Smart Assistant Using Deep Learning and Python

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Abstract: - The present condition among people created because of this pandemic that is prevailing in the world requires social distancing. The pandemic is quite troublesome but the spread can be controlled by following the rules and regulations issued by the government that overall portrays the concept of social distancing. It is important to meet our daily needs amidst this pandemic. Project here will serve as a bridge of communication between the user and the organization. This smart assistant helps user to find the place of products, safely portraying a distant relationship between consumer and seller. This assistant can navigate on several categories of products and provide the place where the product is being kept hence it works more efficiently for certain restricted jobs as it is not intended for direct conversation. The primary aim of project is to create a virtual environment where the consumer can chat and get to know about the location under which they placed. Thus, helping us reduce direct contact with the employee as all the info will be available in our smart assistant.

Key Words: — *Intents, Deep learning, Patterns, Bag of words, SGD, Response.*

I. INTRODUCTION

The idea of our project is to develop a deep learning model that can learn using a training dataset, predict, and respond to the messages sent by the user. In addition, here we create a smart assistant that can provide with the market prices of products available as in pantries, fashion, mobiles, electronics and home and appliances. The main purpose of creating this project is to prevent open conversation anywhere or in any field according to the needs of our smart assistant. This will help a lot in the new normal, as it does not require anyone to monitor and it is user friendly. To build this smart assistant along with a python interface, deep learning model was integrated. Initially, the model was created and trained using a dataset. After creating and testing with the dataset, we created this smart assistant with a bit more complexity and features [1]. There are two ways of creating a smart assistant we have worked with retrieval based smart assistant, the neural network we used is a special variant of RNN.

II. LITERATURE REVIEW

Jacob and Sankar concluded that services of the customer must be timely and heedful. This paper provided a case study of such chatbot techniques and its implementation. It gives an introduction and quick overview of preceding and succeeding methods used to create chatbots. Deep learning methods are provided along with its characteristics and accuracy. [1] where they had said about the work done to provide the unique prototypes for ALICE. A description of developed software that converts textual content into AIML format is provided which explains the distinctive texts, which are used within it. They also reported that the trials will find out the possibility of generating useful prototypes without the need of intricate machine learning algorithms. [2] Deshpande and Joshi claimed that chatbots are pc programs that can able to perform natural communication with people. They described about the progress of chatbots from a basic version to its modern version and in commercial sector as they robotize customer service and decrease human efforts. [3] Nishal, Sachin and Taranth claims, there are different approaches to build the chat bot, Different models used to build the chatbots are analyzed in this paper. These can also build using various platforms like messengers, cloud platforms, artificial technology and machine learning models and customize the dataset to provide better experience to the clients. [4] Palakurthi and Putnala created a chatbot

feature and API for College website. They explained what are the developments in AI and ML to improve services and established online chatbot device to assess the clients who access college website and the usage of tools that expose Artificial Intelligence strategies, which also includes NLP, allowing users to communicate with specific university. [5] Mengual-Andrés, S. & López-Meneses thought that chatbot play an important role in both teaching and learning purposes. Their chatbots can be implemented in the phone, which helps the clients to utilize it anywhere, and at any time. This chatbot provides resources based on smart technologies. [6] Smutny and Schreiberova designed their chatbots in the way for students to learn the given resources in their known languages. This chatbots are power packed with tools like artificial intelligence to customize the search requests. In their chatbots monitors the task assigned for the users and alerts them with respect to their priority order. [7] Adam and Wessel claimed that in AI based chatbots, the conversations happen between the machine and client. The request from the users is answered based on the dataset containing in it. To betterment the user experiences the artificial systems provide precision valued descriptive option. For each option, the artificial systems consist of unit reply data. [8] Suta and Mongkolnam built their chatbots based on many machines learning and deep learning models. Machine learning based chat bots try to learn by themselves based on the test sets and user inputs. This leads to upgradation of dataset in the chatbot and provides better performance during user's request. This chatbots provides good answers with respect to the queries. [9] Jwala and Raju analyzed different chatbots with different chatbots. Also, they built these chatbots using various platforms such as messengers, cloud platform, artificial technology and machine learning models. Their chatbots are able to upgrade themselves to provide better experience to the clients [10].

III. METHODOLOGY

For creating AI based smart assistant, we have created a json file. This file contains the intents of the customer. Intents means the target of the customer. We have created this smart assistant based on departmental store. The json file contains the intents where we have stored all our data. Intents in this file are compatible. Thus, we can modify the file depending upon the customer request.
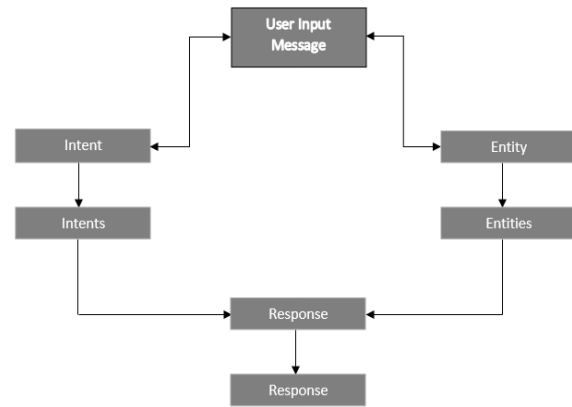

