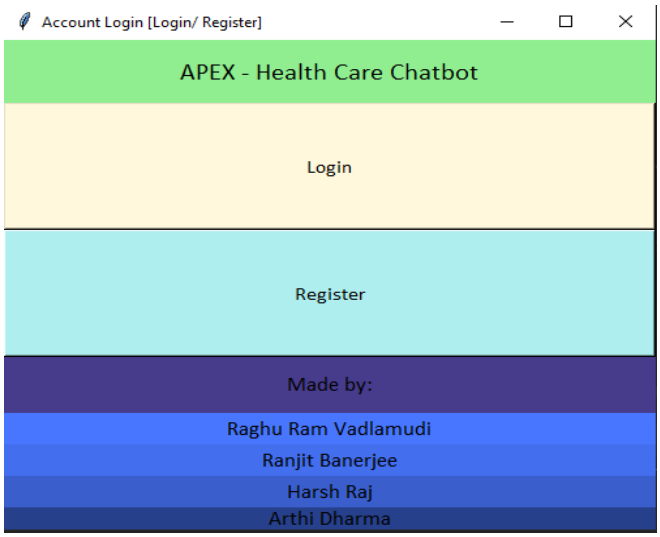

Fig-4

Step 1: This is the main home page where the user needs to register to continue. The registered customer details are stored in the backend, which is used to verify the login details.

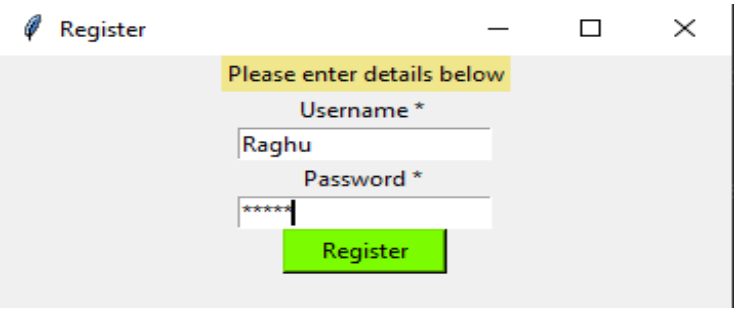

Fig-5

Step 2: In this step, after registering a customer, a dialog box appears with the message "Registration successful" Fig[3] and a button "Click here to continue" that redirects to the main page of the chatbot

