

HEALTH CLINIC BOT

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INTRODUCTION

Having quick and reliable access to information on medical facilities is essential in the healthcare sector. The goal of this project is to create an intuitive system that will enable users to search for and obtain data on healthcare facilities according to their location and facility type. In the current project, a web application built with Flask has been created to give users access to healthcare facility information. To manage user interactions and retrieve data from a preprocessed healthcare dataset, the application makes use of a ChatBot class. Additionally, it will provide important information like insurance acceptance, convenient hours, and emergency service availability. Our mission is to empower clients with the knowledge they need to make wise healthcare decisions. Our main goal is to empower our customers by making essential healthcare information more accessible to all. Beyond just giving people information, our mission encompasses our dedication to empowering people and giving them the knowledge they need to successfully navigate and make decisions in the complex world of healthcare services. One potential path forward for ongoing improvement and development is the incorporation of Language Model-based Learning (LLM) systems. Our ChatBot's capability can be enhanced beyond what it is now capable of by utilizing sophisticated language models, such as those driven by machine learning and natural language processing (NLP).

RELATED WORK

Many studies have focused on data integrity, privacy, and effective storage while discussing healthcare data management systems. Databases used by these systems frequently hold patient data, hospital information, and medical histories. A few initiatives have investigated how users can interface with healthcare systems to retrieve information. Web applications and chatbots have been created to help consumers locate healthcare facilities according to their location, the services they need, or their own preferences. Unfortunately, the majority of these systems are only applicable to one hospital or a small number of hospitals, which limits their reach. Our chatbot-driven application interacts with a complete dataset, enabling users to access information across different hospitals and facility types, in contrast to many other existing systems that concentrate on a single hospital or a restricted dataset. Our bot's adaptability is one of its unique features. In contrast to bots that are exclusive to a single hospital, our application compiles data from a variety of healthcare institutions. When consumers seek healthcare providers, this inclusivity gives them access to a wider range of options and information, improving their ability to make choices.

METHODOLOGY

1. Flask App Initialization

Purpose: The goal of the Flask framework is to create an instance of the Flask class and initialize the web application.

CORS Integration: To enable communication with the application from many domains, CORS (Cross-Origin Resource Sharing) is used. The server can reply to cross-origin requests if CORS is enabled.

2. ChatBot Class

Role: The application's ChatBot class serves as the foundation for all user interactions.

Functionality:

- Message Handling: To collect preferences and handle requests, the class methods handle user input by directing users through a conversational flow.
- Dataset Interaction: Based on input supplied by the user, the ChatBot queries and retrieves data from the healthcare dataset.
- Response Generation: Based on user input, it presents appropriate healthcare facility details in response to user communications.

3. Data Loading and Processing

Dataset Source: An Excel file serves as the original source of the data.

Steps in Preprocessing: The dataset is loaded into a Pandas DataFrame during the loading process.

Managing Missing Values: Fillna() and other techniques may be used to identify and handle missing values in the dataset.

Character Standardization: To maintain uniform formatting, special characters are replaced, such as apostrophes.

Data Consistency: Inconsistencies in formatting (such as trailing or preceding spaces) are corrected to provide consistency.

Storage: To provide easy retrieval and use within the program, the cleaned dataset is stored as a CSV file.

4. Flask Pathways

URL Routing: In an application, routes are set up to control various user interactions.

Functionality:

Root URL ('/'): This renders 'index.html', which is the user interface's entrance point.

'/map': Shows a map display, possibly with customization options for the user.

'/submit message': Responds to messages from users and forwards them to the ChatBot for analysis.

'/get data': Based on user input, retrieves essential medical data.

5. HTML Templates

Interface Design: 'map.html' and 'index.html' are examples of HTML templates designed to provide an easy-to-use interface.

Goal:

"index.html": Offers a place for users to engage, probably with input forms for preferences.

"map.html": Based on user requests, this page shows information on healthcare facilities, possibly on a map interface.

RESULTS AND DISCUSSION

Data Preprocessing

The initial step involved processing raw healthcare data. Python and Pandas were used to convert, clean, and arrange the raw Excel data into a more readable CSV file. This included addressing missing values, standardizing column names, and ensuring data consistency.

Pre-Processed Dataset:

https://www.dropbox.com/scl/fi/b9oend7t9ui5dl1pvkre9/clean_healthCare_data.csv?rlkey=00cy6nq521dr98a4mxpg50da7&dl=0

