MEDICAL CHATBOT USING ARTIFICIAL INTELLIGENCE

Under the guidance of
Mr. APPIREDDY V NAGIREDDY
(Assistant Professor, Department of CSE)

Team Number : 13
18BD1A058D
18BD1A058R
18BD1AO58V
18BD1A059H

OUTLINE

- ABSTRACT
- INTRODUCTION
- SOFTWARE REQUIREMENTS SPECIFICATION
- LITERATURE SURVEY
- SYSTEM DESIGN
- IMPLEMENTATION
- TEST CASES
- CONCLUSION
- REFERENCES

ABSTRACT

- To lead a good life healthcare is very much important. But it is very difficult to obtain the consultation with the doctor in case of any health issues.
- The proposed idea is to create a medical chatbot using Artificial Intelligence that can diagnose the disease and provide basic details about the disease before consulting a doctor.
- To reduce the healthcare costs and improve accessibility to medical knowledge the medical chatbot is built.
- Chatbots acts as a medical reference books, which helps the patient know more about their disease and helps to improve their health.

INTRODUCTION

- The aim of this project is to create a self-diagnosis medical chatbot using Artificial Intelligence.

- Artificial intelligence (AI) is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment.

- Artificial Intelligence applications include advanced web search engines (i.e. Google), recommendation systems (used by YouTube), understanding human speech (such as Siri or Alexa), self-driving cars (e.g. Tesla).

- A chatbot is a computer program which conducts a conversation via text or text-to-speech. For various practical purposes like customer service or information acquisition, chatbot is being used in the dialog system.

INTRODUCTION

Existing System:

- There are certain chatbots in the medical field that already exists, but current implementations focus on quickly diagnosing patients by identifying symptoms based on pure system initiative questions like natural conversation.

- Our system focuses solely on the analysis of natural language to extract symptoms, which could make it easier for elderly, less technical users to communicate their symptoms.

INTRODUCTION

Proposed System:

- The proposed system proceeds from symptom extraction, to symptom mapping, where it identifies the corresponding symptom, then diagnosis the patient whether it's a major or minor disease.
- If it's a major one an appropriate doctor will be referred to the patient, the doctor details will be extracted from the database.
- The user will be identified by the login details which is stored in the database.

INTRODUCTION

Scope of the Project:

- The user can access the chatbot through a webpage.
- It can be accessed by various devices like laptops, smartphones, tablets etc. by a browser.
- The usage of Chatbot is user friendly and can be used by any person who knows how to type in mobile app or desktop version.

SOFTWARE REQUIREMENTS SPECIFICATION

Functional Requirements:

- New users must register in order to proceed further.
- Users must log in to access the chatbot.
- Users must enter the symptoms and the chatbot must respond accordingly.
- The reply should be realistic like talking to a human.
- Should be interactive, that is it should prompt the user what it should do next.

SOFTWARE REQUIREMENTS SPECIFICATION

Non-Functional Requirements:

- System use shall not cause any harm to human users.
- System will use a secured database.
- Every user is provided with a unique ID with their password.
- Every user is authenticated before accessing their account.

SOFTWARE REQUIREMENTS SPECIFICATION

Software Requirements:

- Operating System : Windows 10, Linux or MAC OS.
- Programming Language : Python, MySQL.
- Platform : Dialogflow.
- IDE : Visual Studio Code, Python.

Hardware Requirements:

- Processor : Intel core i3 and above.
- RAM : 2 GB or above.
- Internet : 1 Mbps or above.

SOFTWARE REQUIREMENTS SPECIFICATION

Software Technologies:

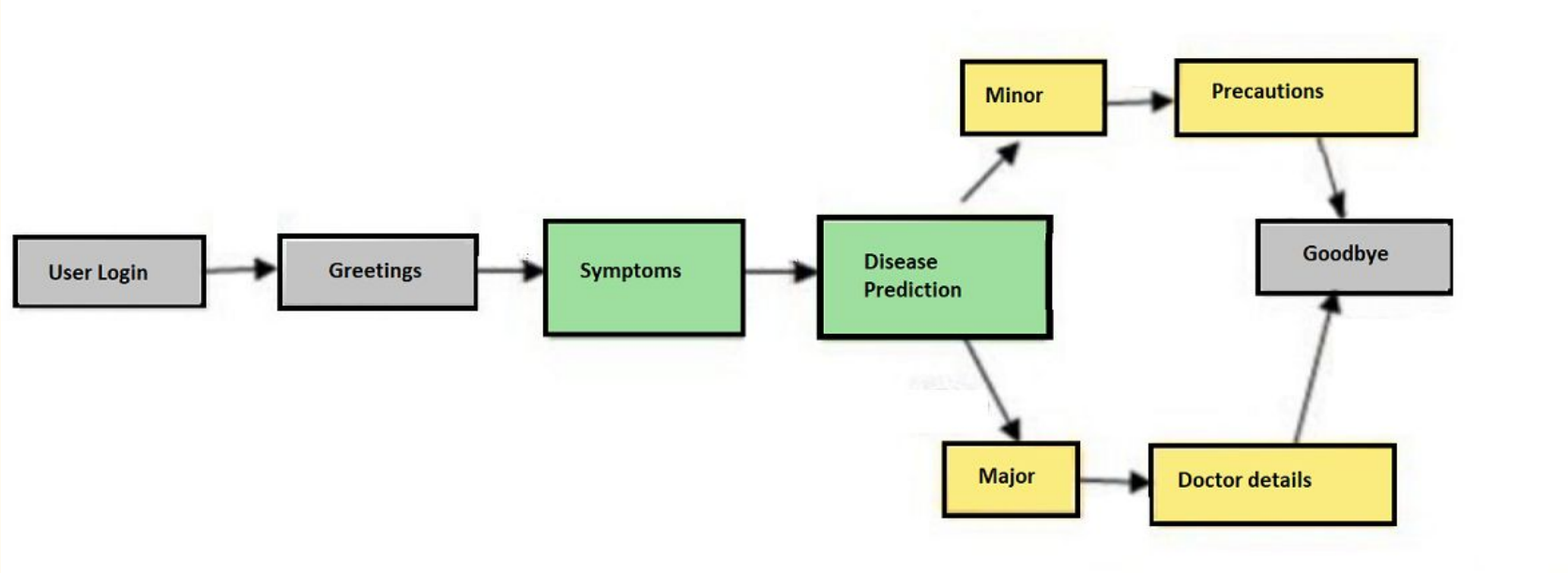
- Dialogflow
  - Dialogflow is a Google-owned framework that enables users to develop human-computer interaction technologies that can support Natural Language Processing (NLP).
- Flask
  - Flask is a micro web framework written in Python.
- MySQL
  - MySQL is an open-source relational database management system.

LITERATURE SURVEY

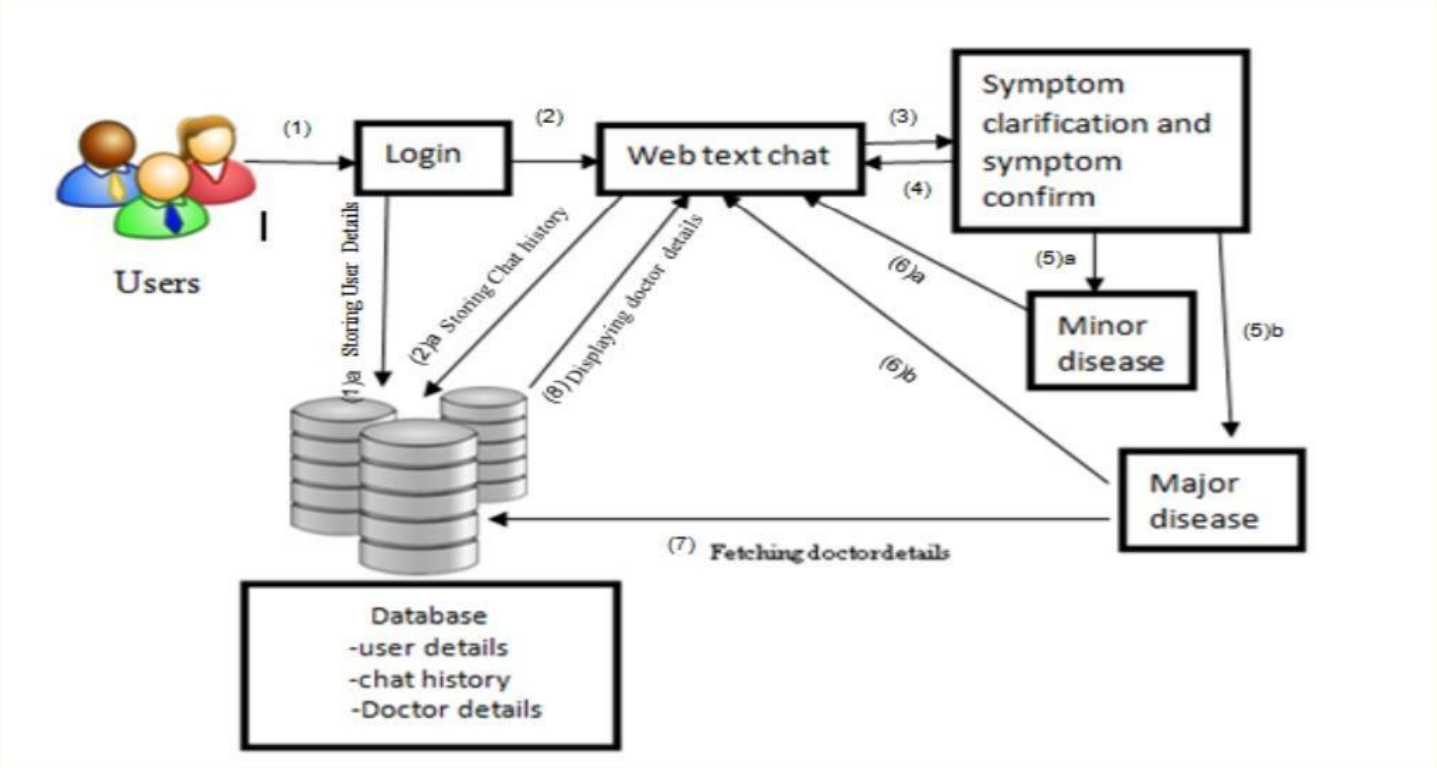
- SURVEY PAPER-1: "**A Self-Diagnosis Medical Chatbot Using Artificial Intelligence**", Divya S, Indumathi V, Ishwarya S, Priyasankari M, Kalpana Devi S