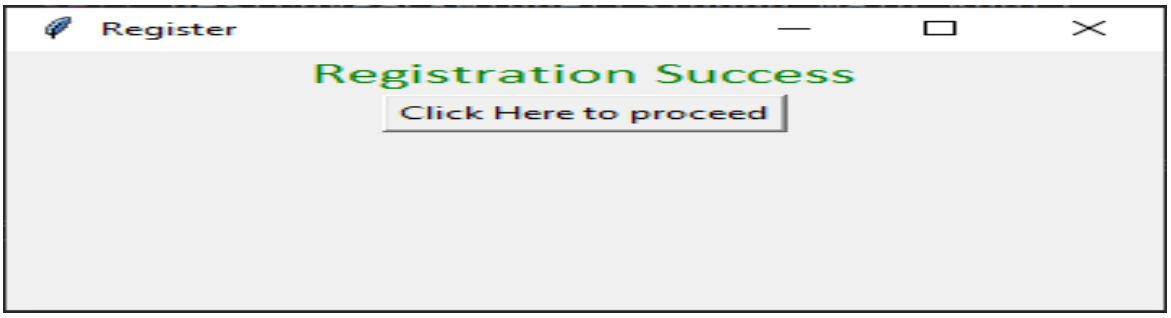

Fig-6

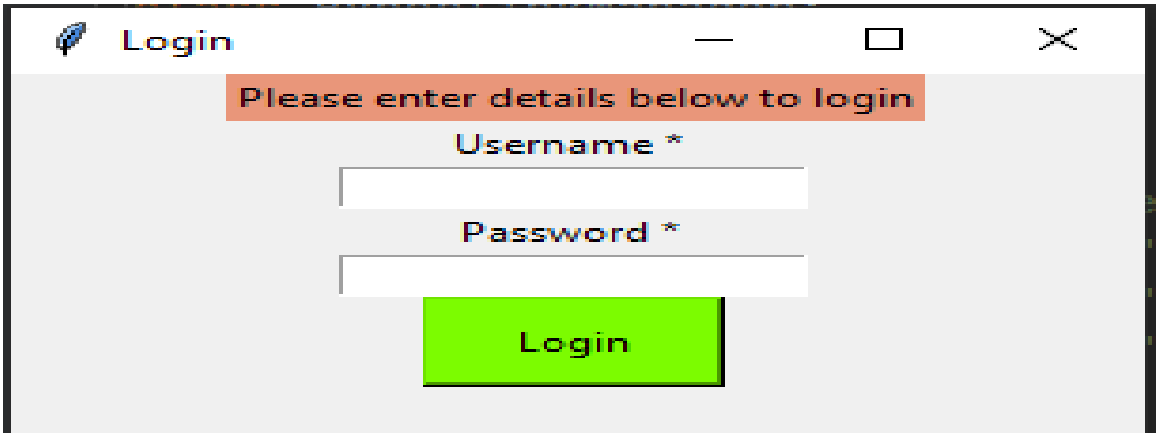

Fig-7

Step 4: In the step we go back to the home page where it is used a second time when a user wants to search again for symptoms of a related disease. On the login page , the customer must enter the registered data so that you can add the customer to the main page of the chat

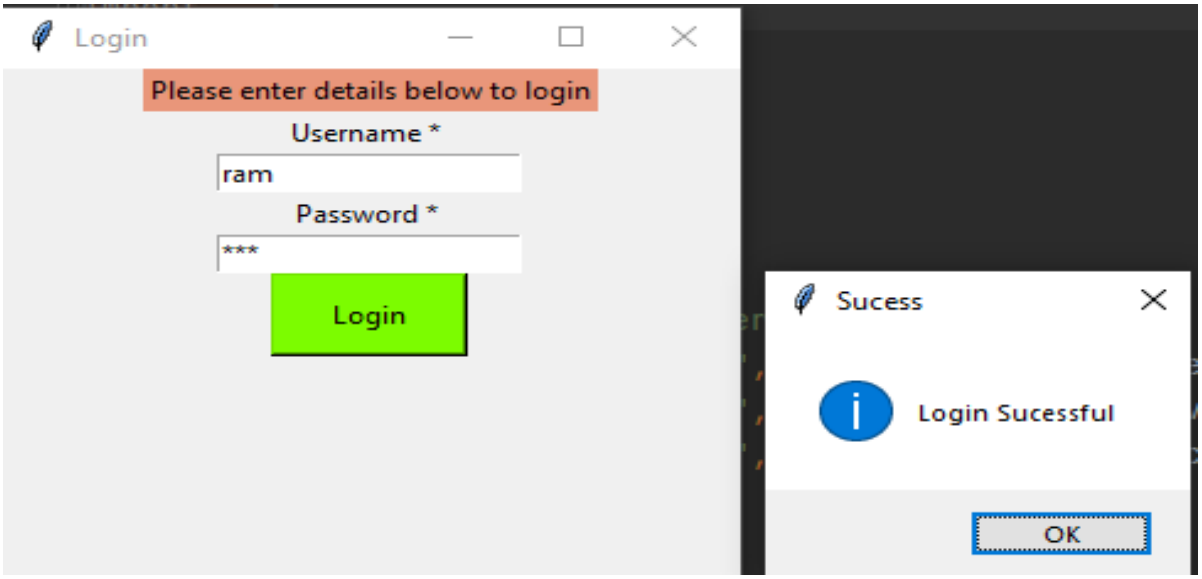

Fig-8

Step 5: In this step, the login page will be redirected to the main page of the chatbot where we will be asked to select the given symptom in a button based on yes or no so that it will act on the entered symptom and give the customer a medical advice link to get

