

SEMESTER PROJECT REPORT

(2023-2027)

SUBJECT:

Programming For AI

PROJECT NAME:

First Aid Assistant Using GenAI
And Flask

PROGRAM:

BS DATA SCIENCE

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First Aid Assistant

1) Project Overview

The First Aid Assistant is a web-based application that provides immediate medical guidance through an AI-powered chat interface. It combines essential first aid information with a responsive chatbot that can guide users through emergency and non-emergency medical situations.

Features:

- Interactive chat interface for first aid guidance
- Visual first aid reference cards
- Emergency contact information
- Responsive design for all devices
- AI-powered medical advice with emergency detection

2) System Architecture

The application follows a client-server architecture:

- ✓ **Frontend:** HTML, CSS, JavaScript
- ✓ **Backend:** Python Flask
- ✓ **AI Model:** Groq's LLaMA3-8b via LangChain
- ✓ **Communication:** API between frontend and backend

3) File Structure

```
first-aid-assistant/
├── static/
│   └── style.css          # All styling for the application
├── templates/
│   └── index.html         # Main application interface
└── app.py                 # Flask backend and AI integration
└── requirements.txt       # Python dependencies
└── .env                   # Environment configuration (API keys)
```

4)Code File Explanation

I. app.py (Backend Server)

The app.py file serves as the backend server for the project using the Flask framework. It hosts the website and manages the AI chat assistant, which is powered by the Llama 3 model through the Groq platform.

Purpose:

This Python file acts as the server, which:

- the website
- Handles the AI logic for the chat assistant
- Generates responses to user messages

```
1 from flask import Flask, request, jsonify, render_template
2 from flask_cors import CORS
3 from langchain_groq import ChatGroq
4 from langchain_core.prompts import ChatPromptTemplate
5 import os
6 from dotenv import load_dotenv
7
8 load_dotenv()
9
10 app = Flask(__name__, template_folder='templates', static_folder='static')
11 CORS(app)
12
13 llm = ChatGroq(
14     groq_api_key=os.getenv("GROQ_API_KEY"),
15     model_name="llama3-8b-8192",
16     temperature=0.3
17 )
```

```
41 @app.route('/')
42 def home():
43     return render_template('index.html')
44
45 @app.route('/chat', methods=['POST'])
46 def chat():
47     user_input = request.json.get('message', '').strip()
48
49     if not user_input:
50         return jsonify({'message': "Please describe your first aid need"})
51
52     try:
53         response = chain.invoke({"question": user_input})
54         return jsonify({'message': response.content})
55     except Exception as e:
56         return jsonify({'message': "Please describe your issue again"})
57
58 if __name__ == '__main__':
59     app.run(port=5000, debug=True)
```

- The Flask framework is used for the web server.
- ChatGroq is used for AI (using the Llama 3 model).
- It pulls the API key from the .env file.
- There are two routes:
 1. `/`: Serves the homepage.
 2. `/chat`: Handles user messages and generates AI responses.

AI Prompt:

- Instructions are given to the AI about how to respond.
- Special tag `⚠` is used for emergency cases.
- Responses should be short and clear.
- When suggesting medicines, the AI advises users to consult a doctor.

```
19 template = """
20 You are a First Aid Assistant. Provide clear, concise first aid guidance.
21
22 Rules:
23 1. Respond in 1-2 sentences
24 2. Focus on immediate actions
25 3. Only for true emergencies (like cardiac arrest, severe bleeding, unconsciousness, stroke, ma
26 4. For minor issues (nausea, small cuts, mild burns) do not use emergency tag
27 5. If asked about medicines, suggest 1-2 common options with "Consult doctor first"
28
29 Examples:
30 - "Cool burn under running water for 10 mins"
31 - "⚠️ EMERGENCY: Call 1122 immediately - patient is unconscious"
32 - "For pain: Paracetamol (consult doctor first)"
33 - "For nausea, sip water slowly and rest"
34
35 Current issue: {question}
36 """
37
38 prompt = ChatPromptTemplate.from_template(template)
39 chain = prompt | llm
40
```

II. requirements.txt (Dependencies)

This file lists the Python packages needed to run the project.

