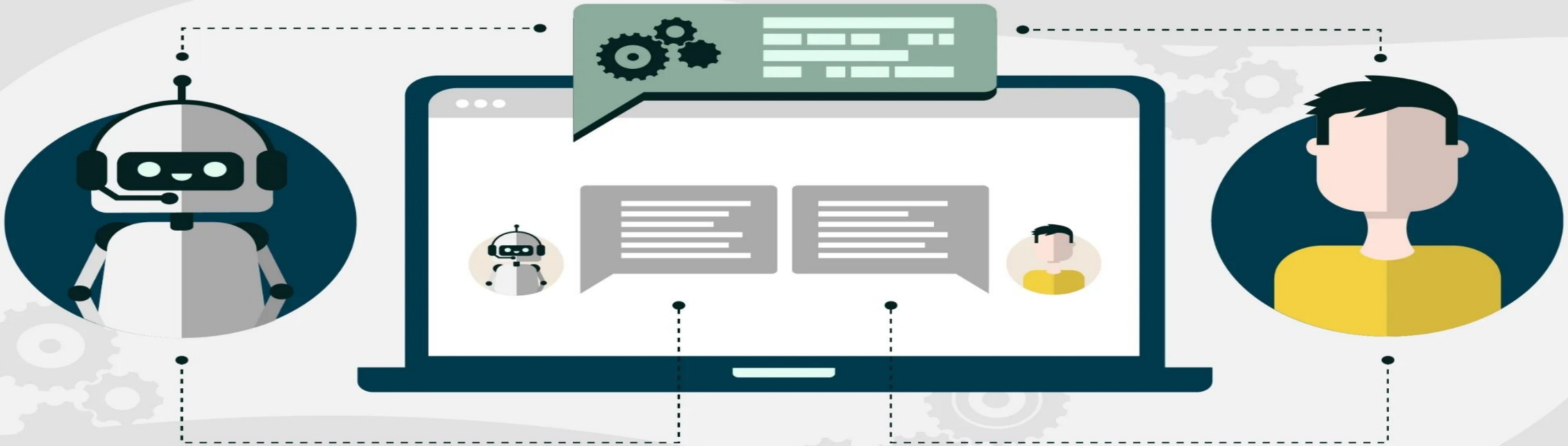
TITLE

Health Care Chatbot using Deep Learning and NLP



TECHIEXPERT

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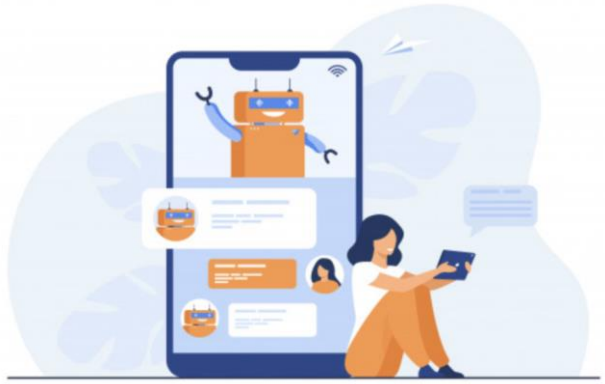
What are chatbots ?

- A chatbot is a computer program that takes the place of a natural human conversation online.

- A chatbot is an artificial intelligence (AI) program that can simulate a conversation (or a chat) with a user in natural language through messaging applications, websites, mobile applications or by phone.



Need For Chatbot ?

- **Save Human Resources for Qualitative Tasks**
- **Automated Customer Support For Similar Queries**
- **Accelerate Operations**
- **Chatbot- Easy-to-use**
- **Cost-effective and Time-efficient**
- **Improves Work With Minimum Effort**

Types of Chatbot? And which one is our ?

1. **Rule-Based Chatbots** – They follow a set of pre-defined rules or flows to respond to queries of a user. Most simple applications contain rule-based chatbots, which respond to questions based on the preset rules.

2. **AI Chatbots** – AI chatbots are more advanced and based on machine learning. AI chatbot uses natural language processing services to understand the meaning behind the questions posed.

AND WE HAVE CREATED AN "AI CHAT BOT"

Objective :

- Chat bots are mainly used to provide customer support.
- Can Schedule meetings, Broadcast newsletters, auto-sequences
- Chat bots are very intelligent. You train them once and they will communicate with your target audience in their language.

What is AI,ML and Deep Learning ?