Hospital Name	Hospital Type	Address	City	State	Postal Code	Email	Contact	Rating	Doctor's Name	Facility Type	Insurance	Emergency Service	Opening Hours	Latitude	Longitude	Web site URL
Premier Hospital	Hospital	12-2-718, Khader Bagh Rd, Padmanabha Nagar Hyderabad	Telangana	500008	918374718100	helpdesk@premierhospital.in	4.3	Dr. Mahesh Mard	General Physician	Yes	Yes	24 hours	17.39158	78.4269972	https://premierhospital.in/	
Mythri Hospital	Hospital	Opp Pillar No. 81, PVR Expressway, Inner Ring Rd, Venkateswara Nagar, Hyderabad	Telangana	500008	info@mythrihospital.net	914023516326	4.7	Dr. Mohd Afnas	General Physician	Yes	Yes	24 hours	17.38433	78.4290784	https://mythrihospital.net/doctors	
Olive Hospital	Hospital	Building No. 12-2-718/3/A5, Nanahagar X Rd, Hyderabad	Telangana	500028	info@olivehospitals.com	9196669050392	4.4	Dr. MD ABDUL M	General Physician	No	Yes	24 hours	17.39372	78.427083	https://www.olivehospitals.com/specilities/vie	
Sameer Hospital	Hospital	12, Asif Nagar Rd, Sri Ram Nagar Colony, MEC Hyderabad	Telangana	500028	info@sameerhospitals.in	040 2533-2829	3.4	Dr. Mansoor	General Physician	No	Yes	24 hours	17.39341	78.4445782	https://sameerhospitals.in/	
Salamah Hospital	Hospital	13-6-436/5/A/1, near Masjid-e-Quba, Rock Rd, Hyderabad	Telangana	500008	info@salamahhospital.in	9179813 75626	3.2	Dr. Asma Ghose	General Physician	No	No	24 hours	17.39231	78.4255511	https://salamahhospital.in/our-team/	
Himagiri Hospitals	Hospital	plot no. 4,5,23 & 24, Old Mumbai Hwy, Indra Hyderabad	Telangana	500032	info@himaghospitals.com	9180080505564	4.2	Dr. Sri Sai Niya	General Physician	Yes	Yes	24 hours	17.42454	78.586578	https://www.himaghospitals.com/	
AIG Hospitals	Hospital	1-66/AIG/2 or 5, Mindspace Rd, P Janardhan, Hyderabad	Telangana	500032	info@aighospitals.com	9140 4244 4222	4.4	Dr. Apoorva Munj	General Physician	Yes	Yes	24 hours	17.44331	78.3651444	https://aighospitals.com/	
Medic HealthCare	Clinic	Survey No. 55/F, Nanakramguda Circle Nana Hyderabad	Telangana	500032	hello@rahulchirag.com	918977037262	3.1	Dr. Rahul Chirag	General Physician	No	No	5PM to BPM	17.42005	78.3541901	https://www.dralrahulchirag.com/	
Goutam MultiSpeciality Hospital	Hospital	116, Lumbini Enclave, Hitech City Main Rd, Hyderabad	Telangana	500081	info@goutameurocare.com	919885141699	4.9	Dr. Neeraj	General Physician	Yes	Yes	24 hours	17.43366	78.3743759	https://goutameurocare.com/	
Arete Hospitals	Hospital	opposite biodiversity park, Madhura Nagar C Hyderabad	Telangana	500081	info@aretehospitals.com	919406969 6965	4.8	Dr. Anand Sagari	General Physician	No	Yes	24 hours	17.42802	78.3750008	https://www.aretehospitals.com/	
Omega Hospitals	Hospital	CHI Lane, Rd Number 1, Seven Hills Colony, C Hyderabad	Telangana	500032	info@omegahospitals.com	919848011421	3.8	Dr. Samragyi Vasi	General Physician	Yes	Yes	24 hours	17.36669	78.3674246	https://www.omegahospitals.com/	
Continental Hospitals	Hospital	Plot No. 3, Road No. 2, Financial District, Gachibowli	Telangana	500032	queries@continentalhospitals.com	917799360360	4.6	Dr Shilpa Aralikar	General Physician	Yes	Yes	24 hours	17.41771	78.3395223	https://continentalhospitals.com/	
CARE Hospitals	Hospital	Old Mumbai Hwy, near Cyberabad Police Co. Hyderabad	Telangana	500032	info@carehospitals.org	914068106585	4.5	Dr. Raha Agrawal	General Physician	Yes	Yes	24 hours	17.43066	78.3722685	https://www.carehospitals.com/	
Apollo Clinic	Clinic	Kothaguda, X Roads, Beside Swaghto De-Roya, Hyderabad	Telangana	500038	info@apolloclinic.com	18605007788	4.6	Dr. Vivek Belde	General Physician	No	No	7AM to 9PM	17.46006	78.3650007	https://www.apoloclinic.com/	
Satyasree Clinics & Diagnic Clinic	Clinic	Botanical Garden Road, (Beside Chirec School) Hyderabad	Telangana	500084	satyasreehospital@gmail.com	919515344388	4.2	Dr Sridhar Y	General Physician	No	Yes	7AM to 10PM	17.46261	78.3508336	https://satyasreeclinics.com/	
Nikhil Hospitals	Hospital	Gaddi Annaram Cross Road, Dilukh Nagar M Hyderabad	Telangana	500036	cont@nikhilhospitals.com	040 7124 1111	4.3	Dr. Likhita Dasari	General Physician	Yes	Yes	24 hours	17.36834	78.203462	https://nikhilhospitals.com/	
Sreshtha Sri Kamala Hospital	Hospital	11-11-739/1&2, NH 65, Dilukh Nagar, Hyderabad	Telangana	500060	greshtha@sriskamalahospitals.com	9180908901188	3.4	Dr. V Vamsi	General Physician	No	Yes	24 hours	17.36861	78.522021	https://sreshthasrikamalahospitals.in/index.php	
Dr MV Rao	Hospital	2nd Floor, Yasoda Hospital, Room No. 238, Rd, Hyderabad	Telangana	500082	drdmvrao16@gmail.com	919906600004	4.9	Dr M V Rao	General Physician	No	No	10AM to 4PM	17.42463	78.4569204	https://drmvrao.com/	
Metro City Hospital	Hospital	2-2-18, Nagole - Bandlaguda Rd, road no. 8, Rd Hyderabad	Telangana	500068	metrocityhospital.org@gmail.com	918892808182	4.5	Dr. Vasantha	General Physician	No	No	24 hours	17.37407	78.5629209	https://www.metrocityhospital.org/index.html	
Vasav Hospital	Hospital	branch Asha laxmi, H.No: 13-11-1161, Ram I Hyderabad	Telangana	500035	info@vasavhospital.net	918686969640	4.4	Dr. Vasantha J	General Physician	No	No	24 hours	17.36361	78.451002	https://www.vasavhospitl.org/index.html	
SLG Hospitals	Hospital	SLG Circle, Krishnaji Hills, Nizampet Hyderabad	Telangana	500090	INFO@SLGHOSPITALS.COM	917799235678	4.2	Dr. A Santhosh Kumar	General Physician	No	Yes	24 hours	17.35863	78.3672735	https://slghospitals.com/	
Pranathithi Hospitals	Hospital	H.No-13-13/10/H Hanuman Nagar, Pillar No. 4, Hyderabad	Telangana	500036	info@pranathithihospitals.com	918008801192	4.8	Dr. Vinay Kumar	General Physician	No	Yes	24 hours	17.36951	78.5303523	https://www.pranathithihospitals.com/	
KIMS Hospitals	Hospital	Begumpet, 1-8-37/1, Minister Rd, Krishna Rd, Hyderabad	Telangana	500003	040 44885000	4.5	Dr. Shiva Raju	General Physician	Yes	Yes	24 hours	17.43674	78.4825293	https://www.kims hospitals.com/		
Dr. Fin's Clinic	Clinic	Plot no. 498, Shoo S. Roia Raia Maslam, Golk, Hyderabad	Telangana	500085	contact@drfiny.in	919885000720	4.8	Dr. Fini Philip	General Physician	No	No	10AM to 9PM	17.48902	78.380683	https://www.drfiny.in/	