Packages:

- **langchain_core**: For AI core functions
- **langchain_groq**: For the Groq AI platform
- **flask**: For the web server
- **langchain**: For AI chaining
- **python_dotenv**: For loading environment variables

```
≡ requirements.txt
```

```
1 langchain_core
2 langchain_groq
3 flask
4 langchain
5 python_dotenv
```

III. Environment Configuration

The `.env` file contains sensitive configuration:

GROQ_API_KEY=your_groq_api_key_here

This file should kept secret and not committed to version control. It contain the **Groq API** key for accessing the **LLaMA3 model** and loaded at application startup via **python-dotenv**

```
❶ .env
  1 GROQ_API_KEY="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"
```

IV. index.html (Main Webpage)

The `index.html` file structures the First Aid Assistant website with a hero banner, a two-column layout for first aid tips and the AI chat window, and a disclaimer. It uses external CSS for styling and simple JavaScript to manage sending messages, displaying responses, and showing timestamps, forming the full user interface.

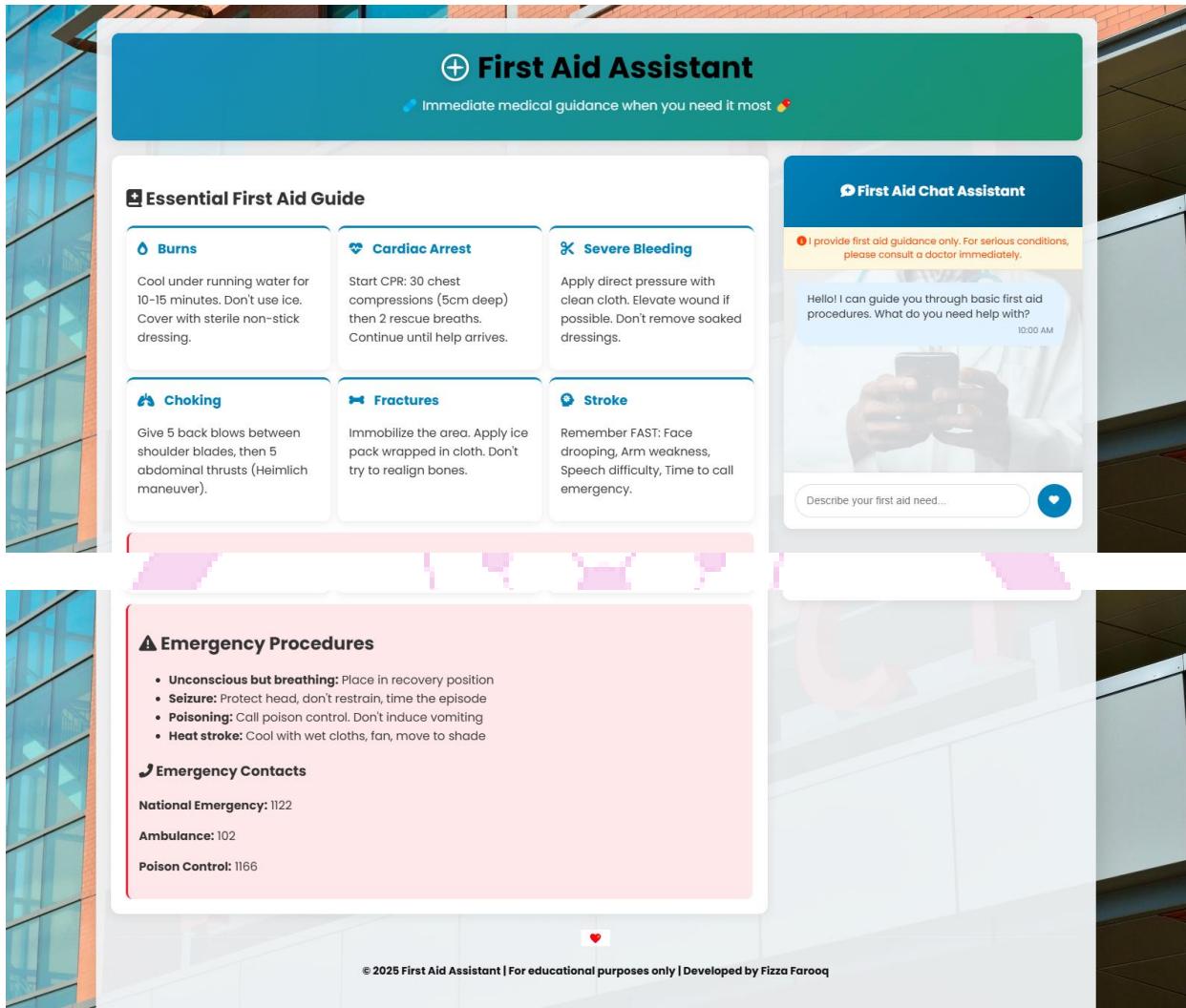
JavaScript Functions:

- **getCurrentTime()**: Fetches the current time.
- **sendMessage()**: Sends the user's message and fetches a response.
- **addMessage()**: Adds a new message to the chat box.