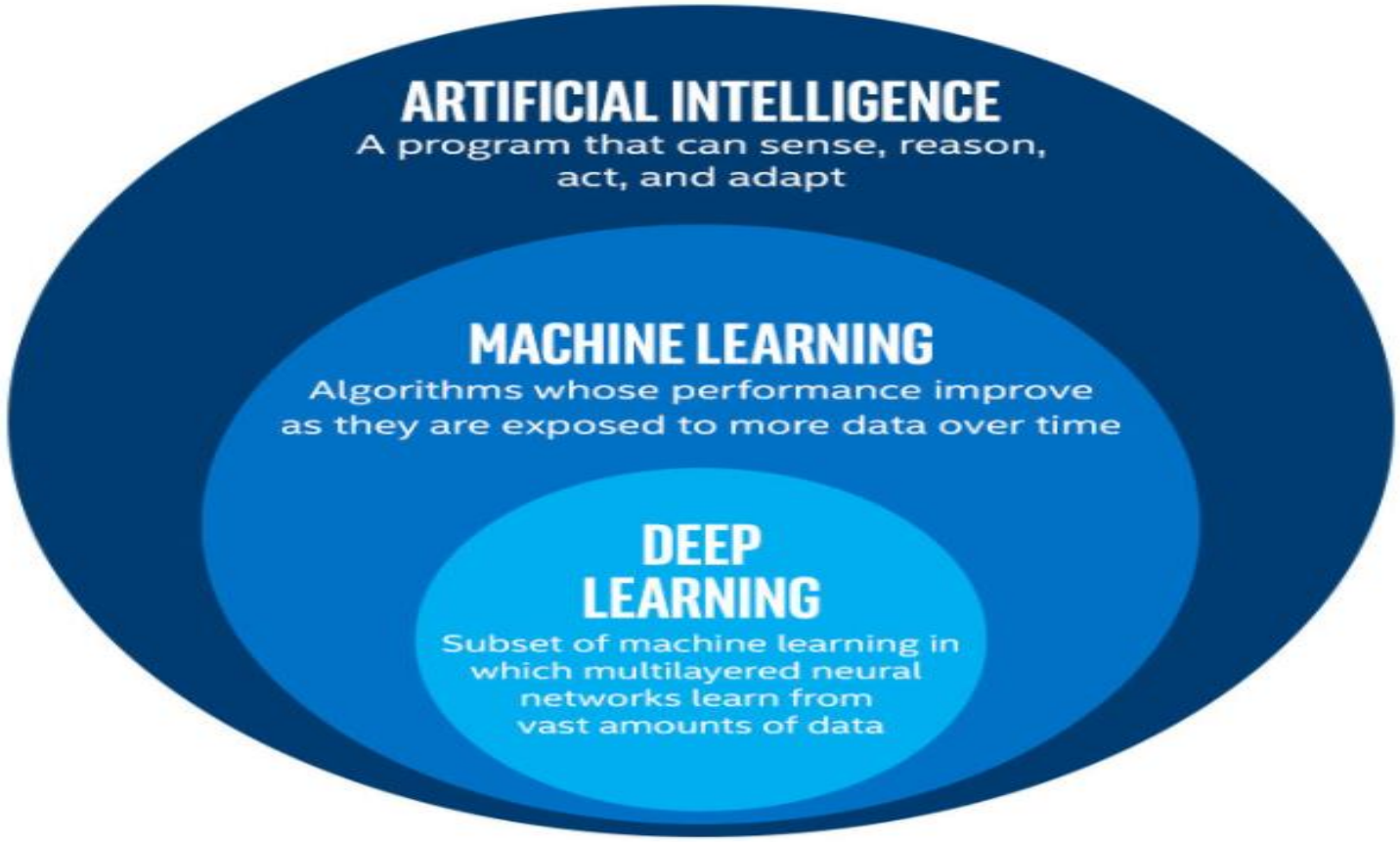


Fig.1

What is Deep Learning ?

- Deep learning is a technique that teaches computers to do what comes naturally to humans: learn by example. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign. It is the key to voice control in consumer devices like phones, tablets, TVs, and hands-free speakers.
- Deep learning is getting lots of attention lately and for good reason. It’s achieving results that were not possible before.
- Deep learning is basically a computer model which learn to perform task.
- Deep learning is basically an upgraded version of Machine learning and has some advanced features than machine learning.

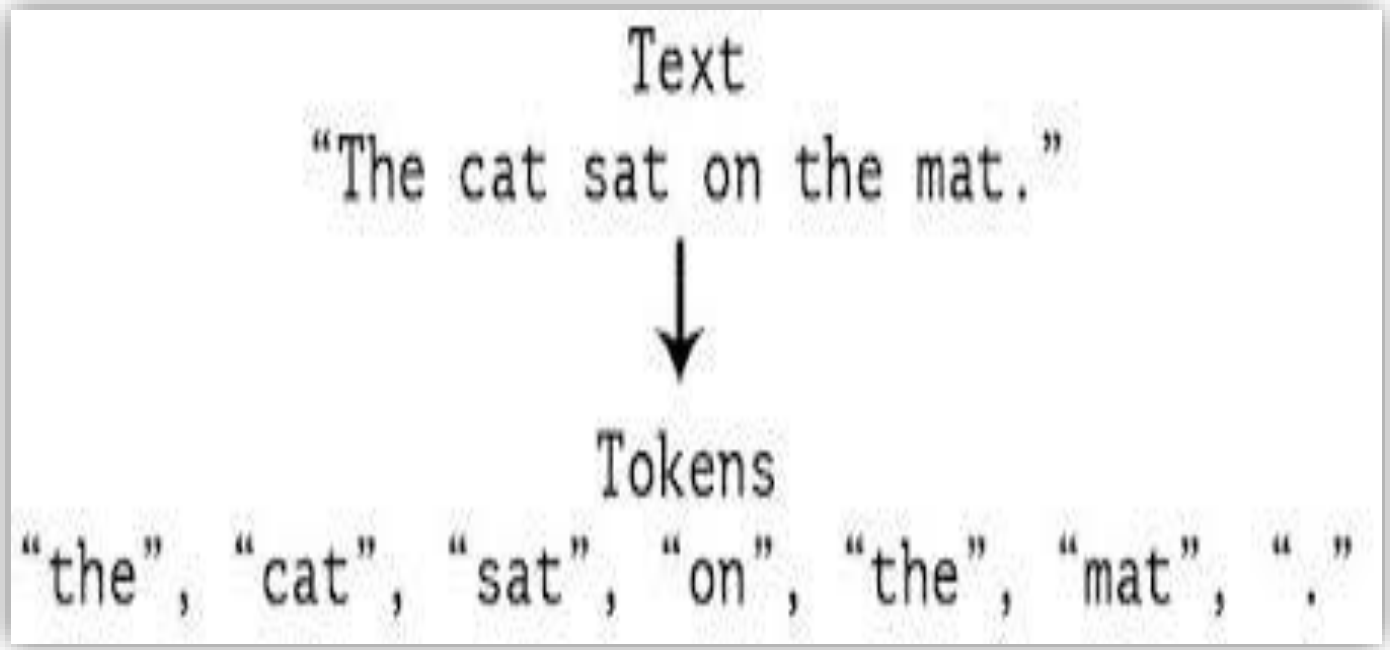
What is NLP ?

- NLP is basically Natural Language Processing.
- The field of study that focuses on the interactions between human language and computers is called Natural Language Processing
- NLP is used to analyze text, allowing machines to understand what human's had text.
- NLP are based on Machine Learning and especially statistical learning which uses a general learning algorithm.
- So using Deep learning we are going to solve basic NLP tasks.
- The basics concepts of NLP we will use are Stemming, tokenization, Training Data.

Tokenization :

- Breaking down a big string or sentence of data into words is known as Tokenization.
- It splits a piece of text into individual words based on a certain delimiter. Depending upon delimiters, different word-level tokens are formed.
- In our project the delimiter used is Space Seperated Value.