Fig a. Raw Data

hospital_name	hospital_type	address	city	state	postal_code	Email	Contact	Rating	doctor_name	facility_type	insurance	emergency_service	opening_hours	Latitude	Longitude	website_u
Premier Hospital	Hospital	12-2-718, Khader Bagh Rd, Padmanabha Nagar, Tel Cheek	Telangana	500008	helpdesk@premierhospital.in	918374718100	4.3	Dr. Manohar Mard	General Physician	Yes	Yes	24 hours	17.39158	78.4269972	https://premierhospital.in/	
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Sameer Hospital	Hospital	12, Asif Nagar Rd, Sri Ram Nagar Colony, MEC Hyderabad	Telangana	500028	info@sameerhospitals.in	040 2533-2829	3.4	Dr. Mansoor	General Physician	No	Yes	24 hours	17.39341	78.4445782	https://sameerhospitals.in/	
Salamah Hospital	Hospital	13-6-436/5/A/1, near Masjid-e-Quba, Rock Rd, Hyderabad	Telangana	500008	info@salamahhospital.in	9179813 75626	3.2	Dr. Asma Ghose	General Physician	No	No	24 hours	17.39231	78.4255511	https://salamahhospital.in/our-team/	
Himagiri Hospitals	Hospital	plot no. 4,5,2 & 6, Rd, Old Mumbai Hwy, Indra Hyderabad	Telangana	500032	info@himaghospitals.com	9180080505564	4.2	Dr. Sri Sai Niya	General Physician	Yes	Yes	24 hours	17.42454	78.586578	https://www.himaghospitals.com/	
AIG Hospitals	Hospital	1-66/AIG/2 or 5, Mindspace Rd, P Janardhan, Hyderabad	Telangana	500032	info@aighospitals.com	9140 4244 4222	4.4	Dr. Apoorva Munj	General Physician	Yes	Yes	24 hours	17.44331	78.3651444	https://aighospitals.com/	
Medic HealthCare	Clinic	Survey No. 55/F, Nanakramguda Circle Nana Hyderabad	Telangana	500032	hello@rahulchirag.com	918977037262	3.1	Dr. Rahul Chirag	General Physician	No	No	5PM to BPM	17.42005	78.3541901	https://www.dralrahulchirag.com/	
Goutam MultiSpeciality Hospital	Hospital	116, Lumbini Enclave, Hitech City Main Rd, Hyderabad	Telangana	500081	info@goutameurocare.com	919885141699	4.9	Dr. Neeraj	General Physician	Yes	Yes	24 hours	17.43366	78.3743759	https://goutameurocare.com/	
Arete Hospitals	Hospital	opposite biodiversity park, Madhura Nagar C Hyderabad	Telangana	500081	info@aretehospitals.com	919406969 6965	4.8	Dr. Anand Sagari	General Physician	No	Yes	24 hours	17.42802	78.3750008	https://www.aretehospitals.com/	
Omega Hospitals	Hospital	CHI Lane, Rd Number 1, Seven Hills Colony, Hyderabad	Telangana	500032	info@omegahospitals.com	919848011421	3.8	Dr. Samragyi Vasi	General Physician	Yes	Yes	24 hours	17.36669	78.3672426	https://www.omegahospitals.com/	
Continental Hospitals	Hospital	Plot No. 3, Road No. 2, Financial District, Gachibowli	Telangana	500032	queries@continentalhospitals.com	917799360360	4.6	Dr Shilpa Aralikar	General Physician	No	No	24 hours	17.41771	78.3395223	https://continentalhospitals.com/	
CARE Hospitals	Hospital	Old Mumbai Hwy, near Cyberabad Police Commissionerate, Jagadish Puram, HITEC City	Telangana	500060	info@carehospitals.org	914068106585	4.5	Dr. Venkatesh Reddy	General Physician	Yes	Yes	24 hours	17.43066	78.4445782	https://www.carehospitals.org/	
Apollo Clinic	Clinic	Kothaguda, X Roads, Beside Swaghto De-Roya Restaurants	Telangana	500038	info@apolloclinic.com	18605007788	4.4	Dr. Apoorva Moulgi	General Physician	Yes	Yes	24 hours	17.44244	78.3650007	https://www.apolloclinic.com/	
Sathyasree Clinics & Diagnic Clinic	Clinic	Botanical Garden Road, (Beside Chirec School) Kondapur	Telangana	500044	info@sathyasree@gmail.com	919515344388	3.1	Dr. Rakesh Chirag	General Physician	No	No	5PM to BPM	17.43366	78.3549404	https://sathyasreeclinics.com/	