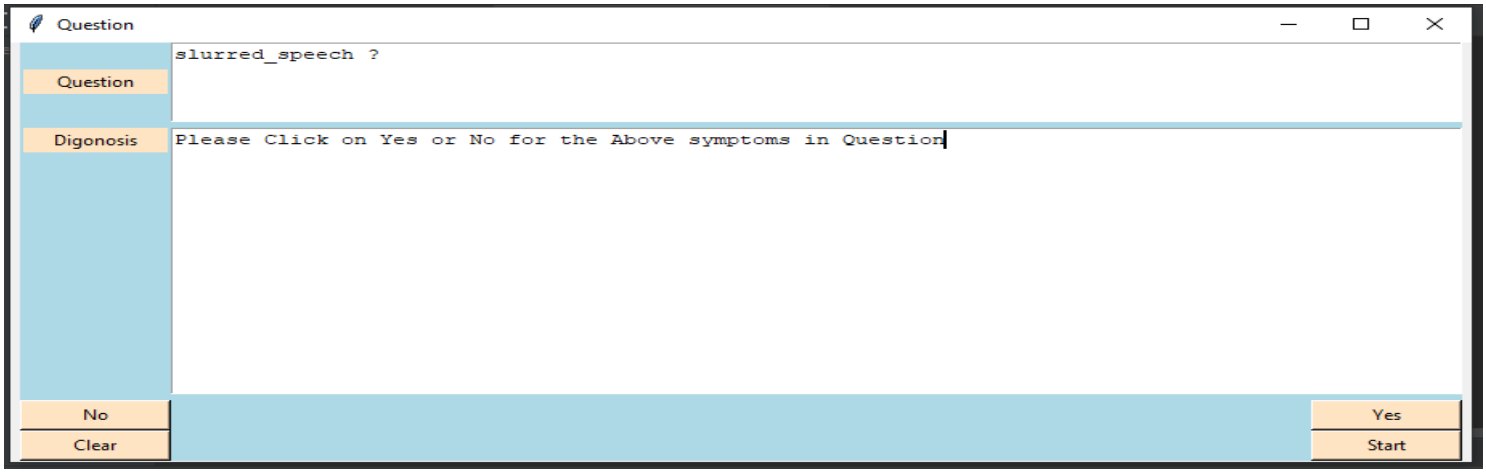

Fig-9

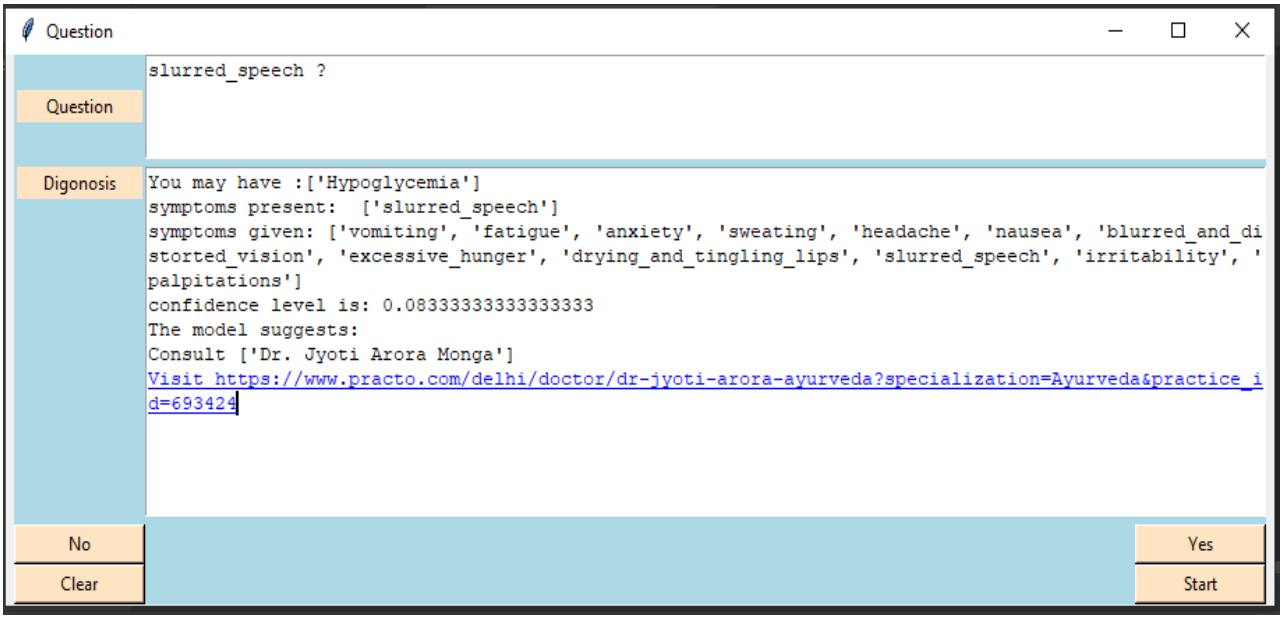
Question
Question
slurred_speech ?
Digonosis
You may have :['Hypoglycemia']
symptoms present: ['slurred_speech']
symptoms given: ['vomiting', 'fatigue', 'anxiety', 'sweating', 'headache', 'nausea', 'blurred_and_di
storted_vision', 'excessive_hunger', 'drying_and_tingling_lips', 'slurred_speech', 'irritability', '
palpitations']
confidence level is: 0.08333333333333333
The model suggests:
Consult ['Dr. Jyoti Arora Monga']
Visit https://www.practo.com/delhi/doctor/dr-jyoti-arora-ayurveda?specialization=Ayurveda&practice_i
d=693424
No
Clear
Yes
Start