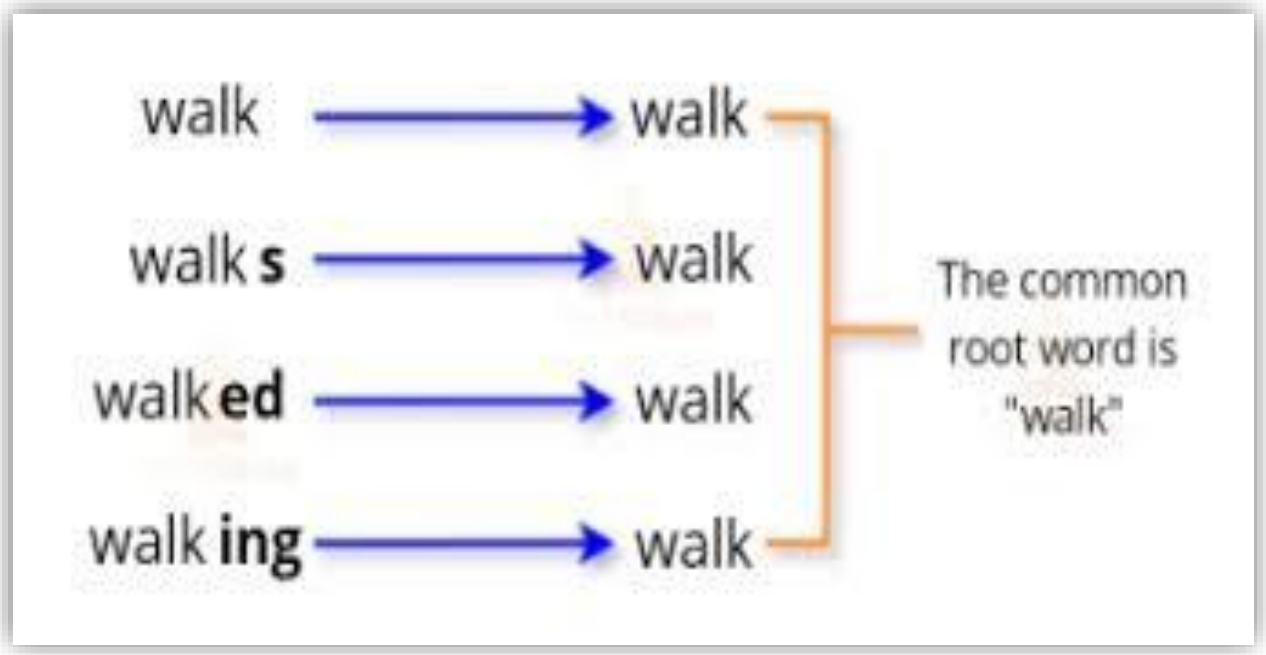
Tokenization :



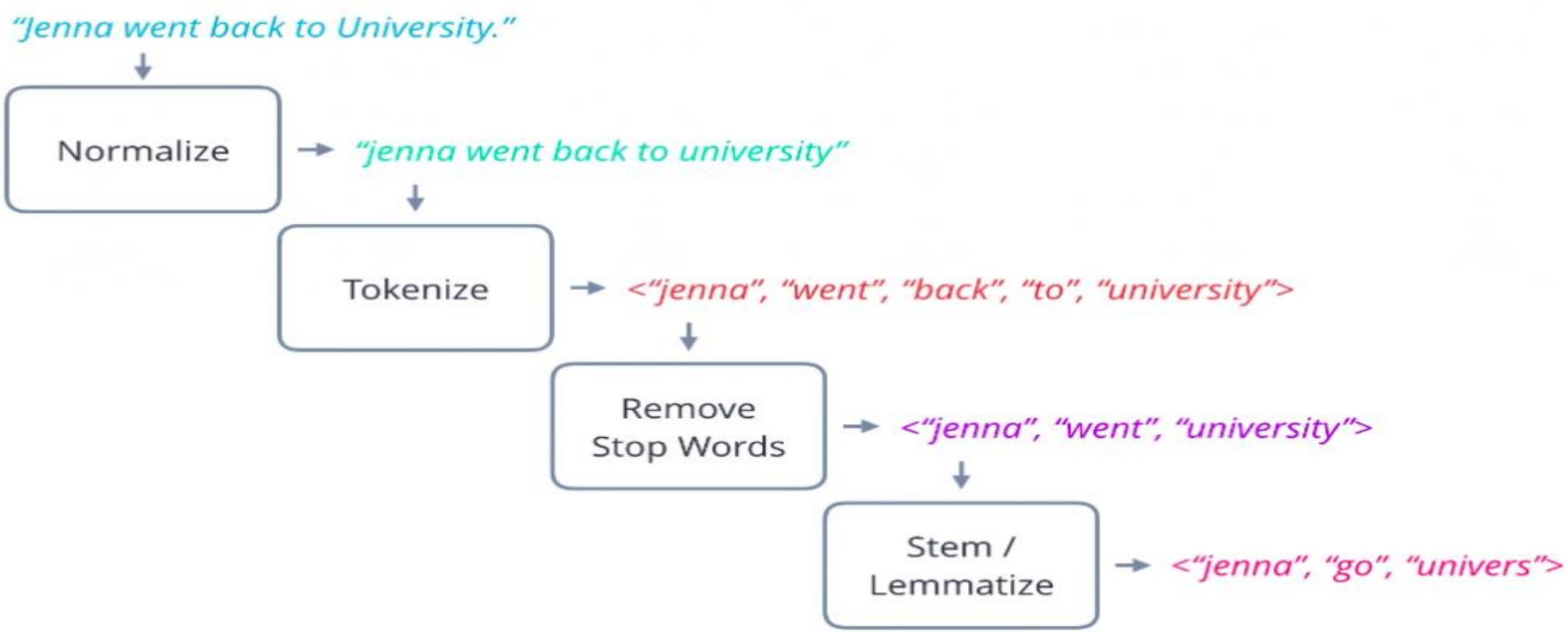
Stemming :

- Stemming is used to generate the root form of the word by chopping the rest part of the words. And also helps in lower casing the words.
- We used Porter Stemmer Algorithm in our project.

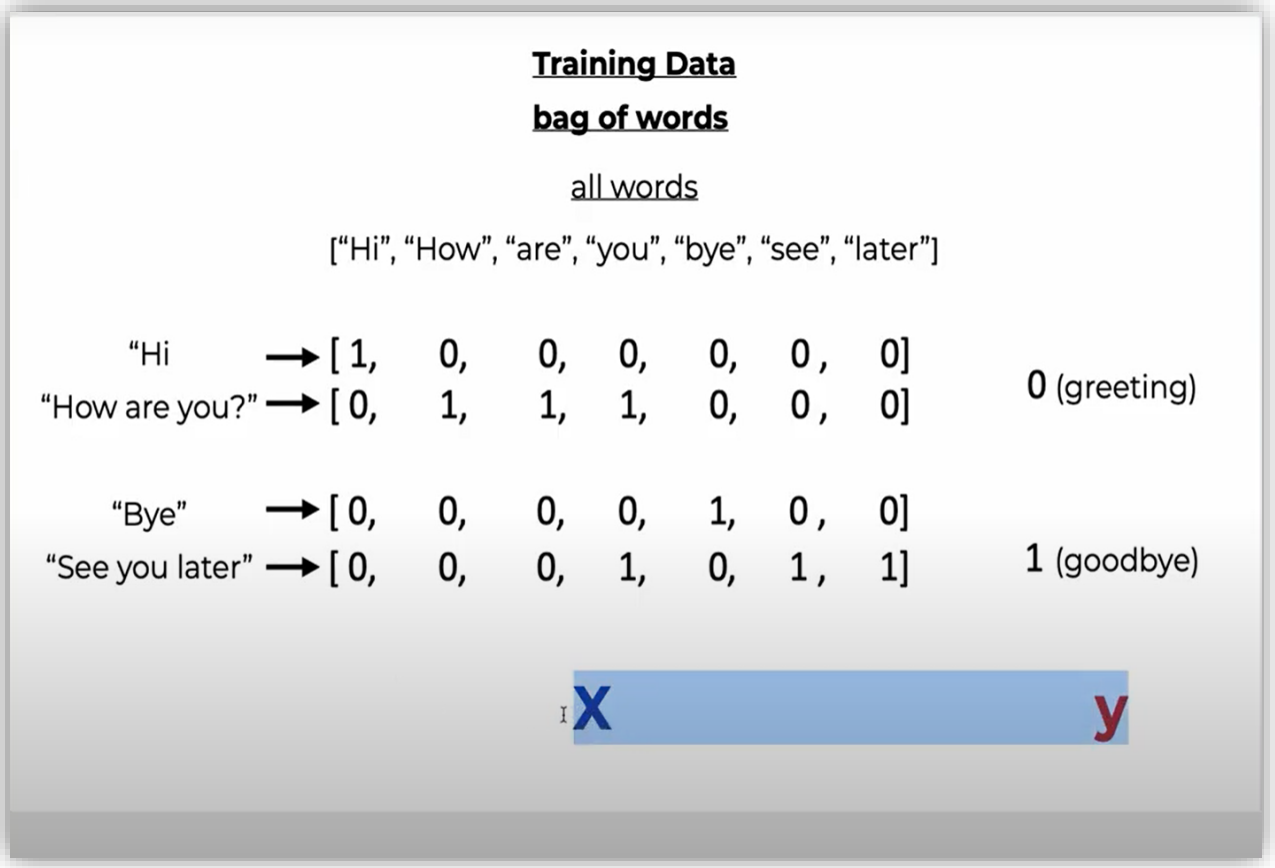
Stemming :


