

KSCST 46TH SERIES: YEAR 2022-2023 STUDENT PROJECT PROPOSAL

SYNOPSIS/WRITE UP

SUBMITTED TO

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

GOVT. OF KARNATAKA

PROJECT PROPOSAL REFERENCE NO. : 46S_MCA_030

PROJECT PROPOSAL TITLE : CLI BASED CHAT TOOL

NAME OF THE COLLEGE : NEW HORIZON COLLEGE OF ENGINEERING

DEPARTMENT : MASTER OF COMPUTER APPLICATIONS

NAME OF THE STUDENTS : 1) MR. ADARSH JAISWAL
Email id: adarshjaiswal374@gmail.com
Contact No.: 7578059780
2) MR. ADARSH KUMAR SINGH
Email id: adarshsinghh462@gmail.com
Contact No.: 9110044219
3) MISS. SUMA N
Email id: leenasuma6@gmail.com
Contact No.: 7349342206
4) MR. SUMAN KUMAR SINGH
Email id: raaz.suman6438@gmail.com
Contact No.: 8340103972

NAME OF THE GUIDE : 1) Dr. V. ASHA
Email id: asha.gurudath@gmail.com
Contact No.: 9448950679
2) MS. NEETHU TRESSA
Email id: neethut.nhce@newhorizonindia.edu
Contact No.: 9633152592

KEYWORDS : CHATBOT, CLI, MULTITHREADING, SOCKET PROGRAMMING

INTRODUCTION

Today, people are heavily using instant messaging applications for personal as well as professional needs. This project focuses on building a command-line chat tool using Python. The tool will support chat rooms and can be used to communicate with multiple users on a network. This project will be useful for anyone who wants to learn and implement socket programming as well as for anyone who wants to understand and build application using client server architecture. Most often than not, we run heavy GUI-based applications for the simplest of tasks. One such simple task is instant messaging or chatting. Chat tools enable users to start chatting with other users in real-time. It also enables users to transmit text messages, images, videos, and hyperlinks. A chatbot is a software or computer program that simulates human conversation or "chatter" through text or voice interactions. Users in both business-to-consumer (B2C) and business-to-business (B2B) environments increasingly use chatbot virtual assistants to handle simple tasks. In the heart of chatbot-CLI, it contains a Parser that parses user's input to command with parameters. And from there, enterprise bot developers can implement different functions.

The parser is having the following features:

- Command is defined by template with parameter placeholders.
 - One command can have multiple templates defined.
 - In a single template, it may have optional/ alternative formats of certain part of the command.
- Multiple commands can be matched for a certain input
 - All these matched commands are rated with rank, and highest rank chose by default, but developer of chatbot can choose alternatives if needed.
 - Bot developer can extend the resolve logic to customize the matching logic.
- Command ranking is resolved by predefined rules together with Reinforcement Machine Learning
 - Selected command and user feedback can be recorded and as factors for resolving command in future.
 - User feedback can be positive and negative, or no feedback.

LITERATURE REVIEW

According to the survey on Chatbot Implementation in Customer Service Industry through Deep Neural Network, the strategies for creating rules for chatbot have been got advanced. Strategy for creating chatbots has depended on hand-written rules and templates. With the rise of deep learning these models were quickly replaced by an end-to-end neural network. More specifically DNN is a powerful generative-based model to take care of the conversational response generation problems. This paper led

an inside and out of the review of ongoing literature, examining more than 70 publications related to chatbots published in the last 5 years. Based on a literature survey this examination made a comparison from chosen papers according to the strategy adopted. This paper also introduced why current chatbot models fail to take into account while generating responses and how this affects the quality of conversation.

According to the research on intent detection based Lithuanian chatbot created via Automatic DNN Hyper-parameter Optimization, they handled a purpose recognition issue for the Lithuanian language with the real supervised data. The main principle of focus is on the upgrade of the NL Understanding module, responsible for the comprehension of user questions. The NLU model is prepared with an appropriately selected word vectorization type and a Deep Neural Network classifier. During their experiment, they have tentatively investigated fastText and BERT embeddings.

According to another research on chatbot technologies and challenges, they gave an outline of the innovations that drive chatbot including Information Extraction and deep learning. they have additionally examined the contrasts between conversational and transactional chatbots. The former is defined manually on free form chat logs while the last is characterized physically to accomplish a particular objective like booking a flight. They have likewise given an outline of commercial tools and platforms that can help in creating and deploying chatbot. At last, they have introduced the limitations and future work difficulties around here.

According to research on Accessible conversational user interfaces consideration for design scope of current guidance and flow direction, reports, exploration and writing on an open plan for various disability groups of incorporating clients with psychological well-being issues, mental imbalance, medical issue, intellectual incapacities, dyslexia, or learning challenges, and tangible, versatility or ability weaknesses. They grouped the component from this assortment of directions that seem applicable to the plan of available CUIs, and cases where direction presents issues that are less decisive, and require further investigation.