Fig.1. Architecture

We have trained our smart assistant using this json file such that it can acknowledge the user's aim and create response accordingly. We have used many libraries for implementing this smart assistant. One such thing is natural language tool kit (NLTK) which works with human language data. NLTK contains libraries for text modelling, processing and used for stemming, tokenization, classification etc. Java script object notation (json) is a language independent, which is used to send data between server and web applications. json loads json files directly into python. Pickle, which converts python object into a byte stream, store in a file and transport over a network and vice versa for unpickling. It loads the pickle file. NumPy performs the algebraic operations effectively. Last one is Keras, which is an open-source library for developing and analyzing deep learning models. As shown in fig2, when working with the raw data, we have performed many preprocessing techniques prior creating a machine-learning model. The techniques are to be performed based on the requirement. Tokenization is done with NLTK tokenize () function.

After tokenizing, we have performed lemmatization, removed duplicate words, and extracted the files documents from the intent file using NLTK modules and created the pickle file to store the objects. From these modules, we have created the training data where the user will give input and output (pattern). The machine does not understand the raw data. Hence, the raw data is converted into numbers using Bag of Words algorithm. The numbers are stored in the form ofvector format with its occurrence of each word.
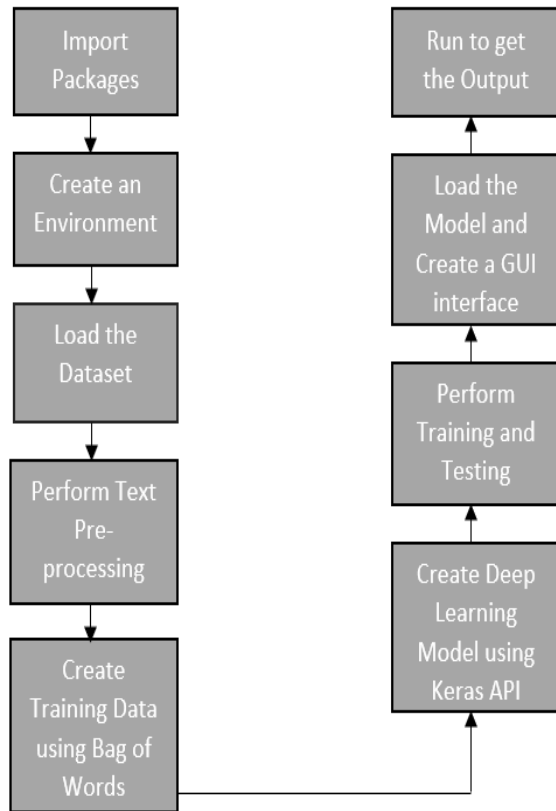
Fig.2. Flow diagram

With the data, we have built a deep neural network, which had tri-levels. Later, we optimized the neural model using the Stochastic Gradient Descent (SGD) optimizer. For this, we have used Keras sequential API. For predicting the response from the customer, we have loaded the trained model and predicted the response and displayed it on the GUI as shown in fig1. GUI interface can be implemented using the libraries of Tkinter.

IV. ANALYSIS AND TESTING

We can know where the specific information is at a specific time in our framework. So, we have to check out the progression of data. First and foremost, the client enters the query in the chat and taps on send. In the wake of tapping on send the inquiry is attributed to the deep learning model that is recently prepared sequential deep learning model. The model will give an intent list as a result then we look at the probabilities of unique expectation and the result intent. The intent with the higher likelihood is chosen and one respective response is randomly chosen from that tag and is shown to the client.

Fig.3. Output

We picked limit esteem analysis to test our smart assistant. We can't perform automated testing of our model utilizing tools in view of various result circumstances. We have fostered our smart assistant dependent on certain intents. An intent document can't have the option to portray all feasible scenarios that a client may ask a smart assistant to perform. That is the reason we want to test it dependent on limit esteems which are extremely feasible test cases and perceive how our smart assistant will react to it. We have tested the states of limit with valid test cases and some invalid test cases and saw whether we have received the exact response or not as shown in figure 3.

V. RESULT

Thus, the result of our smart assistant consistently varies, as it is a natural language smart assistant that can offer similar response in various ways. The smart assistant consistently continues to learn as the quantity of clients increase or use it more. The precision of the smart assistant additionally increments with the usage of the bot.

VI. CONCLUSION

Considering everything, we have made a smart assistant in python that can understand client questions and generate response accordingly. In the intent document, we trained our

smart assistant on. Additionally, we can increase a greater number of patterns and improve patterns, which will be useful when answering to the clients, and improves its precision. Deep Learning empowered smart assistants are turning out to be increasingly more well known, due to their applications and problems it can handle. It can likewise be extremely useful in educating and has a ton of utilizations in teaching outwardly impaired.

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