walk
walk
walk s
walk
walk ed
walk
walk ing
walk
The common root word is "walk"

Example:-


"Jenna went back to University."
Normalize
"jenna went back to university"
Tokenize
<"jenna", "went", "back", "to", "university">
Remove
Stop Words
<"jenna", "went", "university">
Stem /
Lemmatize
<"jenna", "go", "univers">

Bag of Words :


Training Data
bag of words
all words
["Hi", "How", "are", "you", "bye", "see", "later"]
"Hi → [1, 0, 0, 0, 0, 0 , 0]
"How are you?" → [0, 1, 1, 1, 0, 0 , 0]
0 (greeting)
"Bye" → [0, 0, 0, 0, 1, 0 , 0]
"See you later" → [0, 0, 0, 1, 0, 1 , 1]
1 (goodbye)
X
y

Feed Forward Neural Net :

- A feedforward neural network is an artificial neural network wherein connections between the nodes do not form a cycle.
- The feedforward neural network was the first and simplest type of artificial neural network devised. In this network, the information moves in only one direction forward from the input nodes, through the hidden nodes and to the output nodes.
- We trained our model using feed forward neural network.

Neural Net :

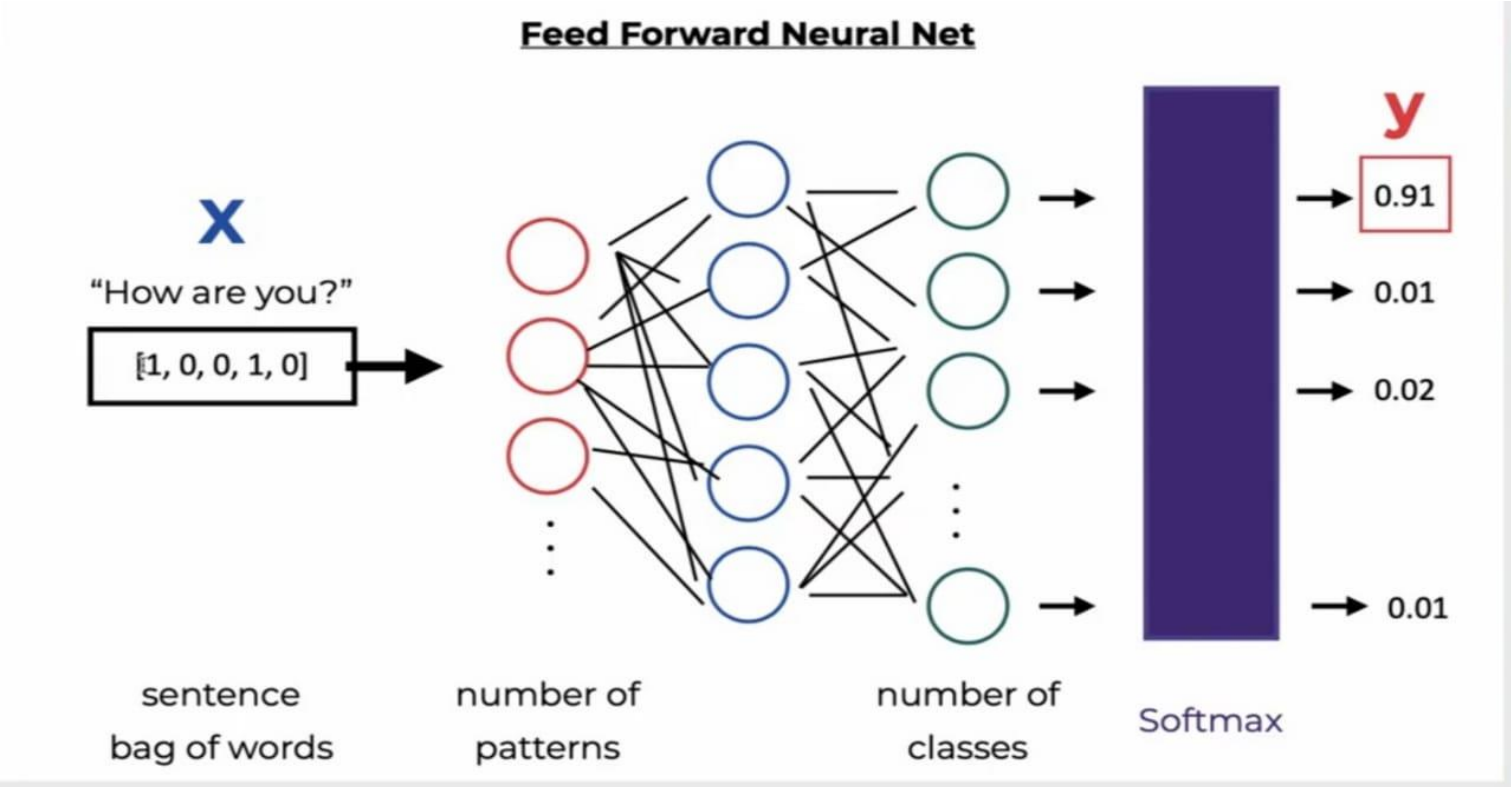


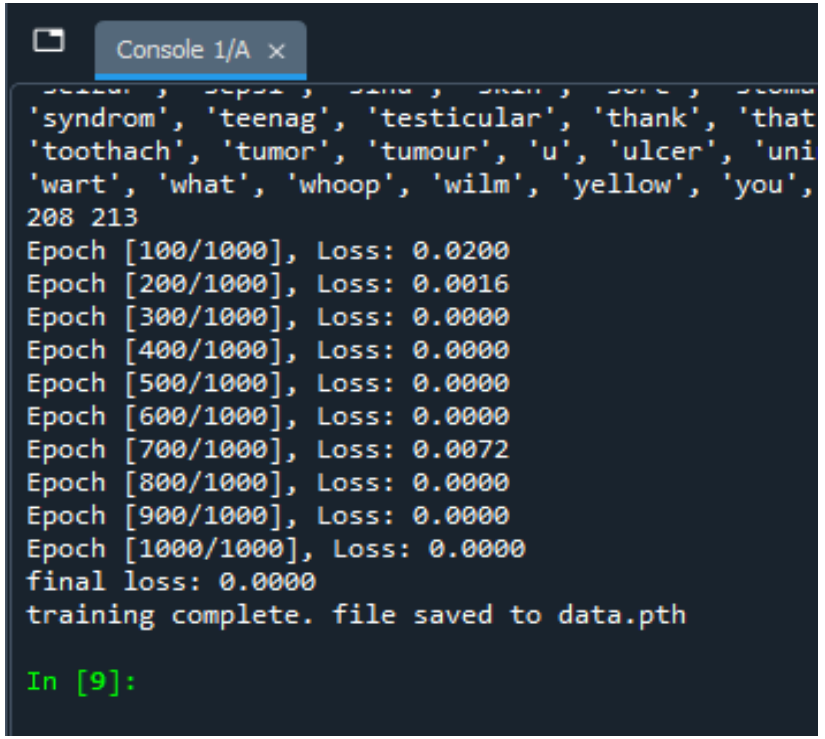
Fig.7

Training of data :

- In training of data we train our dataset(.json file) which consist of intent and in that intent there are multiple tag which has various patterns and responses.
- Tokenization, Stemming and Bag of word are applied on the patterns and tags. And both are stored in an array.
- The data of patterns and tag is passed on to the Neural net.
- After that for loop of epoch is applied to it which helps in computing the loss.
- After the completion of training the trained data is stored in a file.

Training of data :

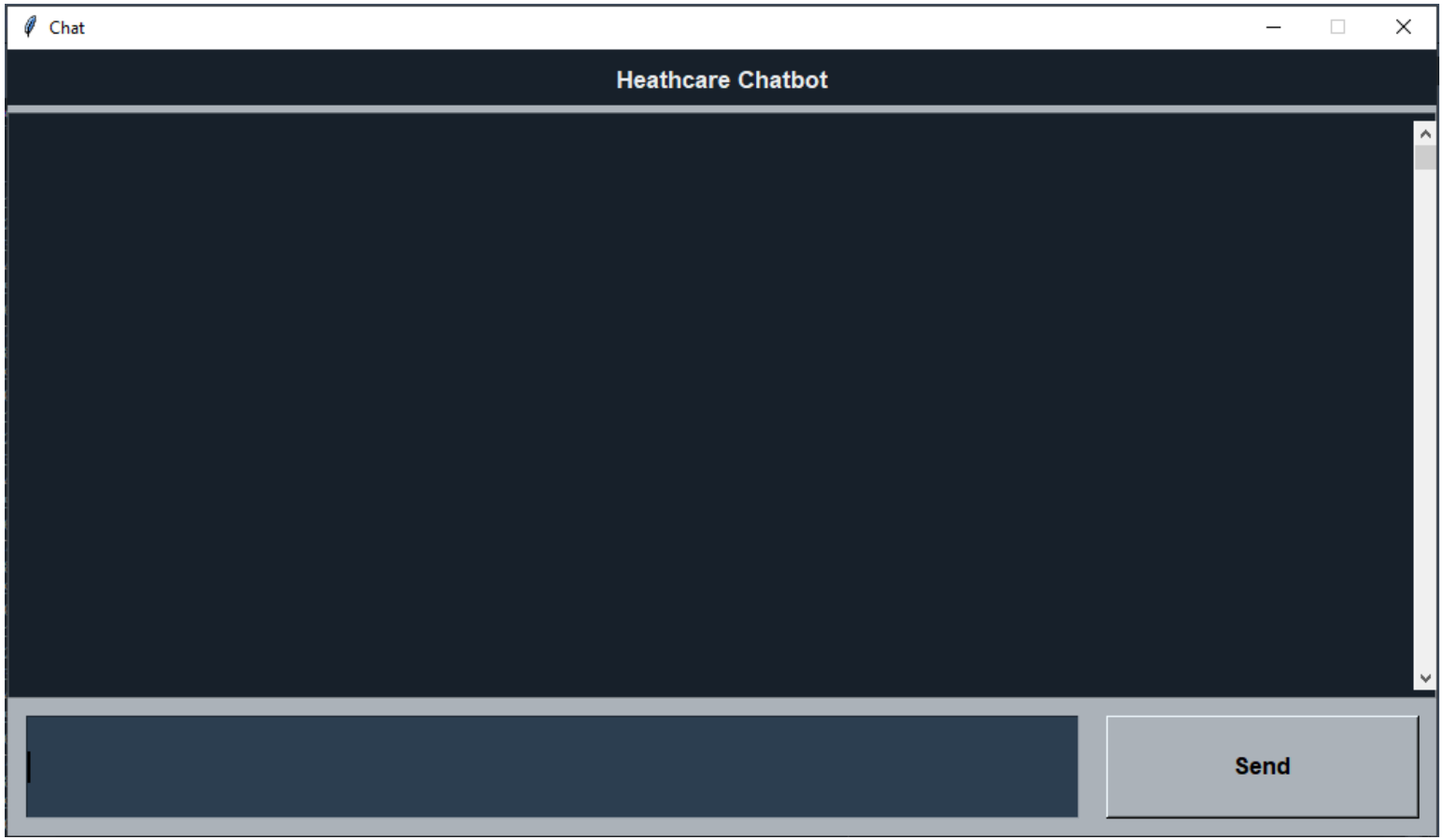
Training of data :



