

Report On AI Health Care Chatbot for COVID-19

**Bachelor In Technology
(Information Technology)**



**SCHOOL OF CSE (LPU)
PHAGWARA**

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CONTENTS

s.no.	Particulars	Page. No.
1	Page Title	1
2	Content	2
3	Introduction & Overview Of Project	3
4	Technology Use & requirements	6
5	Scope Of the Project	7
6	Screenshots	8
7	Algorithms & Steps	10
8	Conclusion And Future Scope	13

Introduction to the Project

A **chatbot** is an artificial intelligence-powered piece of software in a device (Siri, Alexa, Google Assistant etc), application, website or other networks that try to gauge consumer's needs and then assist them to perform a particular task like a commercial transaction, hotel booking, form submission etc . Today almost every company has a chatbot deployed to engage with the users. Some of the ways in which companies are using chatbots are:

- To deliver flight information
- to connect customers and their finances
- As customer support

In this Model we had designed a Bot which can answer all your question related to COVID-19 healthcare.

Overview

1.1

There are broadly two variants of chatbots: **Rule-Based** and **Self-learning**.

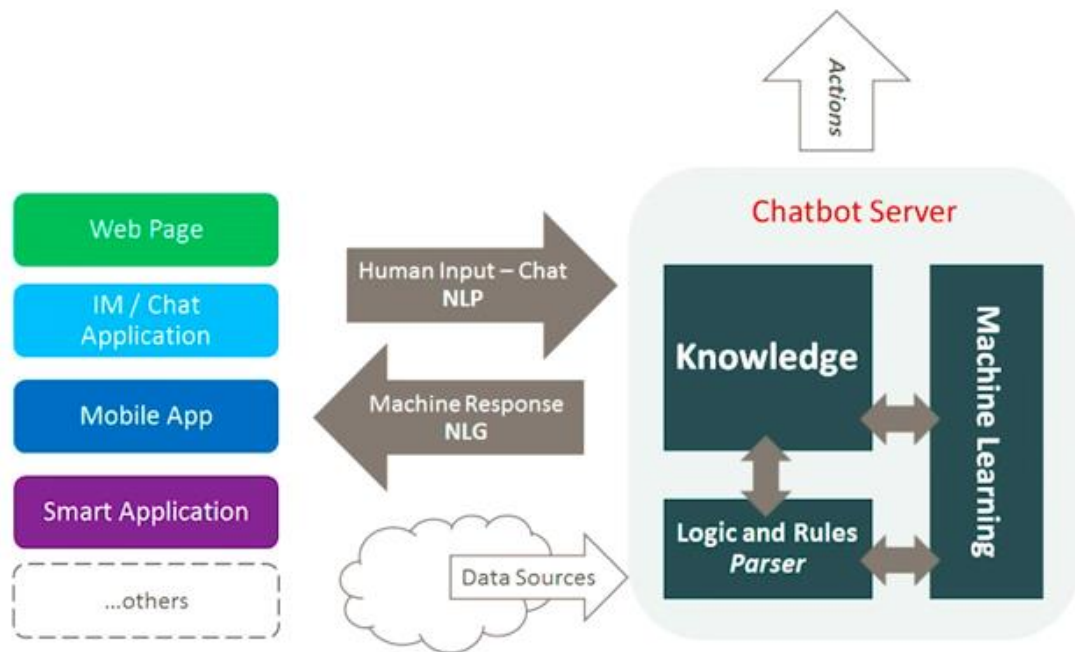
1. In a **Rule-based approach**, a bot answers questions based on some rules on which it is trained on. The rules defined can be very simple to very complex. The bots can handle simple queries but fail to manage complex ones.
2. Self-learning bots are the ones that use some Machine Learning-based approaches and are definitely more efficient than rule-based bots. These bots can be of further two types: **Retrieval Based** or **Generative**

i) In **retrieval-based models**, a chatbot uses some heuristic to select a response from a library of predefined responses. The chatbot uses the message and context of the conversation for selecting the best response from a predefined list of bot messages. The context can include a current position in the dialogue tree, all previous messages in the conversation, previously saved variables (e.g. username). Heuristics for selecting a response can be engineered in many different ways, from rule-based if-else conditional logic to machine learning classifiers.

ii) **Generative** bots can generate the answers and not always replies with one of the answers from a set of answers. This makes them more intelligent as they take word by word from the query and generates the answers.

Anatomy Of Chatbot:

Anatomy of a Chatbot



Technology Use And Requirements

Building the Bot

Pre-requisites

Hands-On knowledge of **scikit** library and **NLTK** is assumed. However, if you are new to NLP, you can still read the article and then refer back to resources.

