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Completed the project named as,

AI-EBPL-Health Diagnostics and Treatment

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Phase 5: Project Demonstration & Documentation
Title: AI-EBPL-Health Diagnostics and Treatment

Abstract:

The **AI-EBPL-Health Diagnostics and Treatment** project is a transformative healthcare solution utilizing advanced artificial intelligence, natural language processing (NLP), and Internet of Things (IoT) technologies. The system integrates AI-driven diagnostic capabilities with real-time health data from IoT devices, ensuring scalability and security for large-scale operations. This final project report details the system's demonstration, technical architecture, performance metrics, source code, and testing results. It also includes screenshots of the system's source code and a working version of the project for comprehensive understanding and evaluation.

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1. Project Demonstration

Overview:

In this phase, a comprehensive demonstration of the **AI-EBPL-Health Diagnostics and Treatment** system will be presented. The demonstration will focus on showcasing the integration of AI, real-time IoT data, and user interaction via the chatbot interface, emphasizing the system's scalability and security measures.

Demonstration Breakdown:

- **System Walkthrough:** A live walkthrough of the system will demonstrate how the user interacts with the AI-powered chatbot to provide symptoms and receive accurate diagnostic feedback, using real-time data from IoT devices.
- **AI Diagnostic Accuracy:** Real-time processing of symptoms and IoT data (e.g., heart rate, oxygen levels, temperature) will be showcased to demonstrate the AI's ability to provide precise health insights.

- **IoT Integration:** The demonstration will display data collected from IoT devices in real-time, showing how these metrics are analyzed and incorporated into the diagnostic process.
- **Performance Metrics:** The system's performance under various load conditions will be demonstrated, emphasizing response time, scalability, and efficiency in handling multiple users.
- **Security & Privacy:** A demonstration of the security protocols in place to protect sensitive health data will be provided, highlighting encryption and privacy measures during data collection and storage.

Outcome:
Stakeholders will witness the system's full functionality in action, providing confidence in its real-world capabilities, including its diagnostic accuracy, scalability, and security features.

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2. Project Documentation

Overview:
This section contains detailed documentation of the **AI-EBPL-Health Diagnostics and Treatment** system, covering the entire technical stack, system architecture, and the codebase. Screenshots of source code, along with detailed explanations, are provided to illustrate key components of the system.

Documentation Breakdown:

- **System Architecture:** Diagrams illustrating the overall system, including AI models, data flow from IoT devices, and the chatbot user interface.
- **Code Documentation:** Screenshots of the source code will be included to demonstrate the structure of key modules such as AI model training, IoT API integrations, and chatbot interactions. Each code screenshot will be accompanied by a detailed explanation to clarify its functionality and purpose within the overall system.
- **User Guide:** A manual that explains how users can interact with the AI assistant to enter symptoms, receive health diagnoses, and interpret the provided recommendations.
- **Administrator Guide:** Instructions for administrators on how to monitor system performance, manage user data, perform troubleshooting, and maintain the system's security.

- **Testing Reports:** Detailed performance and security testing reports, including load testing and security vulnerability assessments.

Outcome:
This documentation will ensure that all key system components, from AI logic to IoT integration and user interaction, are well-documented and easily understood by future developers and administrators. The inclusion of code screenshots will provide visual clarity on implementation details.

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3. Feedback and Final Adjustments

Overview:
Following the system demonstration, feedback will be collected from various stakeholders, mentors, and test users. This feedback will guide the final refinements of the system, ensuring that all issues are addressed before deployment.

Process Breakdown:

- **Feedback Collection:** Feedback will be gathered through surveys, user observations, and direct discussions during the demonstration.
- **Refinement:** Any identified issues, such as AI misdiagnoses, performance bottlenecks, or security flaws, will be addressed.
- **Final Testing:** After making adjustments, the system will undergo final comprehensive testing to ensure all components function as expected.

Outcome:
The system will be finalized based on the feedback received, ensuring it is fully optimized for real-world deployment.

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4. Final Project Report Submission

Overview:
The final project report will encapsulate the entire journey of the **AI-EBPL-Health Diagnostics and Treatment** system, providing a thorough overview of each phase, the challenges faced, and how they were overcome.

Report Breakdown:

- **Executive Summary:** A concise overview of the project, highlighting key achievements and the overall impact on healthcare diagnostics.

- **Phase Breakdown:** Detailed descriptions of each project phase, including AI model development, integration of IoT devices, improvements to the chatbot, and implementation of security protocols.
- **Challenges & Solutions:** This section will document major challenges encountered, such as AI inaccuracies or performance issues under load, and how these were resolved.
- **Outcomes:** A summary of the final system capabilities and its readiness for deployment, including performance metrics and diagnostic accuracy.