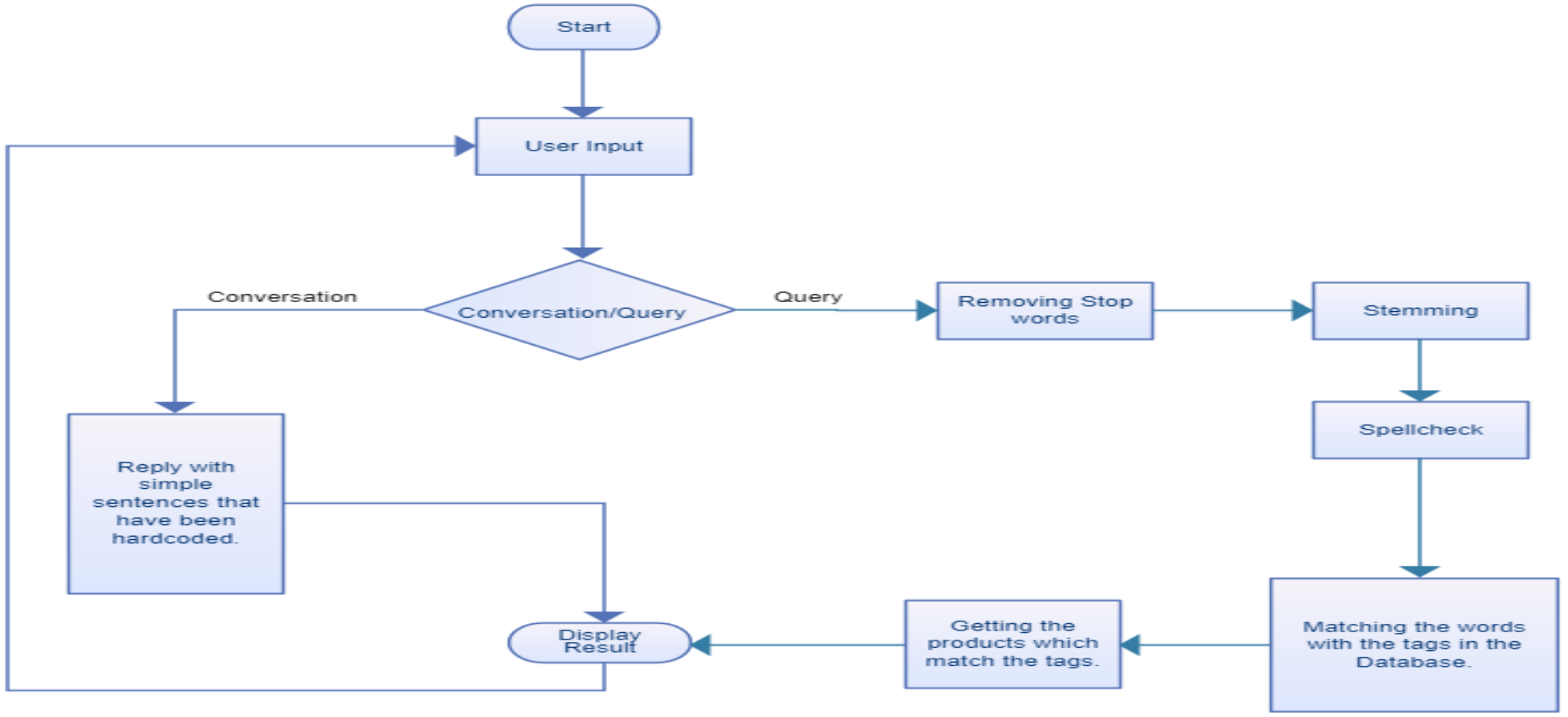
Tkinter :

- 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 Tkinter GUI toolkit.
- Tkinter provides various controls, such as buttons, labels and text boxes used in a GUI application. These controls are commonly called widgets.
- The GUI of Health care chatbot was created using tkinter.

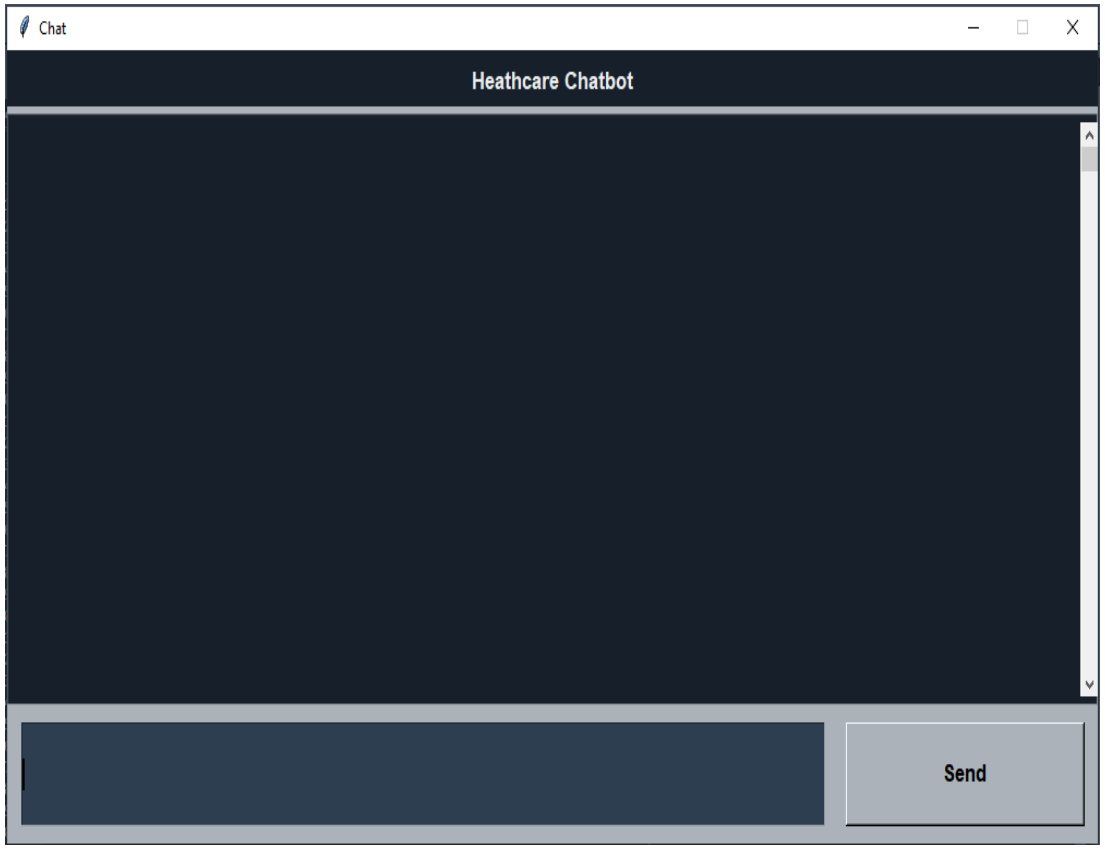
GUI :