NLP

The field of study that focuses on the interactions between human language and computers is called Natural Language Processing, or NLP for short. It sits at the intersection of computer science, artificial intelligence, and computational linguistics[Wikipedia].NLP is a way for computers to analyze, understand, and derive meaning from human language in a smart and useful way. By utilizing NLP, developers can organize and structure knowledge to perform tasks such as automatic summarization, translation, named entity recognition, relationship extraction, sentiment analysis, speech recognition, and topic segmentation.

NLTK: A Brief Intro

NLTK(Natural Language Toolkit) is a leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces to over 50 corpora and lexical resources such as WordNet, along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning, wrappers for industrial-strength NLP libraries.

NLTK has been called “a wonderful tool for teaching and working in, computational linguistics using Python,” and “an amazing library to play with natural language.”

Natural Language Processing with Python provides a practical introduction to programming for language processing. I highly recommend this book to people beginning in NLP with Python.

Bag of Words:

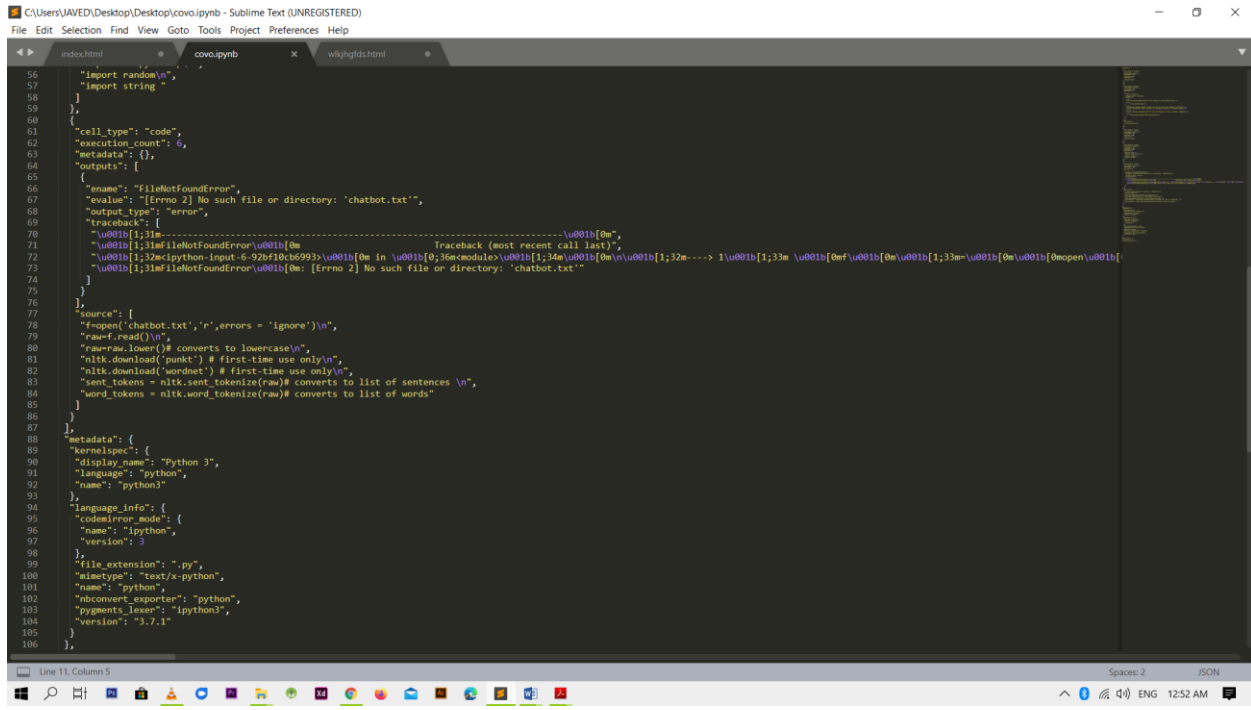
After the initial preprocessing phase, we need to transform the text into a meaningful vector (or array) of numbers. The bag-of-words is a representation of text that describes the occurrence of words within a document. It involves two things:

- A vocabulary of known words.
- A measure of the presence of known words.

Requirements:

- Microsoft® Windows® 7/8/10 (32- or 64-bit), Ubuntu, Mac OS, Linux
- 1 GB RAM minimum, 2 GB RAM recommended, 2 GB of available disk space
- NLTK Kit
- Python IDE

