COLLEGE ENQUIRY PROCESS USING CHAT-BOT SYSTEM

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ABSTRACT:
In the earlier days, students had to visit the college to enquire about details like courses, fee structure, admission process and other information about the college, which is a tiresome and long process. This is where we thought of using an intelligent bot delivering the information. College Enquiry Chabot is a web application which aims to provide the information regarding college asked by the user. We use a special Artificial Neural Network(ANN) to classify users message, categorize the user message and then respond to the user accordingly. We use Flask to implement a web application interface as frontend and we train the model using NLP (Natural Language Processing)-NLTK and also we use deep learning concepts like Tensor flow – Keras and Python with ML concepts like pickle.

1.INTRODUCTION:

This is designed using deep learning machine learning concepts. Machine learning focuses on the use of data and algorithm to imitate the way that human learn Deep learning is a subset of machine learning. In simple, terms it just replicates the human brain as all neural networks are connected in brain which exactly is concept of deep learning. It solves complex problems with the help of algorithms and its process.

A Chat bot is a computer program that communicates with humans. A Chat bot is essentially a computer program that mimics human behaviour. An Artificial neural node inspired by neural nodes of human brain, powers a Chat bot that uses AI and machine learning. Chat bots are computer programs that can readily mimic human discussions. IBM, for example provides a machine learning Chat bot that allows businesses to communicate with their customers through IBM Watson Assistant API. Chat bots overly popular in the year 2016.As a resultof implications 2016 has been called “the year of Chat bots”. Now a days Chat bot has become a new communication tool.

Various businesses[8] are already adopting Chat bots to swiftly and efficiently respond to frequently asked queries from their clients. Chat bots are used in various industries including customer service, healthcare and e-commerce. These Chat bots have gained their attention due to their ease of use and accessibility.

2.RELATED WORK:

A literature survey is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. It should give a theoretical base for the research and help you (the author) determine the nature of your research. Prof. Ram Manoj Sharma [2] proposed a college enquiry Chat bot system which has been built by using Artificial Intelligence algorithms. The bot analyses user’s query and understands user messages. The system has modules like Online Chat bot, Online Noticeboards etc.

[2]. P. Nikhila, G. Jyothi, K. Monika, Mr. C

 DOI: 10.36893.JK.2023.V13I04N16.0061-0065

Kishore Kumar Reddy and Dr. B V Ramana Murthy [3], they have designed using AIML (Artificial Intelligence Markup Language) to make response to queries. AIML is employed to make or customize Alice bot that could be a chat-bot application supported ALICE free code [3]. Harsh Pawar, Pranav Prabhu, Ajay Yadav, Vincent Mendonca, Joyce Lemus [6], a Chat bot is designed by them using knowledge in database. The proposed system has Online Enquiry and Online Chat Bot System. The development is done using various programming languages by creating a user friendly graphical interface to send and receive response. The main purpose is it uses SQL (Structured Query Language) for pattern matching which is been stored in program [6]. Nitesh Thakur, Akshay Hiwrale, Sourabh Selote, AbhijeetShinde and Prof. Namrata Mahakalkar, proposed an artificial Chat bot using NLP (Natural Language Processing) which can be done in two ways the first via written text and the second is via verbal or voice communication. Written communication is much easier than the verbal communication. This paper introduces an interest in some emerging capabilities for evolving speed understanding and processing in virtual human dialogue system [7].

3.PROPOSED METHOD:

In this paper, we aimed at developing an intuitive Chat bot with help of the Flask API and the process flow of the system is shown below. User inquiries are first taken care of by NLTK check, to check whether the entered inquiry is present as a pattern in intents. JSON file or not.
We have developed a web based Chat bot that functions as a virtual college assistant which resolves all the queries of the students about the college. In this paper we will discuss the development of a web based Chat bot using flask API.