  DESCRIPTION: In this system the user dialogue is a linear design that proceeds from symptom extraction, to symptom mapping, where it identifies the corresponding symptom, then diagnosis the patient whether it's a major or minor disease.

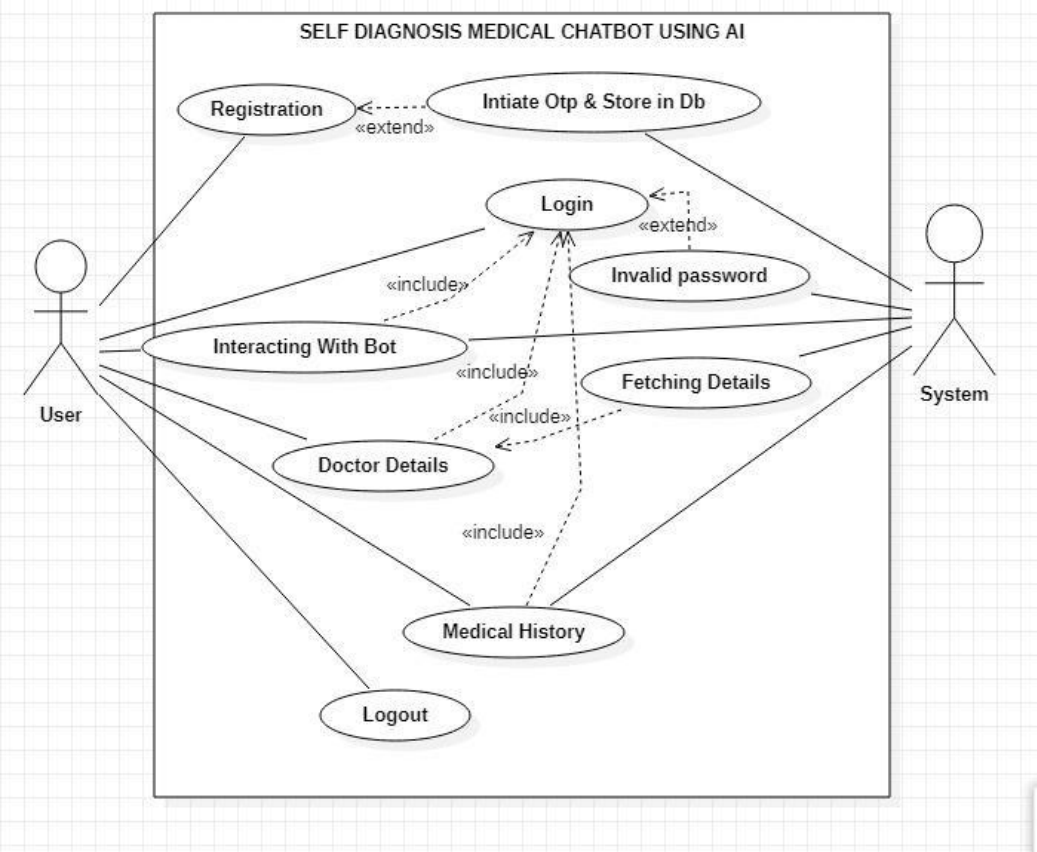
SYSTEM DESIGN



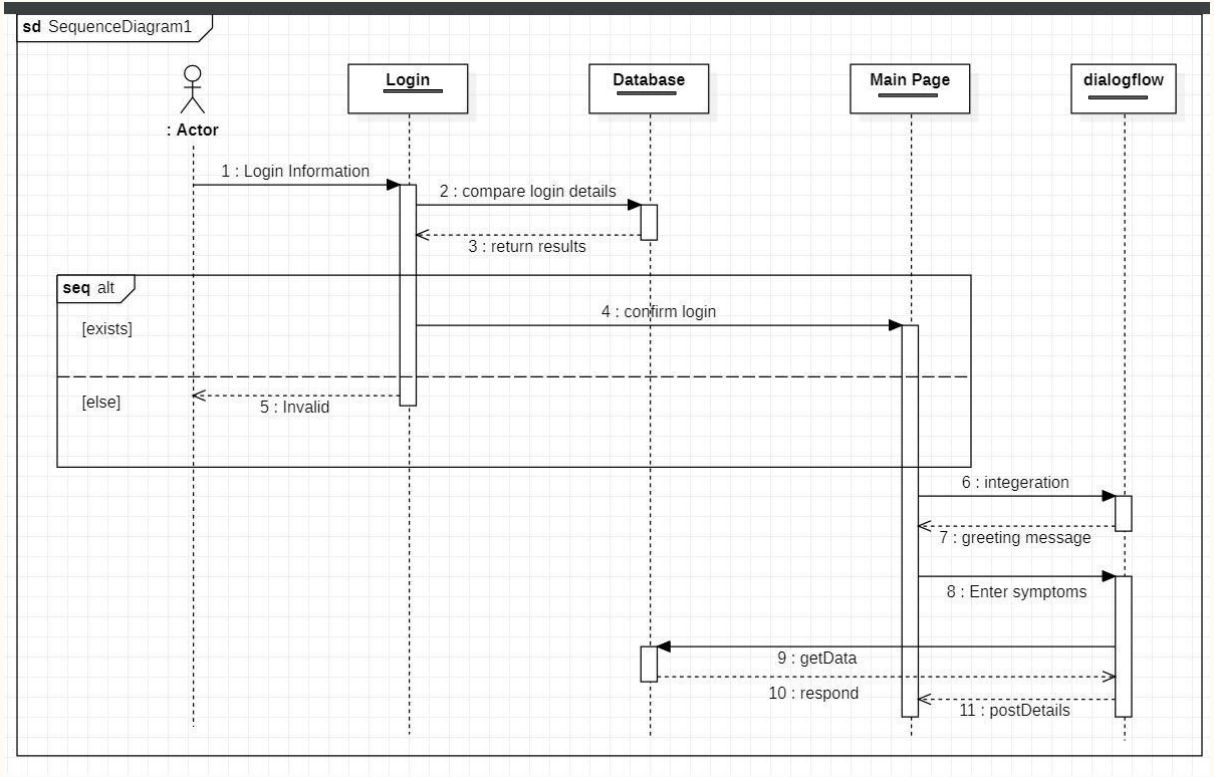
Finite State Graph



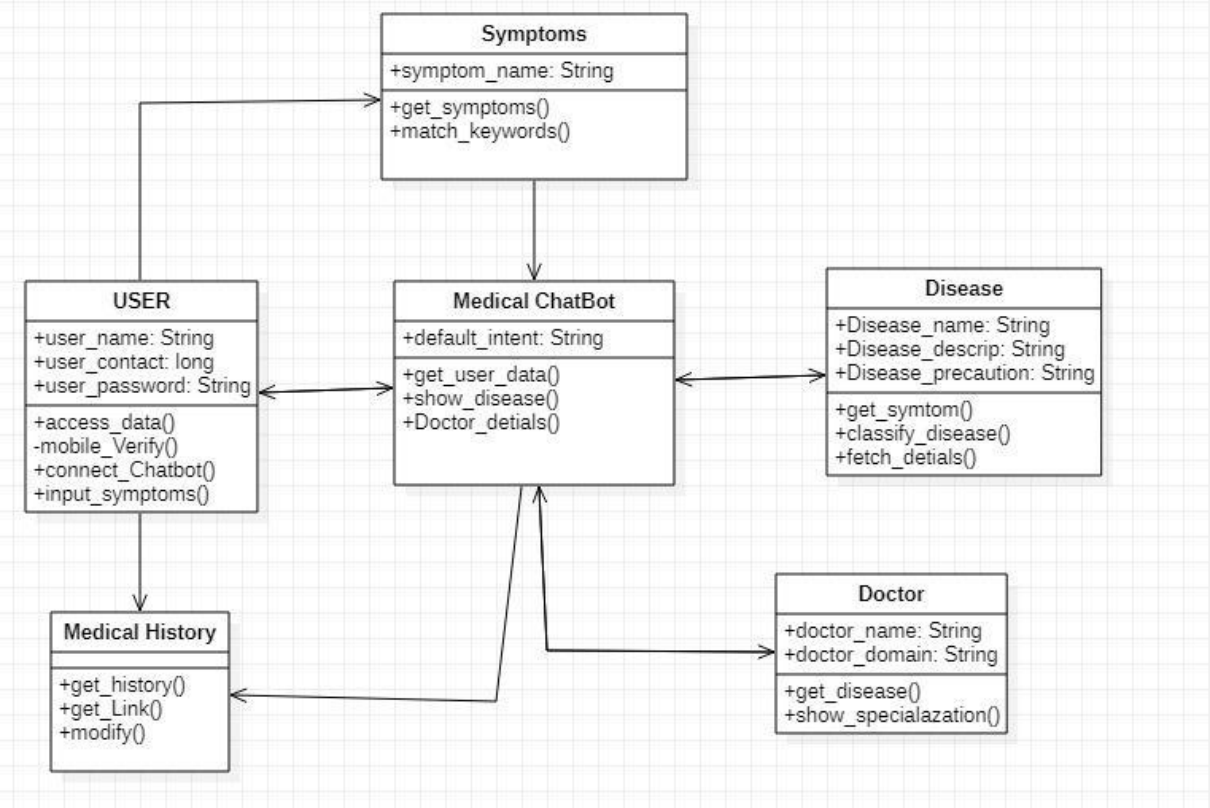
Functional Architecture



Use Case diagram



Sequence diagram



Class diagram