According to research on Ensemble-based, deep reinforcement learning for chatbots, trainable chatbots that show familiar and human-like discussions remain a major challenge in artificial intelligence. Deep Reinforcement Learning is promising for tending to this test; however, its fruitful application remains an open inquiry. This article portrays a novel ensemble-based methodology applied to esteem- based DRL chatbots which utilize limited activity sets as a type of importance portrayal. In their methodology, while exchange activities are obtained from sentence clustering, the training datasets in our ensemble are obtained from discourse clustering. They latter plan to induce specific agents that figureout how to communicate in a specific style.

OBJECTIVES

The objective of the project is building a chat tool with a simple command-line interface which supports multiple chat rooms. This project helps in communicating between client and server with the help of multithreading facility and socket programming using Python. This project will be useful for anyone who wants to learn and implement socket programming as well as for anyone who wants to understand and build application using client server architecture. In this project, we aim to build a simple command-line chat tool which is easy to use and also has very minimal interfaces. This tool will be able to send alerts and messages across different platforms with a highly available, low-latency publish/subscribe (pub/sub) services. This tool focus on building and deploying data-driven apps faster using a low-code application development platform and also building AI-powered chatbots and conversational interfaces.

METHODOLOGY

Bots are made for a specific reason. A store would most likely want chatbot services that assists you in placing an order, while a telecom company will want to create a bot that can address customer service questions. In this project, multithreading and socket programming techniques have been used for the development of the Command Line Interface Based Chat Tool.

Multithreading

A thread is a light-weight smallest part of a process that can run concurrently with the other parts (other threads) of the same process. Threads are independent because they all have separate paths of execution. All threads of a process share the common memory. The process of executing multiple threads simultaneously is known as multithreading.

Socket Programming

Sockets allow communication between two different processes on the same or different machines. To be more precise, it's a way to talk to other computers using standard Unix file descriptors. In Unix, every I/O action is done by writing or reading a file descriptor. A file descriptor is just an integer associated with an open file and it can be a network connection, a text file, a terminal, or something else. To a programmer, a socket looks and behaves much like a low-level file descriptor. This is because commands such as `read()` and `write()` work with sockets in the same way they do with files and pipes.

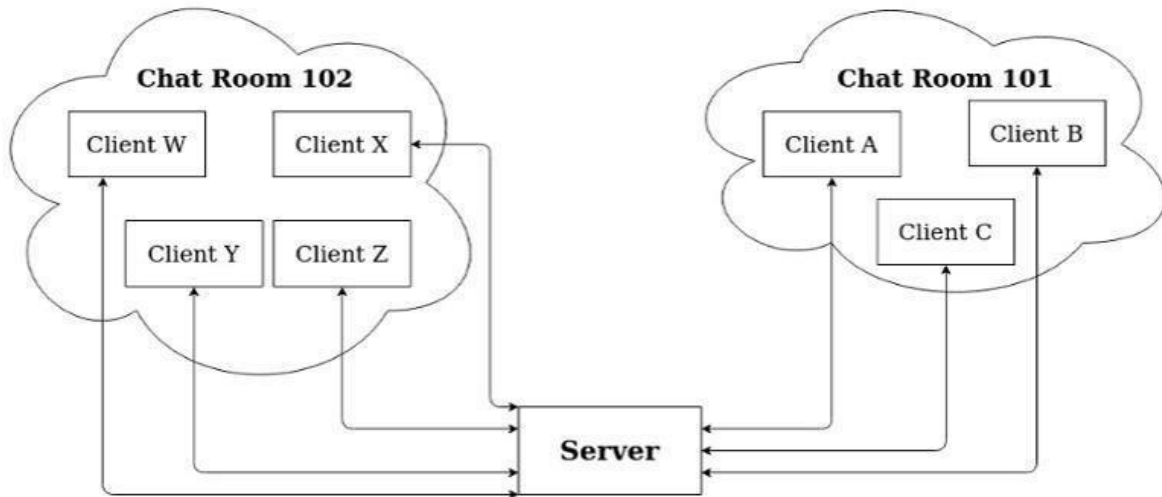
Building a chat application

In this milestone we will be developing a simple chat application by extending the previously built client-server program to allow server to accept connections from multiple clients and also by allowing the server to accept messages from all the clients and broadcasting the messages to all the clients.