3.1. SYSTEM DESIGN:

The process of establishing the architecture, components, modules, interfaces, and/ data for a particular system in order to meet defined requirements is known as system design. A Chat bot[9] is a computer software that uses patterns to replicate human to human communication, particularly over the internet. They are our online assistants who provide a variety of services via internet chat.

WORKING OF A CHATBOT:

1.INPUT:

When a user sends a message to the Chat bot, the input is processed by the bot's natural language processing(NLP) system. This system break downs the message into its constituent parts, analyses the meaning, and identifies the user's intent.

2.INTENT RECOGNITION:

The bot's NLP system recognizes the user's intents by comparing the input message against a pre-built set of training data, which includes various examples of the user input and corresponding intent labels.

3.RESPONSE GENERATION:

Once the bot has identified the user intent, it generates a response based on its pre-programmed set of responses or by accessing external data sources like APIS or databases. The response is designed to address the user's request or inquiry in a natural language that is easy for the user to understand.

4.LEARNING AND IMPROVING:

As users interact with the Chat bot over time, the bot's NLP system[10] continues to learn from these interactions, getting better at recognizing user intents and generating accurate responses. The Chat bot can also be trained further by developers who can provide additional examples of user input and the corresponding intent labels.

3..2. CONCEPTS INVOLVED IN BUILDING-WEBBASED CHATBOT:

NLP:Natural Language Processing (NLP) is a process of manipulating or understanding the text or speech by any software or machine. An analogy is that humans interact and understand each other's views and respond with the appropriate answer. In NLP, this interaction, understanding, and response are made by a computer instead of a human. The area of study that emphasizes interactions between human language and computers is referred to as natural languageprocessing, or NLP for short. It is in the point where information, AI and language are mixed up together. The NLP enables computers to

 DOI: 10.36893.JK.2023.V13I04N16.0061-0065

intelligently and usefully analyse, and interpret human language. Developers collaborate and built knowledge to perform tasks such as automatic synthesis, translation, recognition of named entities, extraction of relationships, analysis of feelings, speaking recognition and segmentation of subjects.
The Natural Language Toolkit (NLTK) is a platform used for building Python programs that work with human language data for applying in statistical natural language processing (NLP). It contains text processing libraries for tokenization, parsing, classification[11], stemming, tagging and semantic reasoning. It also includes graphical demonstrations and sample data sets as well as accompanied by a cook book and a book which explains the principles behind the underlying language processing tasks that NLTK supports.

FLASK API:

Flask is a web framework. This means flask provides you with tools, libraries and technologies that allow you to build a web application. This web application can be some web pages, a blog, a wiki or go as big as a web-based calendar application or a commercial website.
Flask is part of the categories of the micro framework. Micro-framework is normally framework with little to no dependencies to external libraries. This has pros and cons. Pros would be that the framework is light, there are little dependency to update and watch for security bugs, cons is that some time you will have to do more work by yourself or increase yourself the list of dependencies by adding plugins.
Flask is popular web framework for building web applications using the python programming language. It is light weight framework that provides a simple and flexible way to create web applications and APIs. Flask is designed to be easy to use and does not impose any structure or pattern on developer. It allows developers to start building[12] a web application quickly and easily, and give them the flexibility to structure design their application in the way that makes sense for them. Flask includes many features that are common to web frameworks such as support for routing, templates and HTTP response/request handling It also provides extensions for additional functionality such as database integration, authentication and more.