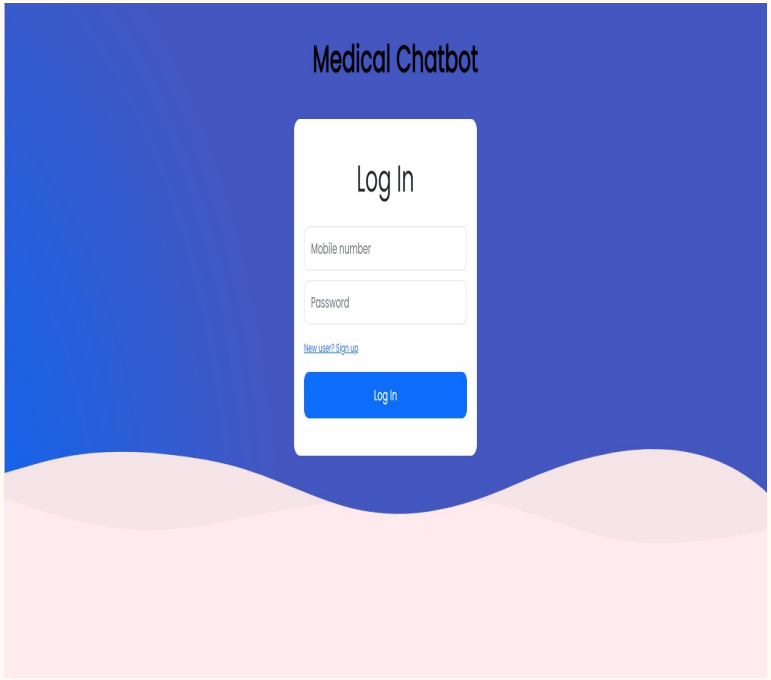
IMPLEMENTATION

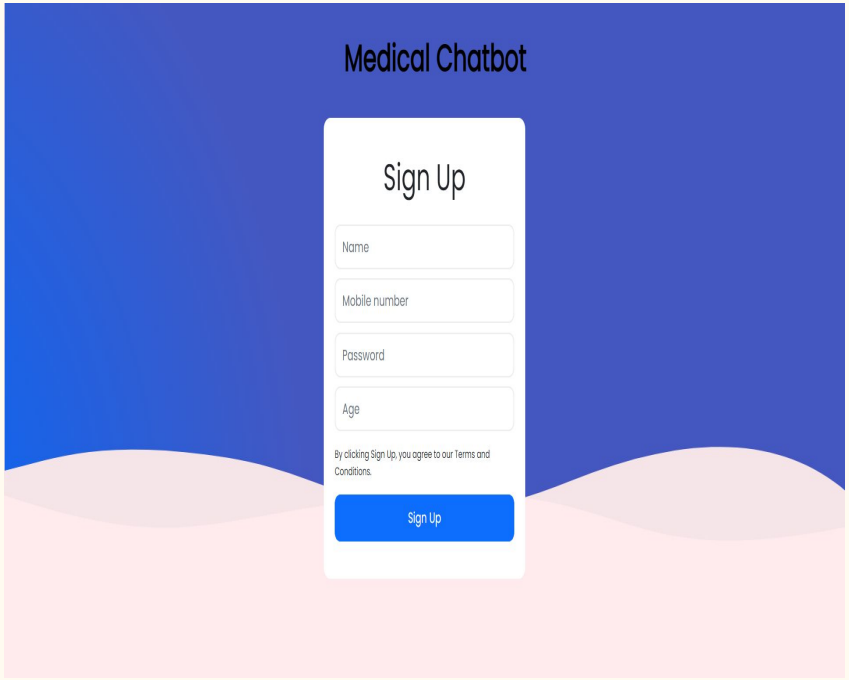
```
import tensorflow as tf
import pandas as pd
import numpy as np
data = pd.read_csv("Training.csv")
x = data.drop(["prognosis"], axis = 1).to_numpy()
y_data = data.loc[:, "prognosis"]
labels = y_data.drop_duplicates().to_list()
y = []
for i in y_data:
    y.append(labels.index(i))
y = np.array(y)
model = tf.keras.Sequential([
    tf.keras.layers.Dense(32, activation='relu'),
    tf.keras.layers.Dense(38)
])
model.compile(optimizer='adam',
              loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
              metrics=['accuracy'])
model.fit(x, y, epochs=5, verbose = 2, validation_split=0.3)
model.save('my_model.h5')
```

```
model = tf.keras.models.load_model('my_model.h5')
probability_model = tf.keras.Sequential([model, tf.keras.layers.Softmax()])
x_input = np.array([x_input])
y_input = probability_model.predict(x_input)
predicted_disease = labels[np.argmax(y_input[0])]
```