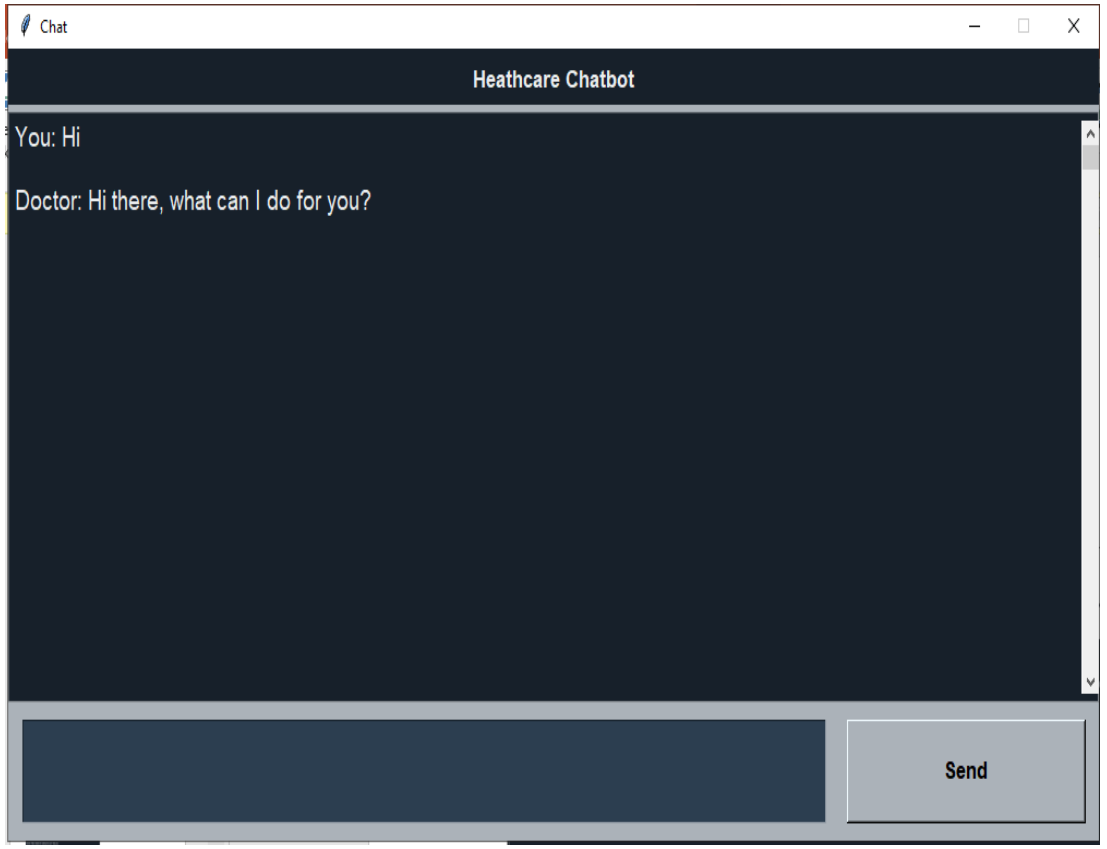


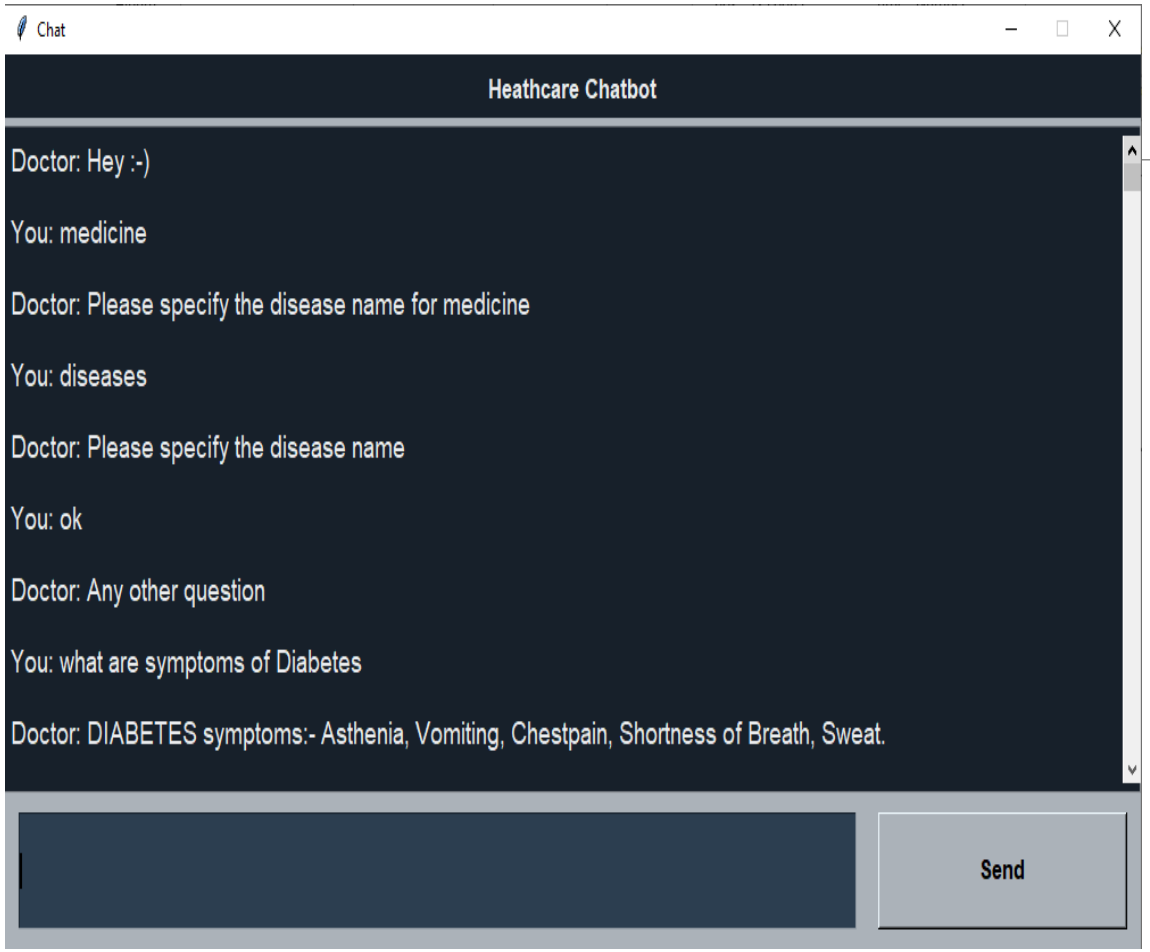
Flow Chart :