3.3STEPS INVOLVED IN DESIGNING CHATBOT:

a.Import and load the data file:

Make a file name as training.py. Import the necessary packages for our Chat bot and initialize the variables which will be useful in our Python project. The data file is in JSON format so we used the JSON package to parse the JSON file into Python.

b.Pre-process data:

When working with text data, we need to perform various pre-processing on the data before design an ANN model. Tokenizing is the most basic and first thing you can do on text data. Tokenizing is theprocess of breaking the whole text into small parts like words. Here we iteratethrough thepatterns and tokenize the sentence using nltk. word_tokenize () function and append each word in the words list. We also create a list of classes for our tags. Now we will lemmatize each word and remove duplicate words from the list. Lemmatizing is the process of converting a word into its lemma form and then creating a pickle file to store the Python objects which we will use while predicting.

c.Split the data into training and test:

Now, we will create the training data in which we will provide the input and the output. Our input will be the pattern and output will be the class our input pattern belongs to. But the computer doesn't understand text so we will convert text into numbers.

d.Build the ANN model using Keras:

We have our training data ready, now we will build a deep neural network that has 3 layers. We use the Keras sequential API for this. After training the model for 200 epochs, we achieved 100% accuracy on our model. Let us save the model as 'model.h5'.

e.Predict the outcomes:

Static folder contains a subfolder with name styles. The styles folder contains CSS file with the name style.css Templates folder HTML file with the name of index.html app.py for running the flask app using IDE.

f.Deploy the model in the Flask app:

 DOI: 10.36893.JK.2023.V13I04N16.0061-0065

ISSN: 2278-4632
Vol-13, Issue-04, No.06, April : 2023

We will load the trained model and then use a graphical user interface that will predict the response from the bot. The model will only tell us the class it belongs to, so we will implement some functions which will identify the class and then retrieve a random response from the list of responses.

Again we import the necessary packages and load the 'texts.pkl' and 'labels.pkl' pickle files which we have created when we trained our model:

To predict the class, we will need to provide input in the same way as we did while training. So we will create some functions that will perform text pre-processing and then predict the class. After predicting the class, we will get a random response from the list of intents.

An IP address will be generated after running the flask app and when this IP address when entered in a browser opens a web based Chat bot.

4.RESULTS AND DISCUSSIONS:

The Chat bot delivers the generated response back to the user via

The Chat interface. If the user has follow up questions or requests, the Chat bot will repeat the above process to determine the user intents and generate a response.

Figure-1 represents modules built in designing Chat-bot

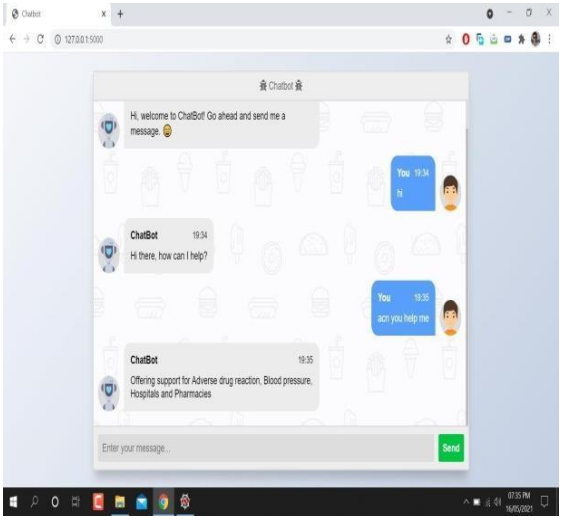

Figure-2 represents the Chat-bot Output

5.CONCLUSION:

In this project, we have introduced a Chat bot that is able to interact with users. This

Chat bot may respond to questions submitted as text. This was accomplished using NLTK and Flask model. The Chat bot can only respond to inquiries for which it has answer in dataset. We have implemented this Chat bot in our college website for ease of use of users to find the required information.

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DOI: 10.36893.JK.2023.V13I04N16.0061-0065

International Journal of Engineering Research & Technology (IJERT) http://www.ijert.org ISSN: 2278-0181 IJERTV9IS090396 (This work is licensed under a Creative Commons Attribution 4.0 International License.) Published by: www.ijert.org Vol. 9 Issue 09, September2020

International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 23219653; IC Value: 45.98; SJ Impact Factor: 7.429 Volume 9 Issue XII Dec 2021- Available at www.ijraset.com

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