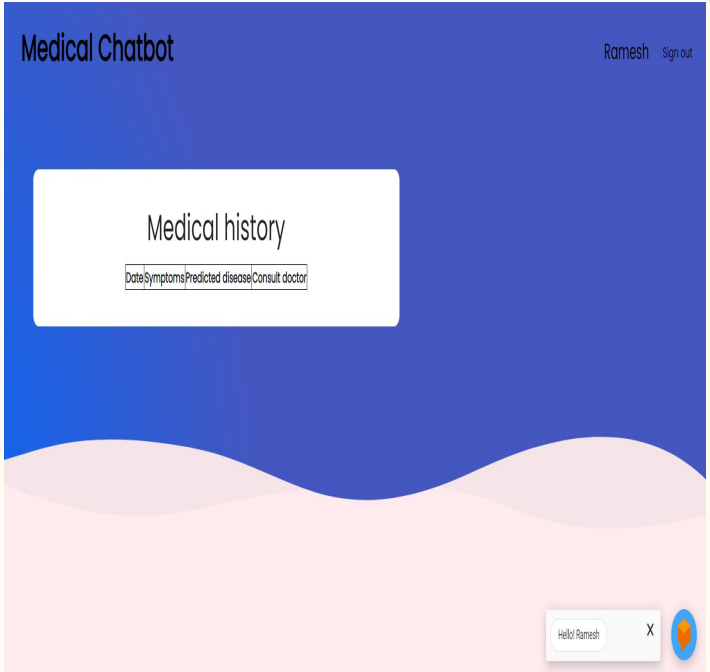
```
cur=mysql.connection.cursor()
cur.execute("select * from medicalhistory where mobilenumber = %s;", [mobilenumber])
medicalhistory = list(cur.fetchall())
mysql.connection.commit()
cur.close()
```

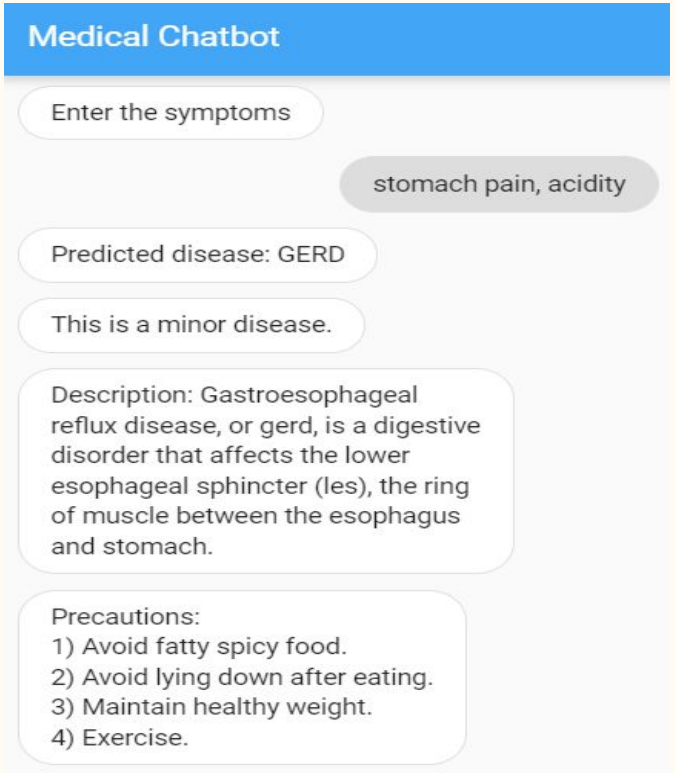
```
@app.route('/dialogflow', methods=['POST'])
def dialogflow():
    req = request.get_json(silent=True, force=True)
    fulfillmentText = ''
    query_result = req.get('queryResult')
    if query_result.get('action') == 'input.welcome':
        return { "fulfillmentMessages": [
                {
                "text": {
                    "text": [
                        "Hello! " + user_name
                    ]
                    }
                },
                {
                "text": {
                    "text": [
                        "How can I help you?"
                    ]
                    }
                }]}
    elif query_result.get('action') == 'Symptom':
        return {"fulfillmentText": 'Enter the symptoms'}
    elif query_result.get('action') == 'Symptom.Symptom-custom':
        symptom = query_result.get('parameters').get('symptoms').split(",")
        output = Promise(lambda resolve, reject: resolve(predict(symptom)))
        if output.get() == "Invalid symptoms":
            return {"fulfillmentText": "Not able to predict, kindly consult doctor.\nThank you!"}
        else:
            description = "Description: "
            for i in output.get().split("+")[3].split("?"):
                description += i
            j = 1
            precaution = "Precautions:\n"
            for i in output.get().split("+")[4].split("?"):
                precaution += str(j) + ") " + i + ".\n"
                j += 1
            return { "fulfillmentMessages": [
                {
                "text": {
                    "text": [
                        "Predicted disease: " + output.get().split("+")[0]
```

