Overview

This project is a student-built personal prototype that explores how AI can be safely and responsibly applied to airline bundle and fare selection. It is not affiliated with, endorsed by, or backed by any airline, including WestJet or Air Canada.

The goal is to demonstrate that AI can improve customer experience and commercial outcomes without introducing business risk, by combining large language models with strict airline domain constraints rather than letting an AI freely "answer everything."

1. The Business Case

The Industry Problem

Airlines are facing a growing trust problem. Fare structures are complex, and passengers often feel misled when they encounter unexpected fees (for example, baggage or seat charges discovered at the airport). This confusion hurts customer satisfaction and brand trust.

While travel platforms like Booking.com have successfully used AI assistants to increase conversion and revenue, airlines have been slow to adopt similar tools. The reason is simple: accuracy risk.

The recent case where an Air Canada chatbot hallucinated a refund policy is a clear example of what can go wrong when an AI model is allowed to generate answers without strict controls. Airlines cannot afford chatbots that invent policies, misstate rules, or "recommend crazy things."

The Solution: Domain-Led Design

This prototype based on WestJet takes a domain-first approach to AI design. Instead of letting the AI act as a general customer-service agent, the chatbot operates within a tightly defined scope.

The chatbot is designed to:

- Increase revenue by accurately recommending higher-value bundles (for example, EconoFlex) based on real passenger needs.

- Eliminate risk by explicitly refusing to answer questions outside of bundle and fare selection (such as visas, pets, medical cases, or bereavement policies).

- Rely on public data only, using WestJet as a reference airline because its UltraBasic fare is visible in the public GDS. This allows transparent comparison against higher fare products without relying on private airline data.

Live pricing and fare data are accessed using the Amadeus Public API.

2. Methodology: Leveraging AI and Domain Knowledge

This project was built as a personal student initiative, without professional software engineering resources or airline backing. My background is in aviation commercial strategy and pricing, not full-stack development.

To bridge that gap, I leveraged:

- Basic Java knowledge

- Large Language Models (LLMs) to assist with code generation

- Strong airline domain expertise to define the commercial logic

This approach allowed me to focus on what matters most: translating real airline pricing logic into a working prototype, without getting stuck on low-level syntax.

The core logic is entirely domain-driven:

1. Fare Basis Decoding
   The chatbot maps the bundle specific character of WestJet fares fare basis code (for example, LCVD0LBK) to a specific commercial product (UltraBasic, Econo, EconoFlex, etc.).

2. Scoring and Recommendation Logic
   I translated WestJet's bundle features into a set of weighted variables. The logic applies "penalty points" to bundles that fail to meet user requirements (e.g., lack of carry-on) and "bonus points" for desired features (e.g., flexibility). This deterministic approach guarantees that the recommended bundle is mathematically the best fit for the user's specific criteria.

3. Technical Architecture

The system is split into two main components: a Frontend (user interface) and a Backend (logic and control layer).

Backend Strategy

The backend connects to the Amadeus GDS to retrieve live pricing and fare data. OpenAI is used for:

- Slot extraction (understanding dates, cities, and trip structure)

- Intent classification (understanding what the user is trying to do)

,OpenAI is not used to generate or explain airline policies. All rules, bundles, and constraints are based on predefined logic. This ensures the chatbot never promises something an airline cannot deliver.

By integrating OpenAI's natural language processing, the chatbot maintains a fluid, human-like conversation flow. This allows it to accurately interpret varied phrasing and context, ensuring it understands the user's intent regardless of how the request is worded.

Frontend Strategy

The frontend is designed to be clean, simple, and intuitive. Visual cues (such as icons for bags, seats, and flexibility) are used to make complex airline pricing easier to understand for the average traveler, reducing confusion and decision fatigue.