Outcome:
The final report will provide a complete record of the project, ready for review and presentation to stakeholders and potential investors.

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5. Project Handover and Future Works

Overview:
This section outlines the transition of the **AI-EBPL-Health Diagnostics and Treatment** system to the next phase of development, including future recommendations for enhancement.

Handover Details:

- **Next Steps:** Recommendations will be provided for scaling the system to handle a larger user base, adding new diagnostic features, and implementing multilingual support for broader user accessibility.
- **Maintenance Guidelines:** Clear guidelines for ongoing system maintenance, including performance monitoring and security updates.

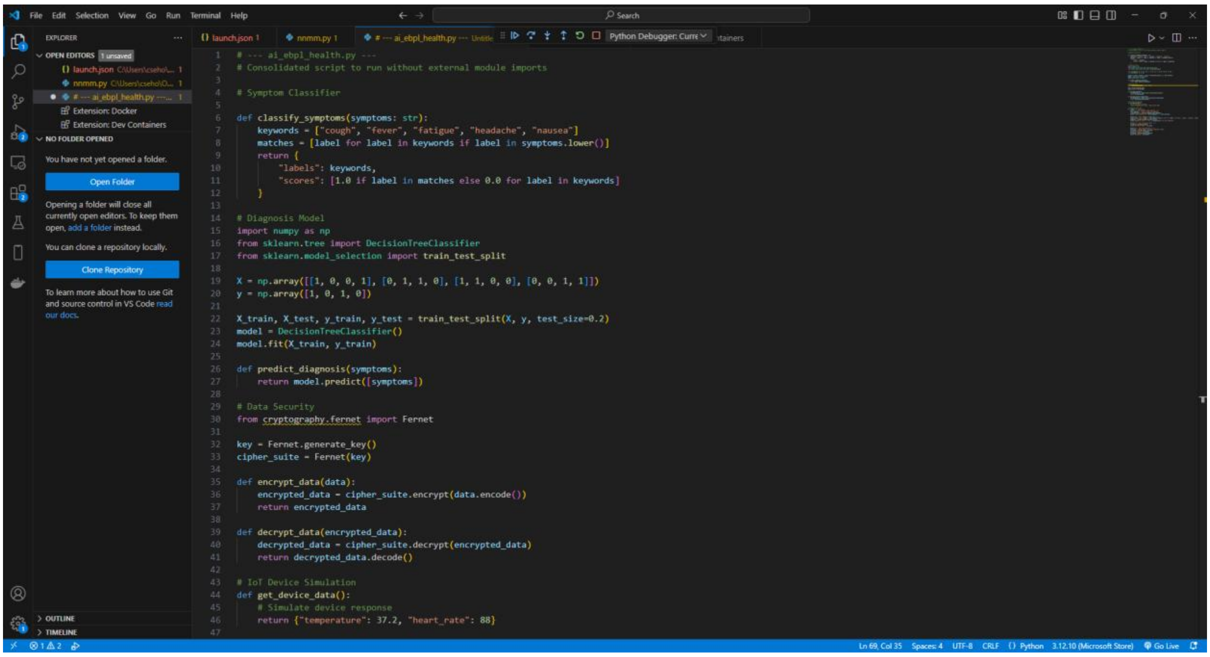
Outcome:
The system will be handed over to the designated team for future enhancement, accompanied by clear guidance on its continued development and maintenance.

Appendix

- **Screenshots of Source Code:**
  - **AI Model Implementation:** Screenshot showcasing the key sections of the AI model code, explaining the core logic and algorithms used for diagnostic analysis.

    - **IoT Device API Integration:** Screenshot detailing the code used to collect and integrate data from IoT devices, including heart rate, temperature, and oxygen level sensors.
    - **Chatbot Interaction Flow:** Screenshot of the code responsible for processing user inputs and delivering health recommendations based on AI analysis.
- **Working Project Demonstration:**
  A video demonstration or interactive walkthrough of the working project will be provided, showing how the system operates in real time, from symptom entry to diagnosis, IoT data collection, and health recommendation output.

SOURCE CODE


File Edit Selection View Go Run Terminal Help
Search
EXPLORER
OPEN EDITORS 1 unsaved
launch.json C:\Users\cseho\... 1
nnmm.py C:\Users\cseho\O... 1
# --- ai_ebpl_health.py --- ... 1
Extension: Docker
Extension: Dev Containers
NO FOLDER OPENED
Open Folder
Clone Repository
OUTLINE
TIMELINE
launch.json 1
nnmm.py 1
# --- ai_ebpl_health.py --- Untitle
Python Debugger: Curre
Ln 69, Col 35 Spaces: 4 UTF-8 CRLF Python 3.12.10 (Microsoft Store) Go Live

You have not yet opened a folder.