Nikhil Hospitals	Hospital	Gaddi Annaram Cross Road, Dilukh Nagar Main Rd, Dilukh Nagar	Telangana	500036	cont@nikhilhospitals.com	040 7124 1111	4.3	Dr. Arunima Gousar	General Physician	No	No	24 hours	17.36812	78.3650021	https://nikhilhospitals.com/	
Omragi Hospitals	Hospital	plot no. 4,5,2 & 6, Rd, Old Mumbai Hwy, Gachibowli	Telangana	500032	info@omragihospitals.com	919885000724	4.2	Dr. Sri Sai Niya	General Physician	Yes	Yes	24 hours	17.43552	78.4445404	https://www.omragihospitals.com/	
MGH Hospital	Hospital	1-4-14/2/1 to 1, Mindspace Rd, Kondapur	Telangana	500032	info@mhospital.com	9140 4244 4222	4.4	Dr. Aparna Vaidya	General Physician	Yes	Yes	24 hours	17.44211	78.3671749	https://mg-hospital.com/	
Medis HealthCare	Clinic	Ground No. 10, Narayana Hrudayalaya, Gachibowli	Telangana	500032	info@medishealthcare.com	919885000720	4.0	Dr. Parash Agarwal	General Physician	Yes	Yes	24 hours	17.43056	78.3529561	https://www.medishealthcare.com/	
SARE Hospitals	Hospital	Old Martti Hwy, near Cyberabad Police Commissionerate, Jagadish Puram, HITEC City	Telangana	500060	NA	914068106585	4.5	Dr. Parkh Agarwal	General Physician	Yes	Yes	24 hours	17.43056	78.3529562	https://www.sarehospitals.com/	
Apollo Clinic	Clinic	Kothaguda, X Roads, Beside Swaghto De-Roya Restaurants	Telangana	500038	info@apolloclinic.com	18605007788	4.4	Dr. Vivek Datta	General Physician	No	No	7AM to 10PM	17.43366	78.3549404	https://www.apolloclinic.com/	
Sathyasree Clinics & Diagnic Clinic	Clinic	Botanical Garden Road, (Beside Chirec School) Kondapur	Telangana	500044	info@sathyasree@gmail.com	919515344388	3.0	Dr. Vaishali Vasi	General Physician	No	No	7AM to 10PM	17.43066	78.3549404	https://sathyasreeclinics.com/	
Kidh Hospitals	Hospital	Gaddi Annaram Cross Road, Dilukh Nagar Main Rd, Dilukh Nagar	Telangana	500036	cont@kidhhospitals.com	040 7124 1111	4.3	Dr. Lakshmi Dasari	General Physician	Yes	Yes	24 hours	17.36812	78.3650021	https://kidhhospitals.com/	
Amrita Sri Keralai Hospital	Hospital	11-11-739/1, NH 65, Dilukh Nagar	Telangana	500036	amritasrikeralai@gmail.com	918008011801	3.4	Dr. V Venki	General Physician	No	Yes	24 hours	17.36811	78.3650008	https://amritasrikeralai.com/	
Sr MV Rao	Hospital	2nd floor, Venkata Hospital, Room No. 208, Raj Bhawan Rd, Somajiguda	Telangana	500040	drmvrao16@gmail.com	919885000726	4.0	Dr. M V Rao	General Physician	No	No	10AM to 4PM	17.41412	78.4174767	https://drmvrao16@gmail.com/	
Metro City Hospital	Hospital	1-2-18, Nagole - Bandlaguda Rd, Beside Swaghto De-Roya Restaurants	Telangana	500032	info@metrocithy.com	919885000720	3.0	Dr. Venkatesh Reddy	General Physician	No	No	24 hours	17.37497	78.3670014	https://www.metrocityhospital.org/	
Avani Hospital	Hospital	Branch Astra Ianti, HNo: 13-11-161, Part Prasad-nagar Gaddi Nagar, Gaddi Nagar hitec city colony, Temple Rd, Kondapur	Telangana	500036	info@avanihospital.com	918008011802	4.0	Dr. Venkata J	General Physician	No	Yes	24 hours	17.36804	78.3650004	https://www.avanihospital.com/	
Kidz Hospital	Hospital	SLG Circle, Krishnaji Hills, Nizampet	Telangana	500032	info@kidzhospital.com	919885000720	4.2	Dr. Ganesh Kumar	General Physician	No	Yes	24 hours	17.36803	78.3650004	https://www.kidzhospital.com/	
Paramatha Hospitals	Hospital	H.no-13-109 Hanuman Nagar, Pillar No. A 155, Charanayapatna, Chikmagalur	Telangana	500036	info@paramathahospitals.com	919885000720	4.0	Dr. Vinay Kumar	General Physician	No	Yes	24 hours	17.36611	78.3670277	https://www.paramathahospitals.com/	
QMD Hospitals	Hospital	Begumpet, 1-4-211, Minister Rd, Kondapur														

