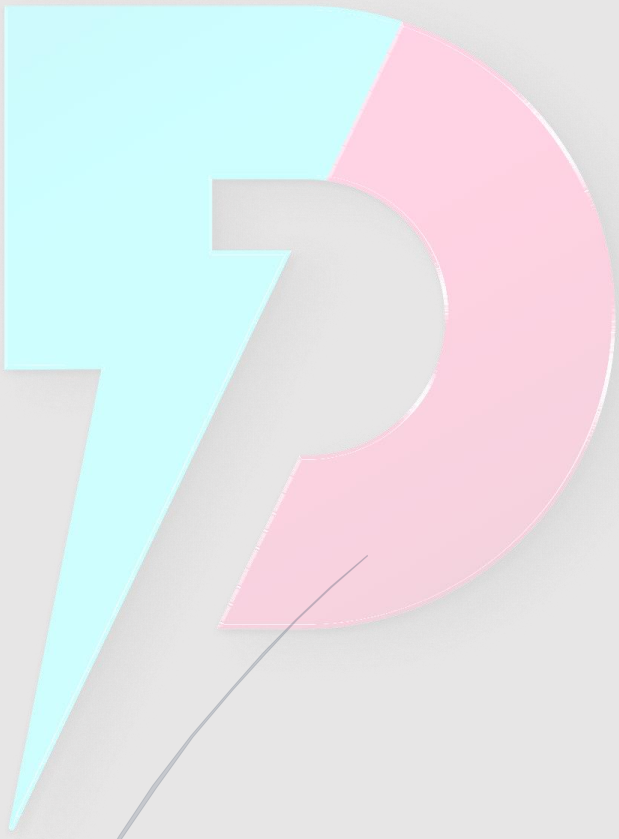
15/07/2025

AI FOR SOFTWARE ENGINEERING FINAL PROJECT REPORT

HEALTH DATA MONITORING DASHBOARD



Power Learn Project

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HEALTH DATA MONITORING DASHBOARD - PROJECT REPORT

1. Project Objectives

The goal of this project is to design a simple **health data monitoring dashboard** using **Flask (Python)** that visualizes simulated health metrics (heart rate, blood oxygen, anomalies). The dashboard provides a clear, user-friendly interface for tracking trends in health data and identifying anomalies over time.

Key Objectives:

- Read health data from CSV files
- Display the latest health metrics
- Visualize trends via interactive charts
- Simulate real-world health monitoring systems

2. Methodology

Tools & Technologies

Tool	Purpose
Python (Flask)	Backend Web Framework
pandas	Data Processing / Analysis
Chart.js	Visualization Library (JS)
HTML/CSS	Frontend / Styling

Workflow

✓ Simulated health data is stored in a .csv file: data/health_data_with_anomalies.csv

✓ Flask reads this CSV file and extracts:

- Latest health record
- Last 100 records for charts

✓ Data is passed to an **HTML template** and rendered in the browser.

✓ **Chart.js** is used on the frontend to generate interactive charts for:

- Heart Rate
- Blood Oxygen

3. System Architecture

User Browser ---> Flask App (Python) ---> CSV Data

| | |

|----HTML / CSS / JS---| |

|<----Charts, Data-----| |

4. Outputs & Visualizations

Latest Health Data (Output Sample)

Displayed in a user-friendly interface:

Timestamp: 2025-07-07 23:59:00

Heart Rate: 62 bpm

Blood Oxygen: 97%

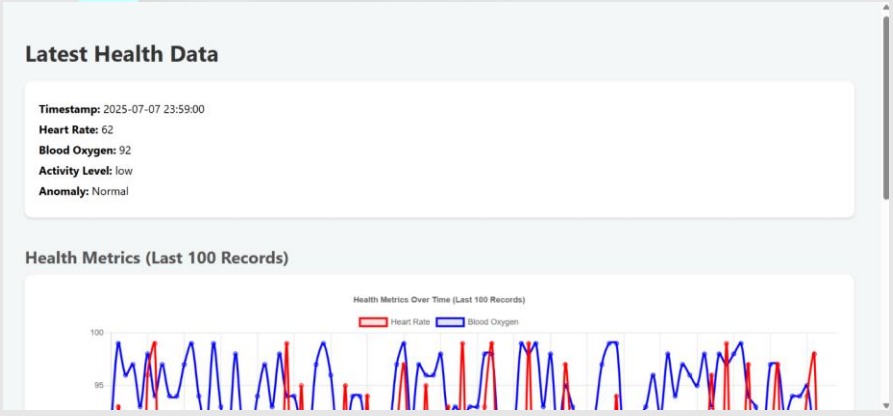
Anomaly: Normal

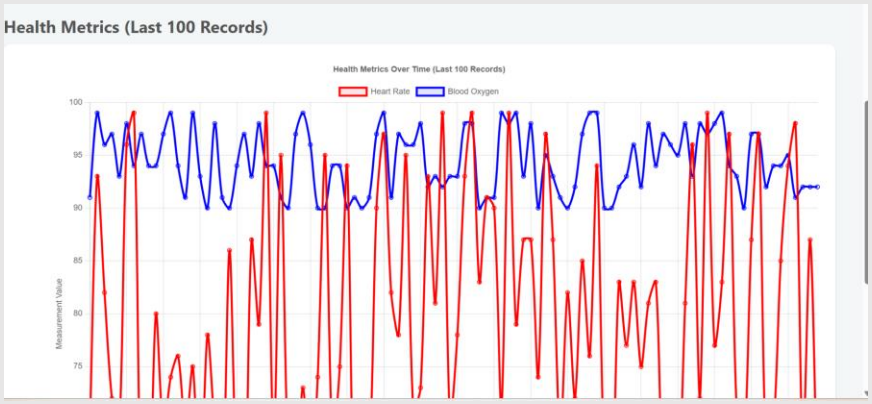
Visualizations

Interactive Line Charts:

- X-axis: Timestamps
- Y-axis: Heart Rate / Blood Oxygen
- Shows health patterns over the latest 100 records.

Screenshots





Results & Insights

- Successfully created a working **local web dashboard**.
- Displays the latest health metrics effectively.
- Visualizes trends clearly through dynamic charts.
- Simulates the foundation for future IoT / AI health projects.

6. Why This Matters

Health monitoring systems are increasingly crucial. This project demonstrates:

-Data visualization for health trends
-Early anomaly identification
-Foundation for wearable integration (future work)

7. Future Improvements

- Deploy to cloud (Azure / Render)
- Integrate live API from devices
- Store data in databases (SQL, NoSQL)
- Add ML models for real anomaly detection (vs static CSV)
- User authentication for personalized dashboards

8. Conclusion

This project showcases how **Flask** can power simple yet effective dashboards for health monitoring. While this prototype runs locally, it mirrors the structure of more advanced systems in healthcare technology.

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