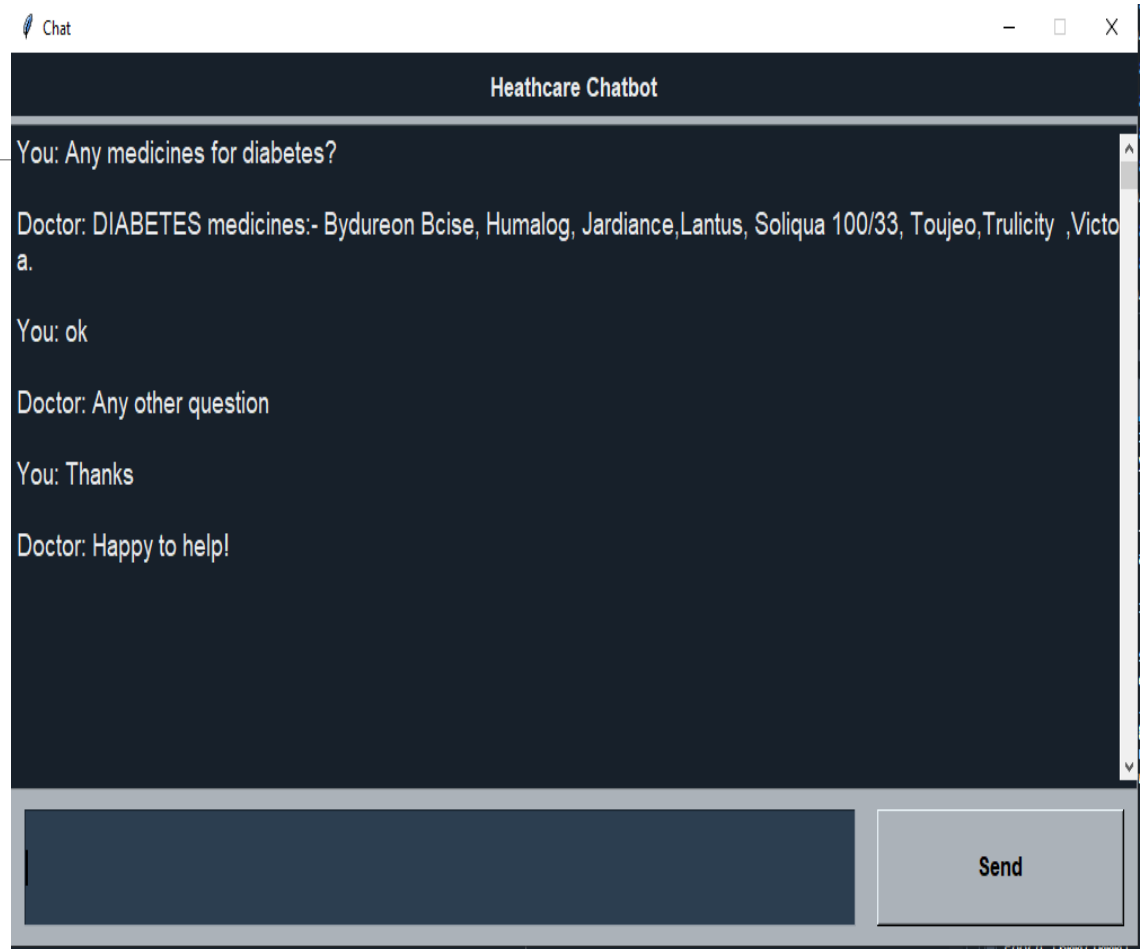

Start
User Input
Conversation/Query
Conversation
Query
Reply with simple sentences that have been hardcoded.
Removing Stop words
Stemming
Spellcheck
Matching the words with the tags in the Database.
Getting the products which match the tags.
Display Result

Working of chatbot:






Chat
Heathcare Chatbot
Doctor: Hey :-)
You: medicine
Doctor: Please specify the disease name for medicine
You: diseases
Doctor: Please specify the disease name
You: ok
Doctor: Any other question
You: what are symptoms of Diabetes
Doctor: DIABETES symptoms:- Asthenia, Vomiting, Chestpain, Shortness of Breath, Sweat.
Send


Chat
Heathcare Chatbot
You: Any medicines for diabetes?
Doctor: DIABETES medicines:- Bydureon Bcise, Humalog, Jardiance,Lantus, Soliqua 100/33, Toujeo,Trulicity ,Victo
a.
You: ok
Doctor: Any other question
You: Thanks
Doctor: Happy to help!
Send

Literature Survey & Paper Review :

No.	Paper Title	Authors	Descriptions
1	**A Smart Chatbot Architecture based NLP and Machine learning for health care assistance**.	Soufyane Ayanouz,Mohammed Benhmed, Boudhir Anouar Abdelhakim	Explain importance of chatbot and how we improve it using NLP and ML according to the scientific community, **chatbots are user-friendly and any person who has an awareness of typing in their language on the desktop version and in the mobile application can use these chatbots very easily**
2	**An Intelligent Chat-bot using Natural Language Processing**	Rishabh Shah, Siddhant Lahoti, Prof. Lavanya. K	Experiment with **small dataset with some dynamic variables and different algorithm,** Different algorithms have been used and with technology evolving the retrieval process including the triggering part is getting faster.
3	**BANK CHAT BOT – An Intelligent Assistant System Using NLP and Machine Learning**	Chaitrali S. Kulkarni,Amruta U. Bhavsar, Savita R. Pingale, Prof.Satish S.Kumbhar	They have **entered queries which are similar to the questions asked while creating bank accounts.** The analysis of the result is as 87% correct answer and 13% incorrect answer

No.	Papers	Authors	Description
4	**Chatbot using NLP and Deep Learning**	Ravi Khevaria	**Training the dataset now the chatbot is tested by running various commands in the terminal.** After training the model now the chatbot is ready to be tested. The output generated by the chatbot has moderate relevancy
5	**Implementation of a Chatbot System using AI and NLP**	Tarun Lalwani,Shashank Bhalotia, Ashish Pal,Shreya Bisen, Vasundhara Rathod	**The purpose of a chatbot system is to simulate a human conversation**. Its architecture integrates a language model and computational algorithm to emulate information online communication between a human and a computer using natural language

Scope :

Creating chatbot using deep learning and nlp have great scope in future because both of them are well known technology in the AI world and using them we can improve the link between computers and human much better.

Conclusion :

The main objectives of the project is to develop an chatbot using DL and NLP that will answer to user about diseases , symptoms and medicine. Basically in this we have used basic concept's of both NLP(Natural Language Processing) and DL(Deep Learning). First we used an raw data, basically a group of sentences and after cleaning the data we apply our DL models (Feed Forward Neural Net) which will provides the expected results, and using the GUI we will interact with the Chatbot . So in this way we are going to accomplished the chatbot which uses deep learning and NPL.

Reference :

https://chatbotsmagazine.com/contextual-chat-bots-with-tensorflow-4391749d0077

https://sloboda-studio.com/blog/how-to-use-nlp-for-building-a-chatbot/

https://www.google.com/

https://www.nhsinform.scot/illnesses-and-conditions/a-to-z

https://www.nltk.org/

https://towardsdatascience.com/top-deep-learning-articles-of-2020-2b9a8c869875