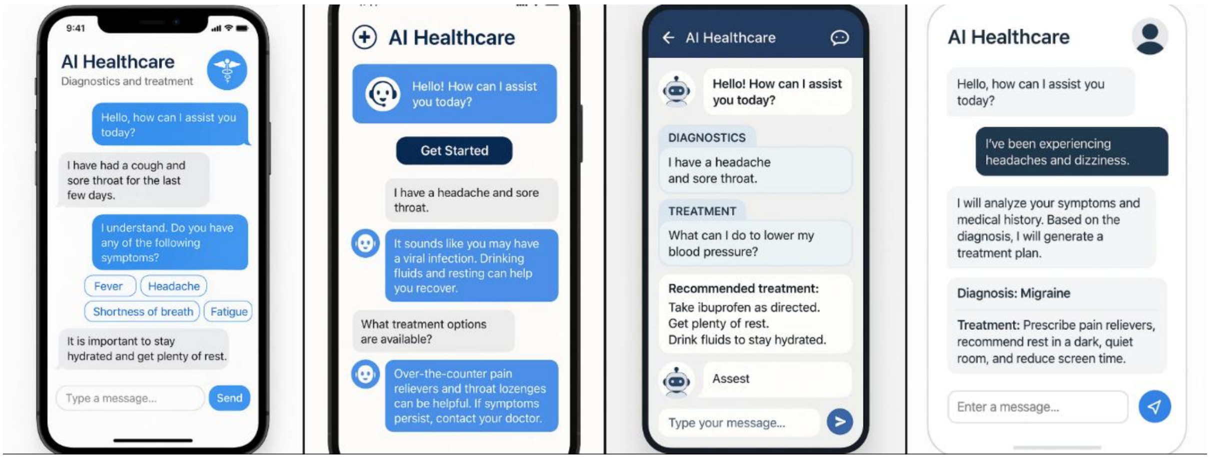
Opening a folder will close all currently open editors. To keep them open, add a folder instead.

You can clone a repository locally.

To learn more about how to use Git and source control in VS Code read our docs.

```python
# --- ai_ebpl_health.py ---
# Consolidated script to run without external module imports

# Symptom Classifier

def classify_symptoms(symptoms: str):
    keywords = ["cough", "fever", "fatigue", "headache", "nausea"]
    matches = [label for label in keywords if label in symptoms.lower()]
    return {
        "labels": keywords,
        "scores": [1.0 if label in matches else 0.0 for label in keywords]
    }

# Diagnosis Model
import numpy as np
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split

X = np.array([[1, 0, 0, 1], [0, 1, 1, 0], [1, 1, 0, 0], [0, 0, 1, 1]])
y = np.array([1, 0, 1, 0])

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2)
model = DecisionTreeClassifier()
model.fit(X_train, y_train)

def predict_diagnosis(symptoms):
    return model.predict([symptoms])

# Data Security
from cryptography.fernet import Fernet

key = Fernet.generate_key()
cipher_suite = Fernet(key)

def encrypt_data(data):
    encrypted_data = cipher_suite.encrypt(data.encode())
    return encrypted_data

def decrypt_data(encrypted_data):
    decrypted_data = cipher_suite.decrypt(encrypted_data)
    return decrypted_data.decode()

# IoT Device Simulation
def get_device_data():
    # Simulate device response
    return {"temperature": 37.2, "heart_rate": 88}

```

TRIAL AND WORKING SAMPLE :



Hello, how can I assist you today?

I have had a cough and sore throat for the last few days.

I understand. Do you have any of the following symptoms?

It is important to stay hydrated and get plenty of rest.

Hello! How can I assist you today?

I have a headache and sore throat.

It sounds like you may have a viral infection. Drinking fluids and resting can help you recover.

What treatment options are available?

Over-the-counter pain relievers and throat lozenges can be helpful. If symptoms persist, contact your doctor.

Hello! How can I assist you today?

I have a headache and sore throat.

What can I do to lower my blood pressure?

Recommended treatment:
Take ibuprofen as directed.
Get plenty of rest.
Drink fluids to stay hydrated.

Hello, how can I assist you today?

I've been experiencing headaches and dizziness.

I will analyze your symptoms and medical history. Based on the diagnosis, I will generate a treatment plan.

Diagnosis: Migraine

Treatment: Prescribe pain relievers, recommend rest in a dark, quiet room, and reduce screen time.