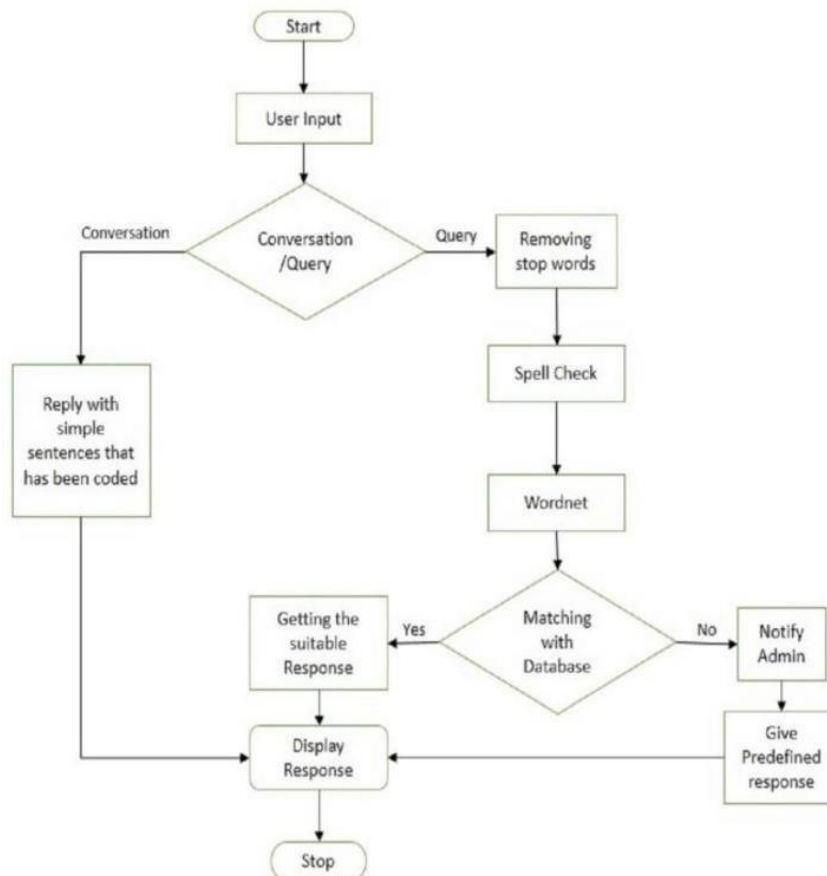
Extending the chat tool

Extend the functionality of the chat tool so that it supports multiple chat rooms. The server should be able to manage multiple users in multiple chat rooms at a given time.

The diagram below shows a high-level approach used to build and develop the chat tool.



The DFD for the project can be given as follows:



RESULTS AND CONCLUSIONS

Smart solutions are important for the success of any business. From providing 24/7 customer service, improving current marketing activities, saving time spent on engaging with users to improve internal processes, chatbots can yield the much-needed competitive advantage. If you are looking to develop a chatbot, the best thing to do is to approach a company that will understand your business needs to develop a chatbot that helps you achieve your business goals. Chatbot technologies will become a vital part of customer engagement strategy going forward. Near to future bots will advance to enhance human capabilities and human agents to be more innovative, in handling strategic activities. Where is the evolution of chatbots headed? Chatbots, like other AI tools, will be used to further enhance human capabilities and free humans to be more creative and innovative, spending more of their time on strategic rather than tactical activities. In the near future, when AI is combined with the development of 5G technology, businesses, employees, and consumers are likely to enjoy enhanced chatbot features such as faster recommendations and predictions, and easy access to high-definition video conferencing from within a conversation. These and other possibilities are in the investigative stages and will evolve quickly as internet connectivity, AI, NLP, and ML advance. Eventually, every person can have a fully functional personal assistant right in their pocket, making our world a more efficient and connected place to live and work. Under this study, an attempt is made to understand the automated process of various chatbots by using smart algorithms. The classification of text in chatbot by using pattern matching to build, train, test it, helps in getting the desired output. It allows spoken or written phrases to be analyzed by computers to determine the intent of the user. Architecture and designing process of the chatbot is studied to understand how they interact with humans. AI chatbots helps better decision making. The advantages, disadvantages and various other applications of a chatbot are mentioned.

INNOVATION IN THE PROJECT

The project has the novelty in terms of multiple chat rooms, and at the same time, because of Command Line Interface, the entire application becomes lightweight also. The server will be capable of handling multiple clients at a time and also able to broadcast the same message to multiple clients.

SCOPE FOR FUTURE WORK

The future of chatbots is still up in the air. Businesses that favor one-on-one or telephone talks are now obsolete as the world of technology expands. Customers are now demanding quicker forms of communication via messenger programs. The only way to improve conversion rates in the market is through conversion rate optimization. Experiences that make the lives of customers and employees more accessible, safer, more enjoyable, and more productive. Now, as you are aware of what a chatbot is and

how important bot technology is for your business. Bots have drastically changed the way businesses interact with their customers. Future works in chatbots can be seen in the following ways:

1. Trying out different neural networks

We used the simplest keras neural network, so there is a lot of room for improvement by trying out convolutional networks or recurrent networks for the project.

2. Using more data

Our json file was extremely tiny in terms of the variety of possible intents and responses. Human language is billions of times more complex than this, so creating JARVIS from scratch will require a lot more.

3. Using different frameworks

There are many more deep learning frameworks than just keras. There's TensorFlow, Apache Spark, PyTorch, Sonnet, and more. The application can be improved by using any such frameworks also.