Applications of Artificial Intelligence in IT

PROJECT PROPOSAL

Members of Group:

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Project Title: AI-Chatbot-Aviation-Tracker

Project Description:

We will improve our existing Django-based Airport Tracker (developed last semester for another lecture) by integrating an AI chatbot using DeepSeek-R1. This upgrade will allow users to ask questions about real-time flight data (e.g., delays, routes, aircraft details) using natural language. The AI will analyze data from the **Aerodatabox API** and provide instant, human-like responses.

Note: The **Xmagic API** does not function properly with the WSB university's internet connection.

Key Features (planned for future weeks)

- **Chat Interface**
  A chatbox on the website for asking flight-related questions.
    - Example: "Is TK1991 delayed? What's its new arrival time?"
- **AI Training**
  Teach the AI airport codes, airline terms, and flight tracking rules.
    - Example: "IST = Istanbul Airport, DLH = Lufthansa."
- **Predictive Alerts**
  Simple notifications to inform the user about flight status.
    - Example: "TK1991 has a 90% chance of delay due to weather."

IMPLEMENTATION PLAN

Week 1: Basic Chatbot Integration

- Add a **chatbox template** to the existing airport tracker website.
- Use a **simple rule-based system** for testing.
    - Example: If user asks *"Where is TK1991?"*, the bot replies with a **static map link**.
- **Tools**: Django, HTML/CSS, JavaScript.

Week 2: DeepSeek AI Integration (ongoing)

- *Connect **DeepSeek-R1** to the chatbox.*
- *You're connecting the DeepSeek-R1 AI model to your chatbot, improving flight data tracking, and handling requests efficiently.*
- *You've created endpoints for search functionality (search_flight) and a chatbot interface (chat_assistant), which retrieves flight data via an external API.*
- *The chatbot can answer queries regarding flight status, and you also include a mechanism to handle missing or incomplete data, ensuring only relevant and up-to-date information is shown.*
- Limit the AI's responses by defining where and how it should respond using the data from API.
- Test simple queries like "Give me the flight status of flight TK1991."
- We have updated the interface.

Technology Stack

Presentation Layer

- **Django** – Backend framework for handling requests.
- **HTMX** – Enables dynamic updates without full page reloads.

Intelligence Layer

- **DeepSeek-R1-70B** – AI model for natural language processing.
- **LangChain** – Manages AI-driven conversations.
- **Groq LPU** – Optimizes AI inference for faster responses.

Data Layer

- **Xmagic API** – Used for additional data integration (if applicable).

Team Roles

Kaan Yazıcıoğlu

- Configure **DeepSeek-R1**.
- Train AI with **flight data**.
- Optimize **response accuracy**.

Caner Akcasu

- Develop the **chat interface**.
- Design the **UI/UX**.
- Connect **API/data** to the AI.