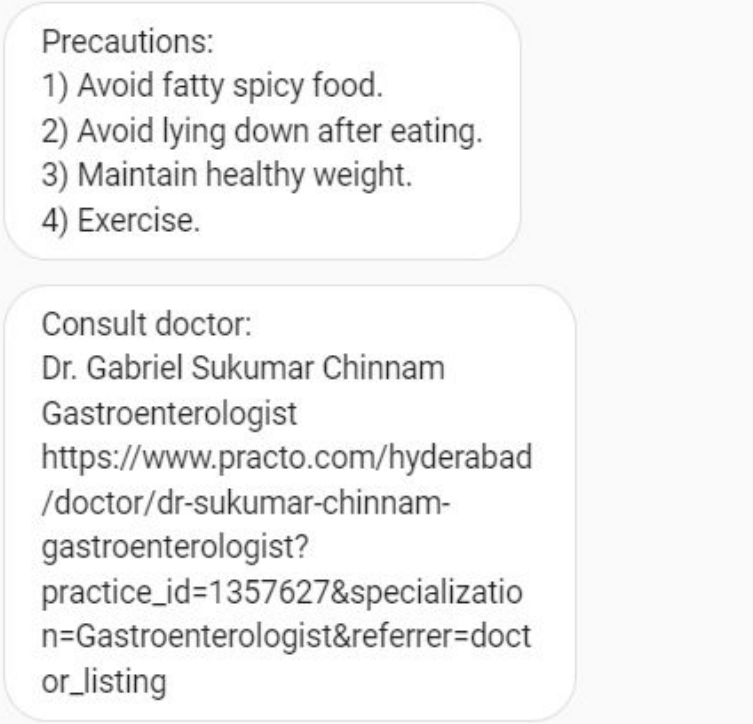

Medical Chatbot
Log In
Mobile number
Password
New user? Sign up
Log In

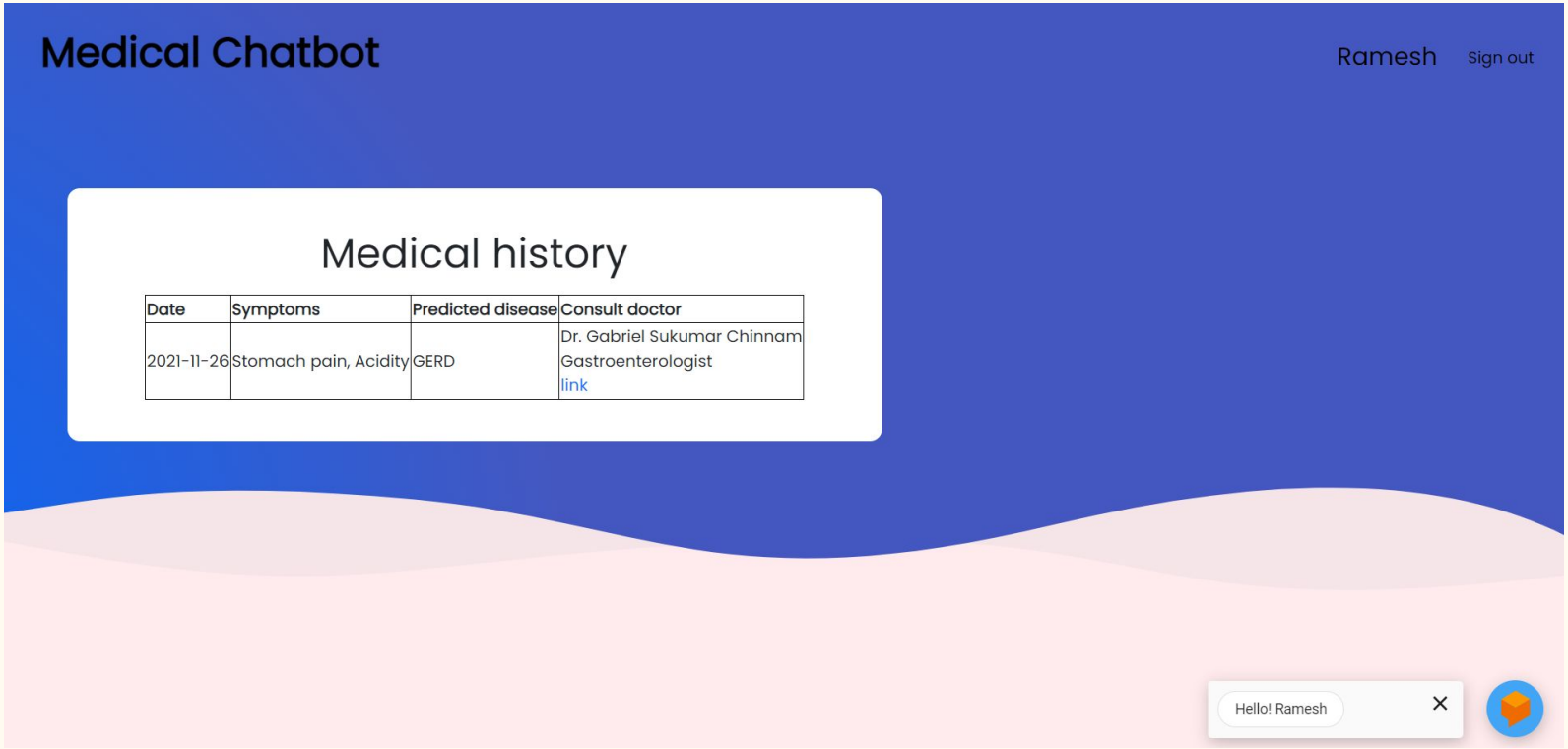

Medical Chatbot
Sign Up
Name
Mobile number
Password
Age
By clicking Sign Up, you agree to our Terms and Conditions.
Sign Up