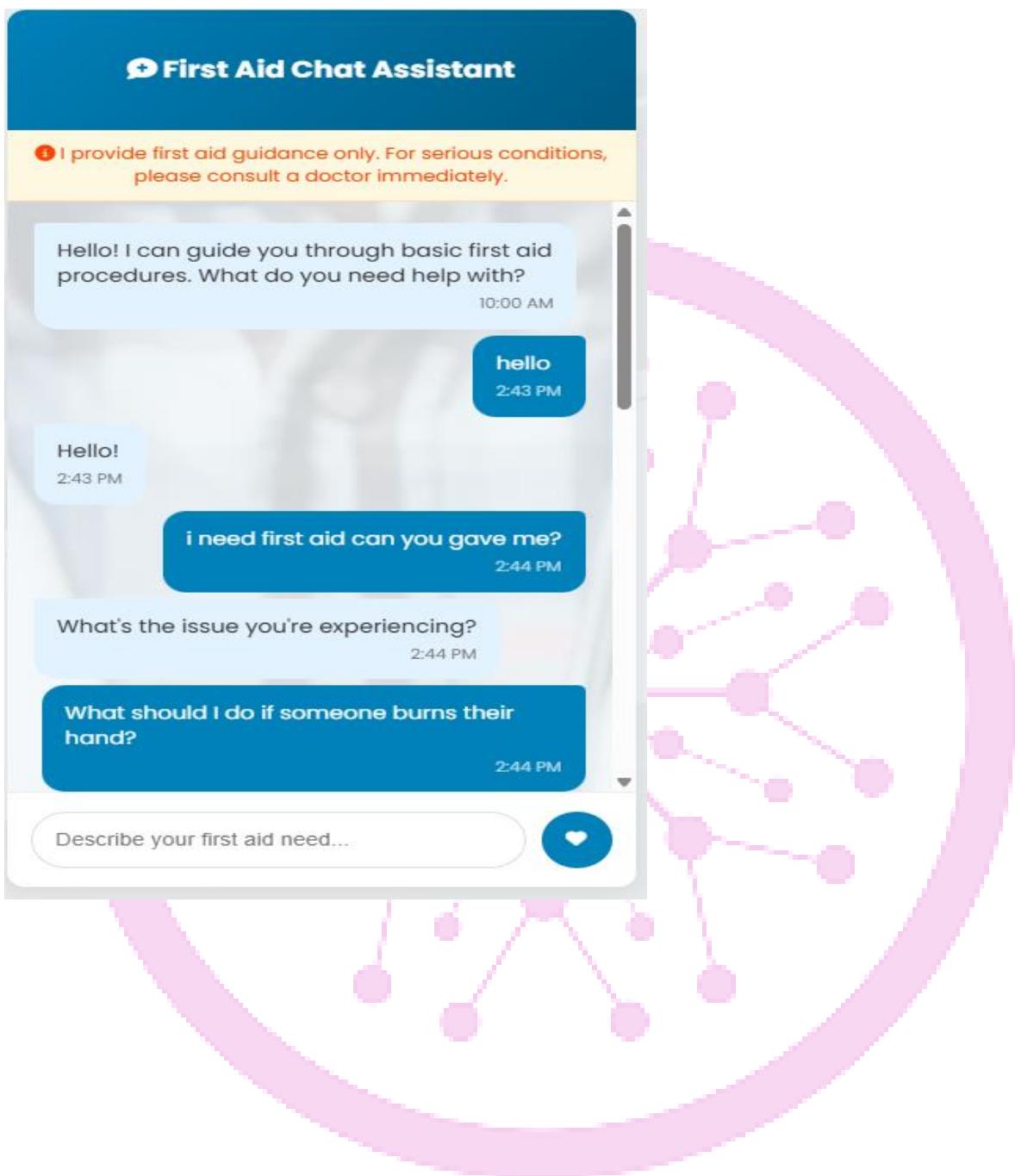
V. style.css (Styling File)

The `style.css` file designs the First Aid Assistant website with a hospital-themed background, a blue-green header, styled chat window, and first aid info cards. It applies distinct colors to user and bot messages, uses red for emergencies, and ensures mobile responsiveness, creating a clean and professional look.

FRONTENT



5) CHATBOT RESPONSE



 **First Aid Chat Assistant**

i I provide first aid guidance only. For serious conditions, please consult a doctor immediately.