Flask Application

The web application built with Flask uses a variety of routes and functions to communicate with users. The application incorporates a chatbot function that allows users to retrieve related healthcare facility information by inputting their details, including name, facility type, and postal code. The backend manages user inputs, runs queries against a preprocessed dataset, and shows consumers the relevant data.

```
document.querySelectorAll('input[name="facility-type"]').forEach(function(radio) {
    radio.addEventListener('change', function() {
        const selectedFacilityType = this.value; // Get selected facility type
        // Display the selected facility type and ask for postal code
        displayBotMessage(`<div class="bot-message"><strong>Bot:</strong> You have selected: ${selectedFacilityType}<br><br>Please enter the postal code</div>`);
        document.getElementById('user-input-container').innerHTML = `<input type="text" id="postal-code" placeholder="Type your message...."><button id="submit-postal-code">`;
        /* Provide input field for postal code*/
        /* Event listener for postal code submission*/
        document.getElementById('submit-postal-code').addEventListener('click', function() {
            const postalCode = document.getElementById('postal-code').value;
            /* Validate postal code forms*/
            if (!postalCode || !/\d{6}/.test(postalCode)) {
                displayBotMessage('Please enter a valid 6-digit postal code.');
                document.getElementById('postal-code').value = '';
            } else {
                displayUserMessage(postalCode);
                document.getElementById('postal-code').value = '';
            }
            /*Fetch data from server based on facility type and postal code*/
            fetch(`http://localhost:5050/get_data?facility_type=${selectedFacilityType}&postal_code=${postalCode}`)
                .then(response => response.json())
                .then(data => {
                    if (data.hasOwnProperty('data') && Array.isArray(data.data) && data.data.length > 0) {
                        displayBotMessage(`<strong>Bot:</strong> Here is the information based on your selection:<br>`);
                        data.data.forEach(info => {
                            displayBotMessage(`Hospital Name: ${info['Hospital Name']}<br>
Hospital Type: ${info['Hospital Type']}<br>
Address: ${info['Address']}<br>
City: ${info['City']}<br>
State: ${info['State']}<br>
Postal Code: ${info['Postal Code']}<br>
Email: ${info['Email']}<br>
Contact Number: ${info['Contact Number']}<br>
Rating: ${info['Rating']}<br>
Doctor's Name: ${info['Doctor\'s Name']}<br>
Insurance: ${info['Insurance']}<br>
Emergency Services: ${info['Emergency Services']}<br>
Opening Hours: ${info['Opening Hours']}<br>
Website URL: <a href="${info['Website URL']}' target="_blank">${info['Website URL']}<br>`);  

                    });
                    askAnotherInteraction(); // Call the function to ask for another interaction
                } else {
                    displayBotMessage(`<div class="bot-message"><strong>Bot:</strong> No information found for the selected facility type and postal code.</div>`);
                    askAnotherInteraction(); // Call the function to ask for another interaction
                }
            })
            .catch(error => {
                console.error('Error:', error);
                displayBotMessage(`<strong>Bot:</strong> An error occurred while fetching data.`);
                askAnotherInteraction(); // Call the function to ask for another interaction
            });
        });
    });
});
```

Fig c. index.html

```

def display_information(self, facility_type, postal_code):
    matching_info = []      #initializing an empty list to store dictionaries
    # reading a csv file
    with open('data_clean/clean_healthCare_data.csv', 'r') as file:
        reader = csv.reader(file)  #reading the file content
        next(reader) # Skip the header row
        for row in reader:
            if row[10] == facility_type and row[5] == postal_code:
                matching_info.append({
                    'Hospital Name': row[0],
                    'Hospital Type': row[1],
                    'Address': row[2],
                    'City': row[3],
                    'State': row[4],
                    'Postal Code': row[5],
                    'Email': row[6],
                    'Contact Number': row[7],
                    'Rating': row[8],
                    'Doctor\'s Name': row[9],
                    'Insurance': row[11],
                    'Emergency Services': row[12],
                    'Opening Hours': row[13],
                    'Website URL': row[16]
                })
    if matching_info:
        matching_info = sorted(matching_info, key=lambda x: float(x['Rating']), reverse=True)
        info = "Here is information for your selection:\n"      #initializing the info variable
        for row in matching_info:
            info += '\n'
            info += f'Hospital Name: {row["Hospital Name"]}\n'
            info += f'Hospital Type: {row["Hospital Type"]}\n'
            info += f'Address: {row["Address"]}\n'
            info += f'City: {row["City"]}\n'
            info += f'State: {row["State"]}\n'
            info += f'Postal Code: {row["Postal Code"]}\n'
            info += f'Email: {row["Email"]}\n'
            info += f'Contact Number: {row["Contact Number"]}\n'
            info += f'Rating: {row["Rating"]}\n'
            info += f'Doctor's Name: {row["Doctor's Name"]}\n'
            info += f'Insurance: {row["Insurance"]}\n'
            info += f'Emergency Services: {row["Emergency Services"]}\n'
            info += f'Opening Hours: {row["Opening Hours"]}\n'
            info += f'Website URL: {row["Website URL"]}\n'
        return info
    else:
        return None