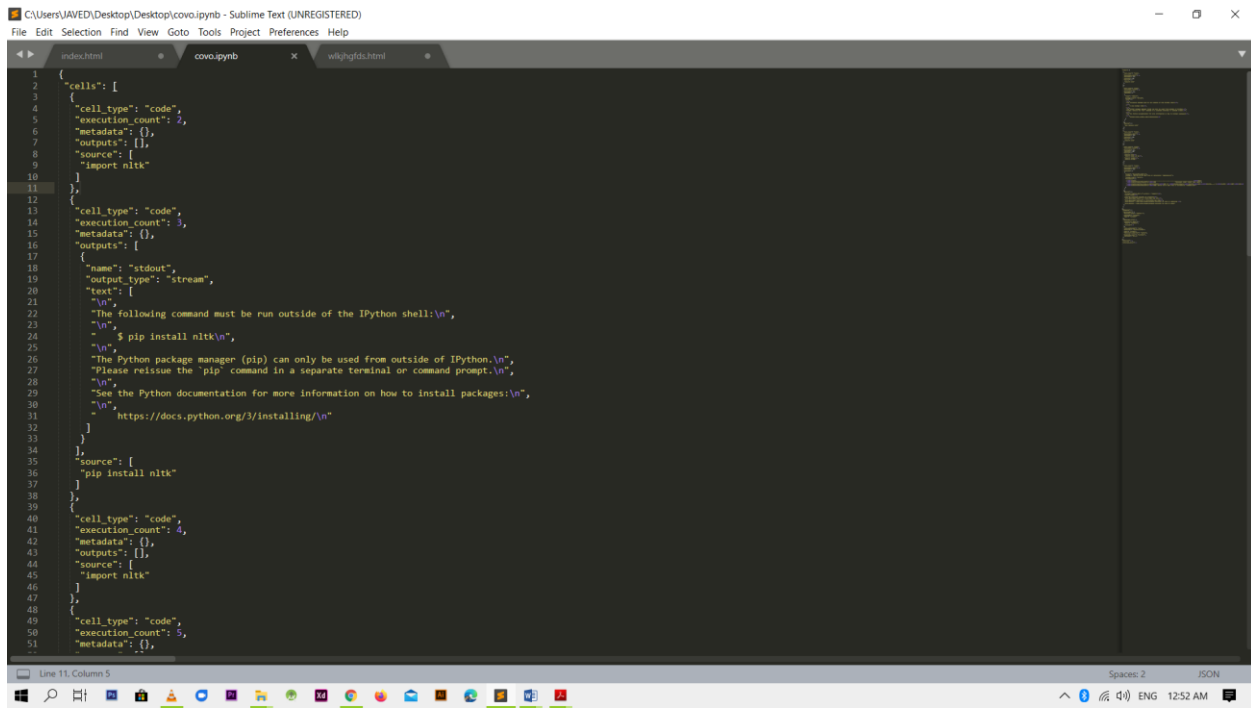
Screenshots



The screenshot shows a Sublime Text editor window with the file path `C:\Users\JAVED\Desktop\Desktop\covo.ipynb`. The editor displays a Jupyter Notebook cell with the following Python code:

```
56 import random\n57 import string\n58\n59\n60 {\n61   \"cell_type\": \"code\", \n62   \"execution_count\": 6, \n63   \"metadata\": {}, \n64   \"outputs\": [\n65     {\n66       \"ename\": \"FileNotFoundError\", \n67       \"value\": \"[Errno 2] No such file or directory: 'chatbot.txt'\", \n68       \"output_type\": \"error\", \n69       \"traceback\": [\n70         \"\u001b[1;31m-----\u001b[0m\", \n71         \"\u001b[1;31mFileNotFoundError: \u001b[0m\", \n72         \"\u001b[1;31mFileNotFoundError: \u001b[0m\", \n73         \"\u001b[1;31mFileNotFoundError: \u001b[0m\", \n74       ]\n75     }\n76   ]\n77   \"source\": [\n78     \"f=open('chatbot.txt','r',errors='ignore')\n79     \"f.read()\n80     \"raw=raw.lower()# converts to lowercase\n81     \"nltk.download('punkt') # first-time use only\n82     \"nltk.download('wordnet') # first-time use only\n83     \"sent_tokens = nltk.sent_tokenize(raw)# converts to list of sentences\n84     \"word_tokens = nltk.word_tokenize(raw)# converts to list of words\n85   ]\n86 }\n87\n88\n89\n90\n91\n92\n93\n94\n95\n96\n97\n98\n99\n100\n101\n102\n103\n104\n105\n106
```

The error message indicates a `FileNotFoundError` for the file `chatbot.txt`. The traceback shows the error occurred in the `open` function call. The status bar at the bottom indicates the current position is Line 11, Column 5, with 2 spaces and JSON formatting.