Medical Chatbot
Mobile number verification
Enter the code sent to the mobile number
Submit


Medical Chatbot
Ramesh
Sign out
Medical history
Date
Symptoms
Predicted disease
Consult doctor
Hello! Ramesh
X


Medical Chatbot
Enter the symptoms
stomach pain, acidity
Predicted disease: GERD
This is a minor disease.
Description: Gastroesophageal reflux disease, or gerd, is a digestive disorder that affects the lower esophageal sphincter (les), the ring of muscle between the esophagus and stomach.
Precautions:
1) Avoid fatty spicy food.
2) Avoid lying down after eating.
3) Maintain healthy weight.
4) Exercise.


Precautions:
1) Avoid fatty spicy food.
2) Avoid lying down after eating.
3) Maintain healthy weight.
4) Exercise.
Consult doctor:
Dr. Gabriel Sukumar Chinnam
Gastroenterologist
https://www.practo.com/hyderabad/doctor/dr-sukumar-chinnam-gastroenterologist?practice_id=1357627&specialization=Gastroenterologist&referrer=doctor_listing


Medical Chatbot
Ramesh
Sign out
Medical history
Date
Symptoms
Predicted disease
Consult doctor
2021-11-26
Stomach pain, Acidity
GERD
Dr. Gabriel Sukumar Chinnam
Gastroenterologist
link
Hello! Ramesh

TEST CASES

Test Scenario ID	Login Page	Test Case ID	Login Page-1A
Test Case Description	Launching Login Page	Test Priority	High
Prerequisite	NA	Post Requisite	NA

Test Execution Steps:

S.No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comments
1	Localhost: 8080	URL: http://localhost:8080	Launch Login page	Login page launched	Chrome	Pass	NA

Table 6.3.1: Launching Login Page

Test Scenario ID	Registration	Test Case ID	Register-1A
Test Case Description	Register Form	Test Priority	High
Prerequisite	Mobile no	Post Requisite	NA

Test Execution Steps:

S.No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Results	Test Comments
1	http://localhost:8080/register	Saketh 9104005345 ***** 20	Registered Successfully	Registered Successfully	Chrome	Pass	NA
2	http://localhost:8080/register	Chandu 9381605392 ***** 20	Registered Successfully	Registered Successfully	Chrome	Pass	NA

Table 6.3.2: Register Form

Test Scenario ID	Login	Test Case ID	Login-1A
Test Case Description	Login Positive Test Case	Test Priority	High
Pre-Requisite	Valid User Account	Post Requisite	NA
Test Execution Steps:			

S.No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test Comments
1	http://localhost:8080	9104005345 *****	User Dashboard	User Dashboard	Chrome	Pass	NA
2	https://localhost:8080	9381605392 *****	User Dashboard	User Dashboard	Chrome	Pass	NA

Table 6.3.3: Login Positive Test Case

Test Scenario ID	Login	Test Case ID	Login-2A
Test Case Description	Login Negative Test Case	Test Priority	High
Pre-Requisite	Valid User Account	Post Requisite	NA
Test Execution Steps:			

S.No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test Comments
1	http://localhost:8080	9104005345 *****	Login Failed	Login Failed	Chrome	Pass	NA
2	http://localhost:8080	9381605392 *****	Login Failed	Login Failed	Chrome	Pass	NA

Table 6.3.4: Login Negative Test Case

Test Scenario ID		Medical History		Test Case ID		Medical 1-A	
Test Case Description		User Medical History		Test Priority		High	
Pre-Requisite		NA		Post Requisite		NA	
Test Execution Steps:							
S.No	**Action**	**Inputs**	**Expected Output**	**Actual Output**	**Test Browser**	**Test Result**	**Test Comments**
1	https://localhost:8080/login	Stomach pain, Acidity	Medical Data Updated	Medical Data Updated	Chrome	Disease Predicted	NA
2	https://localhost:8080/login	123	No Records	No Records	Chrome	No Predicted Disease	NA

Table 6.3.5: User Medical History

CONCLUSION

- The usage of chatbot is user friendly and can be used by any person who knows how to type in mobile app or desktop version.
- The medical chatbot provides personalized diagnoses based on symptoms.
- The implementation of medical chatbot heavily relies on Artificial Intelligence algorithms as well as the training data.
- No matter how far people are, they can have this medical conversation. The only requirement they need is a simple desktop or smartphone with internet connection.

REFERENCES

- https://cloud.google.com/dialogflow/docs
- https://flask.palletsprojects.com/en/2.0.x/
- Divya S, Indumathi V, Ishwarya S, Priyasankari M, Kalpana Devi S, **“A Self-Diagnosis Medical Chatbot Using Artificial Intelligence”**

THANK YOU