Cool burn under running water for 10 minutes to reduce temperature and ease pain.

2:44 PM

What if they faint?

2:44 PM

If someone faints, lay them down on their back, elevate their legs 12 inches, and loosen any tight clothing around their neck, chest, and waist.

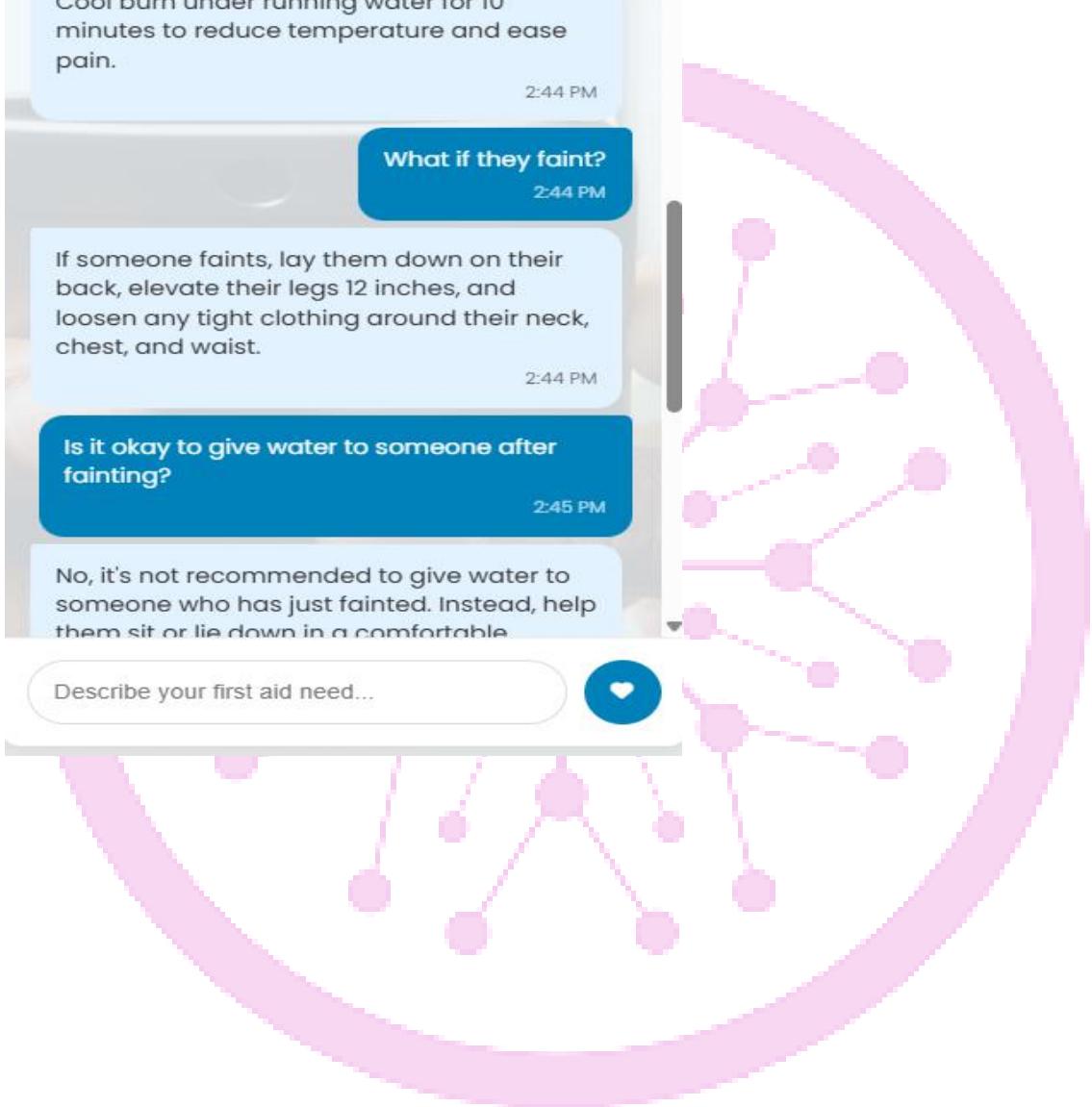
2:44 PM

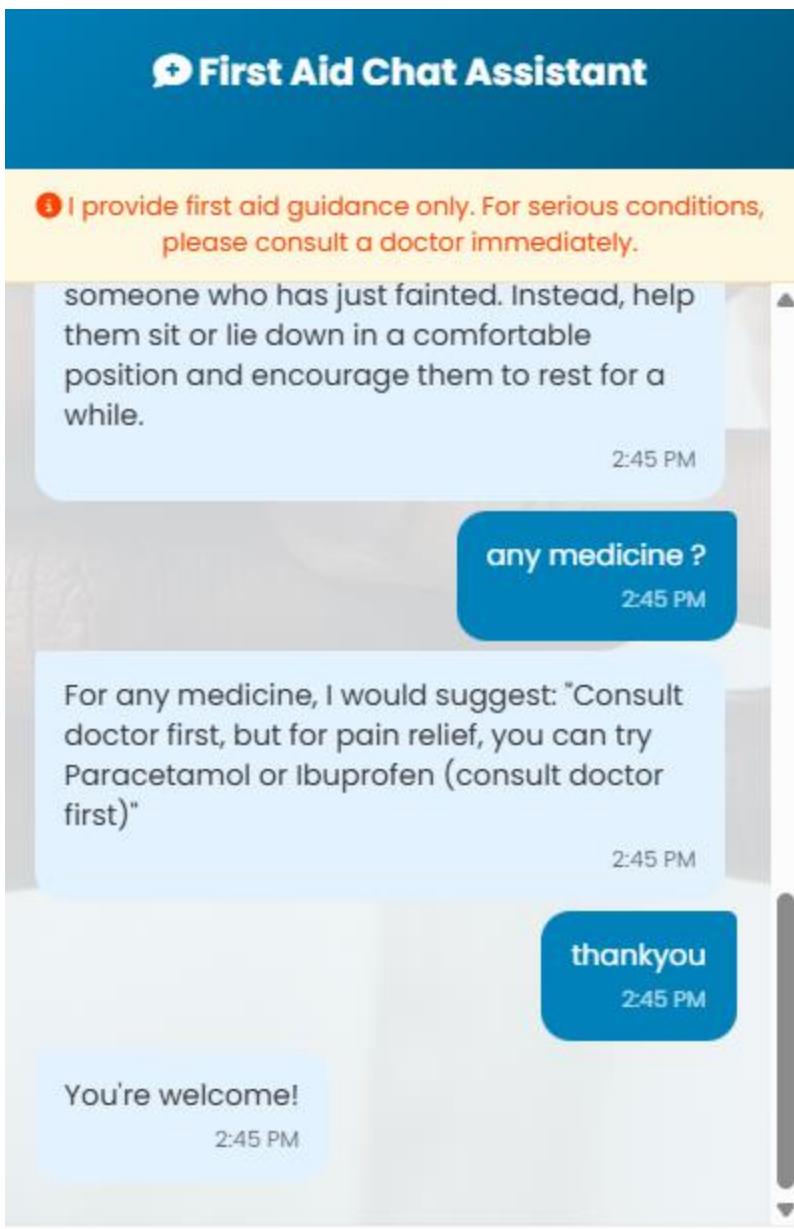
Is it okay to give water to someone after fainting?

2:45 PM

No, it's not recommended to give water to someone who has just fainted. Instead, help them sit or lie down in a comfortable

Describe your first aid need... 





6) Features

a) Interactive First Aid Chatbot:

- AI-powered responses to medical queries
- Emergency situation detection with visual alerts
- Timestamped conversation history

b) First Aid Reference Guide:

- Visual cards for common medical situations
- Emergency procedures checklist
- Local emergency contact information

c) Responsive Design:

- Adapts to mobile and desktop screens
- Accessible color scheme and typography
- Interactive elements with visual feedback

d) AI Integration:

- Groq's LLaMA3-8b model for fast responses
- LangChain for prompt engineering and response formatting
- Emergency detection logic in the prompt template

e) Web Interface:

- Modern CSS with variables for consistent theming
- Animated elements for important alerts
- Responsive layout with flexbox and grid

f) Backend Services:

- Flask REST API for frontend-backend communication
- CORS enabled for potential cross-origin requests
- Error handling for API failures

7) Future Enhancements

Multilingual Support: Add language selection, localized emergency contacts, and translated first aid content to serve diverse users.

- **Enhanced AI Features:** Implement follow-up questions handling, symptom-based triage, and medication interaction checks for more comprehensive guidance.
 - **User Experience:** Introduce chat history saving, favorite cards bookmarking, and location-based emergency service detection.
 - **Technical Upgrades:** Add user authentication, chat persistence, offline mode, and Progressive Web App (PWA) capabilities.
 - **Accessibility:** Improve screen reader compatibility, high contrast mode, and keyboard navigation for inclusive design.
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