```

```

@app.route('/get_data', methods=['GET'])
def get_data():
    facility_type = request.args.get('facility_type')
    postal_code = request.args.get('postal_code')
    #print(facility_type)
    #print(postal_code)

    matching_info = []
    try:
        #print("file before")
        with open('data_clean/clean_healthCare_data.csv', 'r') as file:
            #print("file oppened")
            reader = csv.reader(file)
            next(reader) # Skip the header row
            for row in reader:
                #print(row[10], facility_type, len(row[10]), len(facility_type))
                if row[10] == facility_type and row[5] == postal_code:
                    matching_info.append({
                        'Hospital Name': row[0],
                        'Hospital Type': row[1],
                        'Address': row[2],
                        'City': row[3],
                        'State': row[4],
                        'Postal Code': row[5],
                        'Email': row[6],
                        'Contact Number': row[7],
                        'Rating': row[8],
                        'Doctor\'s Name': row[9],
                        'Insurance': row[11],
                        'Emergency Services': row[12],
                        'Opening Hours': row[13],
                        'Latitude': row[14],
                        'Longitude': row[15],
                        'Website URL': row[16]
                    })
    except Exception as e:
        return jsonify({'error': str(e)}), 500 # Return an error message with HTTP status 500

    if __name__ == '__main__':
        app.run(debug=True, port=5050)

```

Fig d. app.py

```

<script src="https://unpkg.com/leaflet/dist/leaflet.js"></script>
<script>
    // Add this after your existing JavaScript code

    document.addEventListener('DOMContentLoaded', function() {
        // Your existing code...

        // Function to display hospitals on map
        function displayHospitalsOnMap(hospitalsData) {
            // Create a map centered at a specific location
            const map = L.map('map').setView([17.3850, 78.4867], 11); // Set your desired initial coordinates and zoom level

            // Add a tile layer to the map (OpenStreetMap tiles used here)
            L.tileLayer('https://s.tile.openstreetmap.org/{z}/{x}/{y}.png', {
                attribution: 'Map data © <a href="https://www.openstreetmap.org/">OpenStreetMap</a> contributors'
            }).addTo(map);

            // Loop through hospitals data and add markers for each hospital
            hospitalsData.forEach(hospital => {
                const { 'Hospital Name': name, Address, 'Contact Number': contact, Latitude, Longitude } = hospital;

                // Create a marker for each hospital and add it to the map
                const marker = L.marker([parseFloat(Latitude), parseFloat(Longitude)]).addTo(map);

                // Create a popup for the marker to display hospital information
                marker.bindPopup(`
                    <b>${name}</b><br>
                    Address: ${Address}<br>
                    Contact: ${contact}<br>
                `);
            });
        }

        // Retrieve hospital data from the Flask app's global variable
        const hospitalDataFromFlask = JSON.parse('{{ hospital_info|tojson|safe }}');

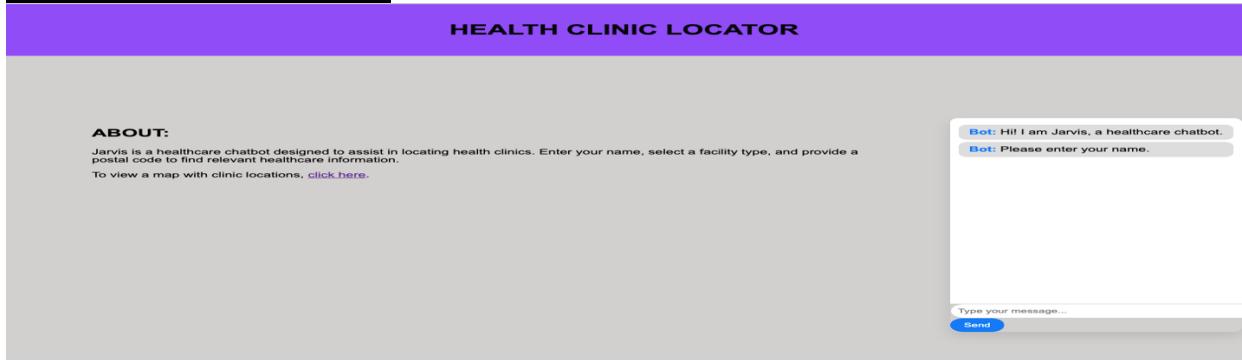
        // Call the function to display hospitals on the map using the data from Flask
        displayHospitalsOnMap(hospitalDataFromFlask);
    });

</script>
</body>
</html>

```

fig e. map.html

Snapshot of the Results:



Bot: Hi! I am Jarvis, a healthcare chatbot.