Fig-10

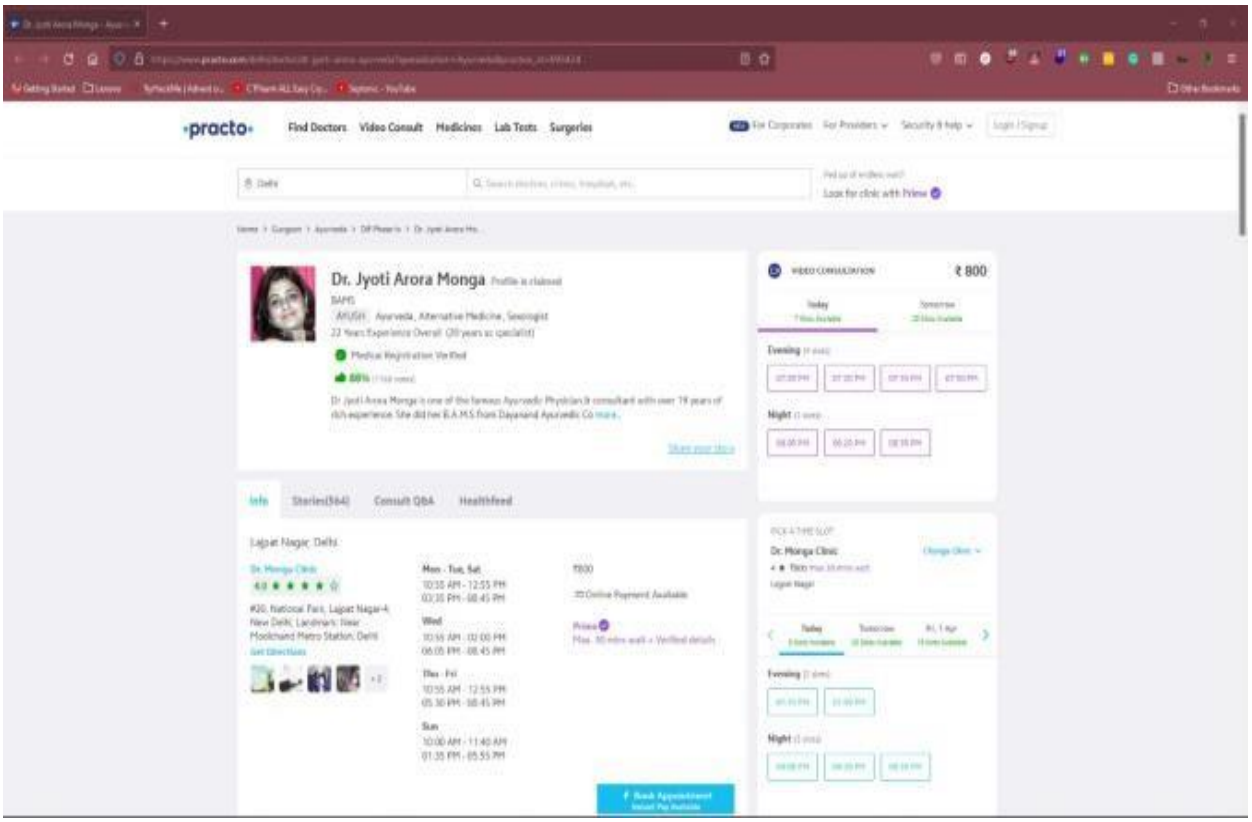
practo
Find Doctors
Video Consult
Medicines
Lab Tests
Surgeries
Dr. Jyoti Arora Monga
₹ 800

Fig-11

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