The screenshot shows a Sublime Text editor window with the file path `C:\Users\JAVED\Desktop\Desktop\covo.ipynb`. The editor displays a Jupyter Notebook cell with the following Python code:

```
1 {\n2   \"cells\": [\n3     {\n4       \"cell_type\": \"code\", \n5       \"execution_count\": 2, \n6       \"metadata\": {}, \n7       \"outputs\": [\n8         {\n9           \"source\": [\n10            \"import nltk\n11          ]\n12        },\n13        {\n14          \"cell_type\": \"code\", \n15          \"execution_count\": 3, \n16          \"metadata\": {}, \n17          \"outputs\": [\n18            {\n19              \"name\": \"stdout\", \n20              \"output_type\": \"stream\", \n21              \"text\": [\n22                \"\n23                \"The following command must be run outside of the IPython shell:\n24                \"\n25                \"$ pip install nltk\n26                \"\n27                \"The Python package manager (pip) can only be used from outside of IPython.\n28                \"Please reissue the 'pip' command in a separate terminal or command prompt.\n29                \"See the Python documentation for more information on how to install packages:\n30                \"\n31                \"https://docs.python.org/3/installing/\n32              ]\n33            }\n34          ]\n35        },\n36        {\n37          \"source\": [\n38            \"pip install nltk\n39          ]\n40        },\n41        {\n42          \"cell_type\": \"code\", \n43          \"execution_count\": 4, \n44          \"metadata\": {}, \n45          \"outputs\": [\n46            {\n47              \"source\": [\n48                \"import nltk\n49              ]\n50            }\n51          ]\n52        }\n53      ]\n54    }\n55  ]\n56}
```

The code shows the installation of the `nltk` package using `pip`. The status bar at the bottom indicates the current position is Line 11, Column 5, with 2 spaces and JSON formatting.


```
1 It is an infectious disease caused by a new virus.The disease causes respiratory illness (like the flu) with symptoms such as a cough, fever, and in more severe cases, difficulty breathing.You can
2 protect yourself by washing your hands frequently, avoiding touching your face, and avoiding close contact (1 meter or 3 feet) with people who are unwell.
3
4
5 I can answer all your concern related covid-19.
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14 The most common symptoms of COVID-19 are fever, tiredness, dry cough.Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild
15 and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell.Most people (about 80%) recover from the disease without needing special treatment. Around 1
16 out of every 6 people who gets COVID-19 becomes seriously ill and develops difficulty breathing.
17
18 Preventive Measures are:
19 1. Wash your hands frequently
20 2. Avoid touching your eyes, mouth and nose
21 3. Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze
22 4. Avoid crowded places
23 5. Stay at home if you feel unwell - even with a slight fever and cough
24 6. If you have a fever, cough and difficulty breathing, seek medical care early - but call by phone first.
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35 People of all ages CAN be infected by the coronavirus.Older people, and people with pre-existing medical conditions (such as asthma, diabetes, heart disease) appear to be more vulnerable to
36 becoming severely ill with the virus.
37
38
39
40
41
42
43
44
45
46 Myths of corona are:
47 1. Cold weather and snow CANNOT kill the coronavirus
48
```

ROBO: My name is Robo. I will answer your queries about Chatbots. If you want to exit, type Bye!
hi
ROBO: I am glad! You are talking to me

Scope Of The Project

- This chatbot have a potential to handle out the concern related to covid-19
- Many times patients need a quick piece of advice.It can help you out at such situation.
- The queries would be answered as per the history and current situation.

Algorithms

- **Importing the necessary libraries**

```
import nltk
import numpy as np
import random
import string # to process standard python strings
```

- **Reading in the data**

- We will read in the corpus.txt file and convert the entire corpus into a list of sentences and a list of words for further pre-processing.

- **Pre-processing the raw text**

- We shall now define a function called LemTokens which will take as input the tokens and return normalized tokens.

- **Keyword matching**

- Next, we shall define a function for a greeting by the bot i.e if a user's input is a greeting, the bot shall return a greeting response.

- **Generating Response**

To generate a response from our bot for input questions, the concept of document similarity will be used. So we begin by importing the necessary modules.

- From scikit learn library, import the Tfidf vectorizer to convert a collection of raw documents to a matrix of TF-IDF features.

```
from sklearn.feature_extraction.text
import TfidfVectorizer
```

- Also, import cosine similarity module from scikit learn library
from sklearn.metrics.pairwise import cosine_similarity
- We define a function **response** which searches the user's utterance for one or more known keywords and returns one of several possible responses. If it doesn't find the input matching any of the keywords, it returns a response: "I am sorry! I don't understand you"

Finally, we will feed the lines that we want our bot to say while starting and ending a conversation depending upon the user's input.

Conclusion:

After careful observation Though it is a very simple bot with hardly any cognitive skills, its a good way to get into NLP and get to know about chatbots. Though 'COVO' responds to user input. We Can implement this module into medical and healthcare unit or portal. It can help you out to handle medical and health concerns.

Bibliography:

Web links:

- <https://www.stackoverflow.com>
- <https://www.github.com>
- <https://www.youtube.com>
- <https://geeksforgeeks.com>

Responsibility:

Javed Khan : Complete Coding Part and explanation
Aniket : Corpus Designing
Manikanta : Questionnaires and Testing
Sagar Bhandari : Testing & Report