Bot: Please enter your name.

You: Jack

Hello, Jack!

Please select a facility type:

- General Physician
- Dentist
- Eye Specialist
- Cardiologist
- Pediatrician

Type your message...

Send

Bot: Please enter your name.

You: Jack

Hello, Jack!

Please select a facility type:

- General Physician
- Dentist
- Eye Specialist
- Cardiologist
- Pediatrician

Bot: You have selected: Eye specialist

Please enter the postal code

Type your message....

Send

Bot: You have selected: Eye specialist

Please enter the postal code

You: 500034

Bot: Here is the information based on your selection:

Hospital Name: Challa Eye Care Centre
 Hospital Type: Hospital
 Address: Lane, Rd Number2, Beside Mugdha Art Studio, Sagar Society, Banjara Hills
 City: Hyderabad
 State: Telangana
 Postal Code: 500034
 Email: challaeyecare@gmail.com
 Contact Number: 919849204178
 Rating: 4.8
 Doctor's Name: Dr. Keerthi
 Insurance: Yes

Type your response....

Send

Emergency Services: Yes
 Opening Hours: 8 AM - 7PM
 Website URL: <https://highsighteye|hospitals.com/>

Bot: Do you want to have another interaction?
 (yes/no):

Bot: Great! Let's start another interaction.

Please select a facility type:

- General Physician
- Dentist
- Eye Specialist
- Cardiologist
- Pediatrician

Type your response....

Send

Hospital Name: Little Stars & She | Women and Children Hospital
 Hospital Type: Hospital
 Address: Ascent Towers, 8-2-596, Road No. 10, near SBI Bank, Gaffar Khan Colony, Banjara Hills
 City: Hyderabad
 State: Telangana
 Postal Code: 500034
 Email: info@lsch.in
 Contact Number: 914066992345
 Rating: 4.4
 Doctor's Name: Dr. Satish
 Insurance: Yes
 Emergency Services: Yes
 Opening Hours: 24 hours
 Website URL: <https://www.littlestarsandshe.com/>

Bot: Do you want to have another interaction?
 (yes/no):

no

Send

near SBI Bank, Gaffar Khan Colony, Banjara Hills
 City: Hyderabad
 State: Telangana
 Postal Code: 500034
 Email: info@lsch.in
 Contact Number: 914066992345
 Rating: 4.4
 Doctor's Name: Dr. Satish
 Insurance: Yes
 Emergency Services: Yes
 Opening Hours: 24 hours
 Website URL: <https://www.littlestarsandshe.com/>

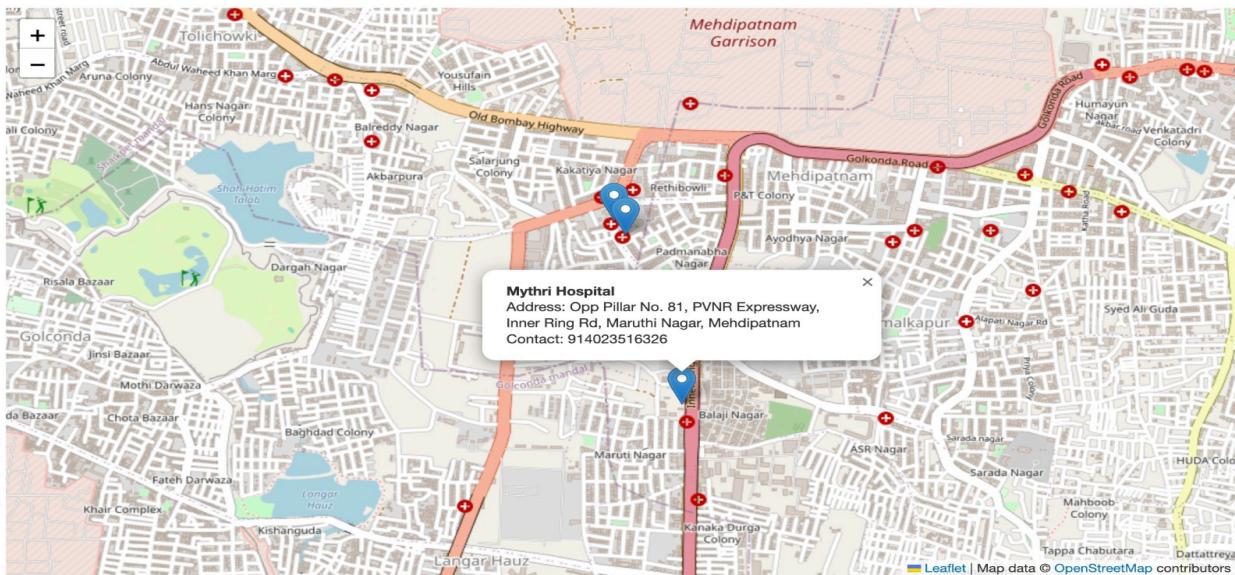
Bot: Do you want to have another interaction?
 (yes/no):

Bot: Thank you for using the Health Care Chatbot. Goodbye!

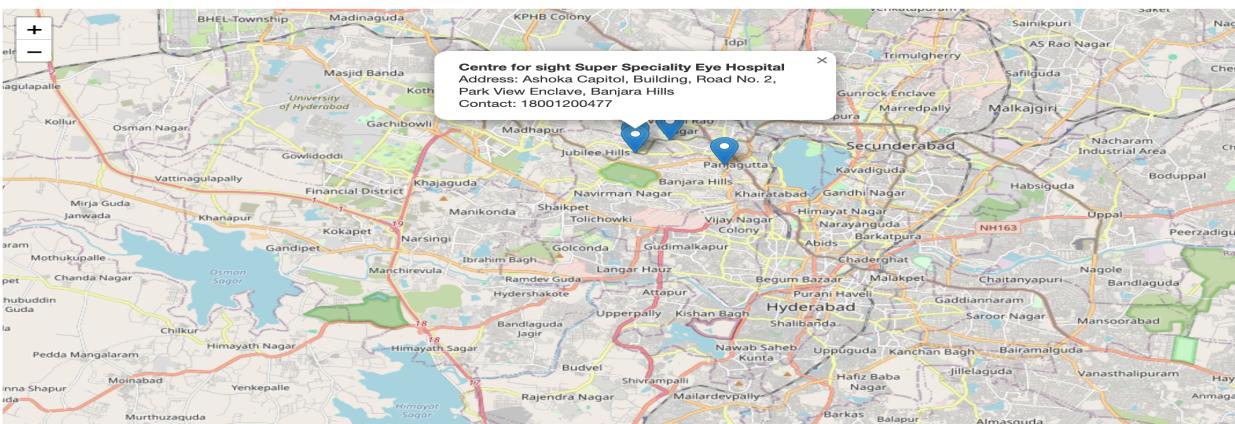
Type your response....

Send

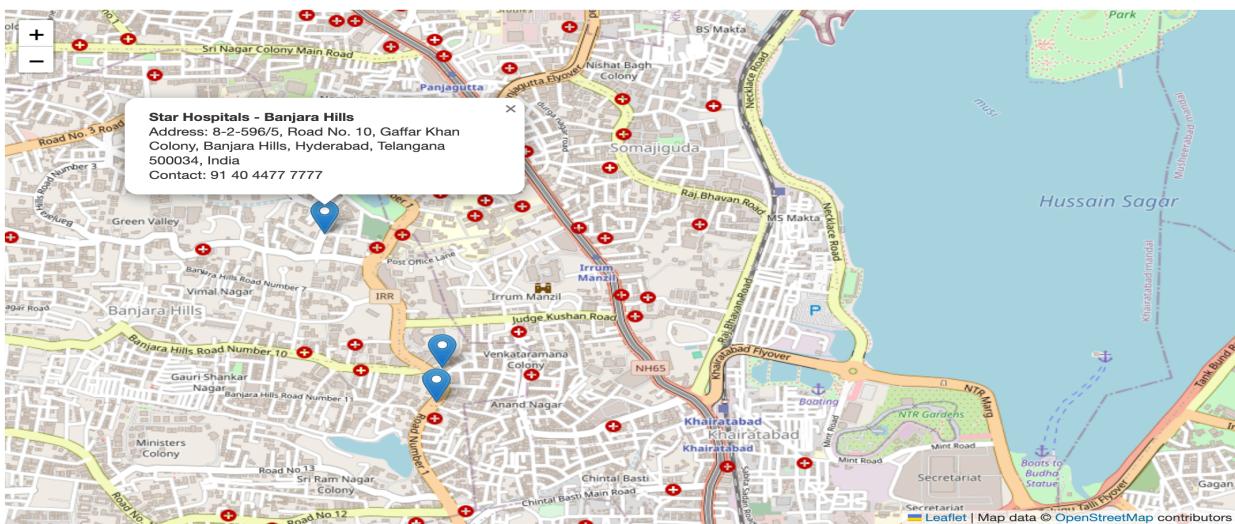
Health Clinic Map



Health Clinic Map



Health Clinic Map



FUTURE SCOPE

This project's future scope includes a number of significant improvements. It entails improving the ChatBot's artificial intelligence (AI) skills to facilitate more individualized interactions, incorporating real-time updates from healthcare facilities, putting geolocation into place for convenient facility location, expanding compatibility to mobile and wearable devices for convenient access while on the go, incorporating sophisticated language models for enhanced comprehension, and cultivating partnerships to expand the dataset with more healthcare options. These updates are meant to improve user experiences and guarantee that the app stays at the forefront of offering trustworthy and easily accessible medical information.

CONCLUSION

This project effectively provides a user-friendly system through a ChatBot and Flask-based web application, allowing quick access to vital information about healthcare facilities according to user preferences. It efficiently closes the gap between user needs and thorough healthcare information by improving raw healthcare data and providing an intuitive interface. Anticipated future developments include the improvement of AI interaction, mobile compatibility, real-time data integration, geolocation features, language model integration, and data enrichment collaborations. These steps position the program as an essential and responsive tool for making educated healthcare decisions, while also promising an improved user experience. All things considered, this project is a significant step toward empowering and granting access to healthcare information while also encouraging continued innovation and user-centered solutions.