Project Title: FlightDelayPro

Project Summary:

FlightDelayPro is a web-based application designed to help travelers with choosing the fastest and most time efficient flights based on past flight delays and cancellations. It helps them make informed decisions and reduce travel-related stress. With our comprehensive database and user-friendly interface, we will be able to offer users valuable insights into booking the perfect flight.

Project Description:

Have you ever been stuck in the airport for hours due to flight delays? Have you been scratching your head thinking if there is a quicker way to get to your business meeting or your dream resort? Well, worry no more because FlightdelayPro has you covered.

Travelers often worry about whether they could get to their destination on time due to the uncertain nature of flight delays and cancellations. And the information for the user to estimate if their flight is on time is usually not readily available. FlightDelayPro is created to address this challenge by offering a one-stop solution for users to view past flight delay and cancellation records. The users will also be able to add, update, and delete these records to ensure the accuracy of the database.

Data Stored:

We will use the “2015 Flight Delays and Cancellations” dataset (link: https://www.kaggle.com/datasets/usdot/flight-delays?select=flights.csv). This dataset is from one of the TA-proposed datasets. This dataset stores the information about the delayed flights, like the delayed flights airline, original airport, destination airport, and other more detailed information like the year, month, day of the delay, and the planned departure time.

Basic Functions

For simple features, the users will be able to find a flight with the least number of delays and cancellations by putting in the three-letter code of the start airport and destination airport. The users will also be able to view the past delays and cancellations of any flights by simply putting in the flight number.

And for accuracy’s sake, the users will be able to create, insert, update, and delete flight delay information in the database. For example, if an user inputted the wrong flight time, the user may choose to use the update functionality to fix the mislabeled data in the database.

Creative Component

We will perform a map visualization for the users to directly and conveniently know which airports have a serious history of delays from the map. Specifically, for example, we may plan to make the airports with different levels of delays be labeled with different colors, in order to present an overall overview to the users.

And one other possible creative component that we will add to our application is an AI algorithm that would provide the user with the flight with the least chance of delay and cancellations based on past records. The algorithm would take the day of the week, season, and other information as reference.

Usefulness

We think this application would be useful because it tells us which flights to avoid to prevent delays. It tells us which flight number has had the highest rate of delay in the past, so the user can prevent those flights since they have a higher chance of getting delayed again.

There aren't similar applications or websites out there. All of them only show data of delayed flights, but none of them make it simpler for the user to visualize which flight has the highest chance of delay.

Realness

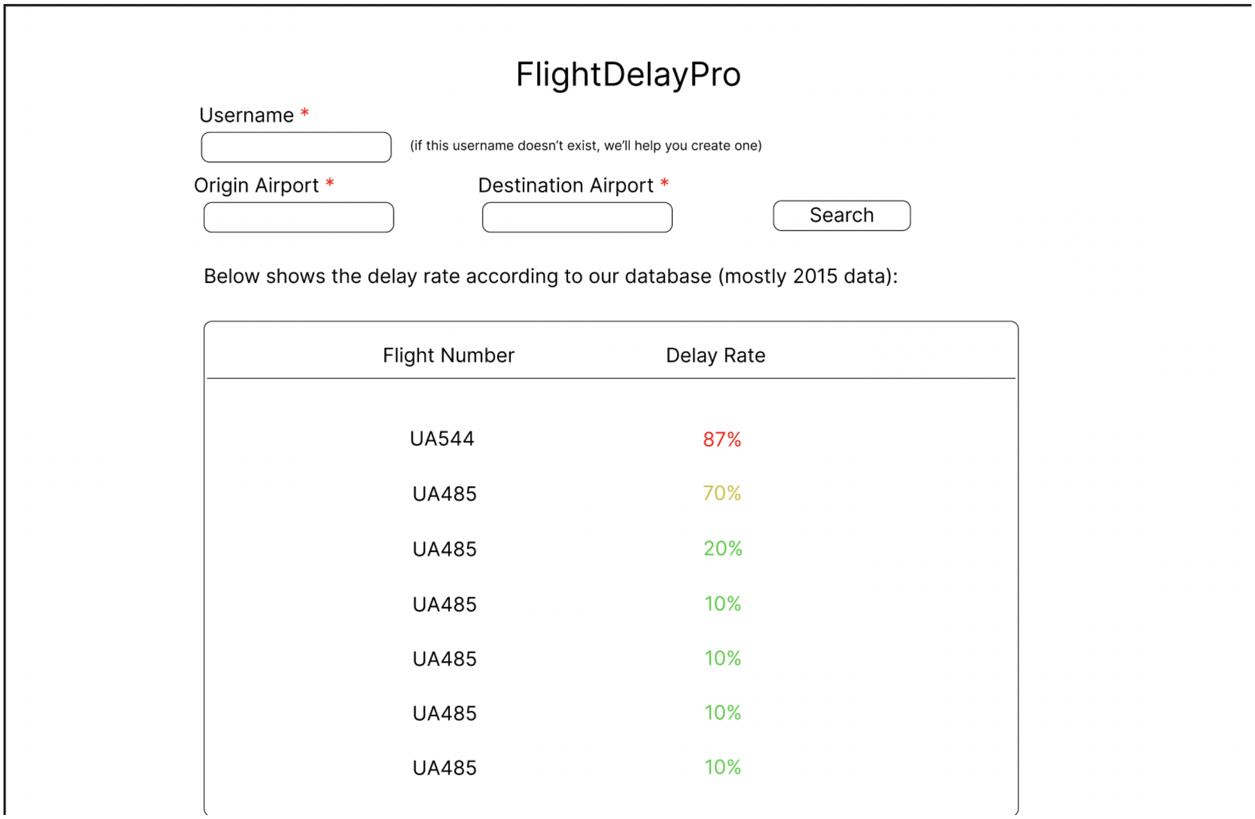
The *2015 Flight Delays and Cancellations* dataset was uploaded by the Department of Transportation on the website Kaggle. According to Kaggle, the data was collected by the US Department of Transportation(DOT) Bureau of Transportation Statistics on the performance of domestic flights operated by large aircraft carriers. It has an accurate description of an airline's delay and on-time information.

For the actual datasets, it consists of three components. The first csv file airlines.csv maps the IATA_code(airline identifier) to the actual airline. The second csv file airports.csv has seven different fields: IATA_CODE, AIRPORT, CITY, STATE, COUNTRY, LATITUDE, LONGITUDE. This part gives geographical information on the airports in the dataset. For the last csv file flights.csv, it has ten fields: YEAR, MONTH, DAY, DAY_OF_WEEK, AIRLINE, FLIGHT_NUMBER, TAIL_NUMBER, ORIGIN_AIRPORT, DESTINATION_AIRPORT, SCHEUDLED_DEPARTURE. Each row of the dataset entails a specific delay.

Functionality

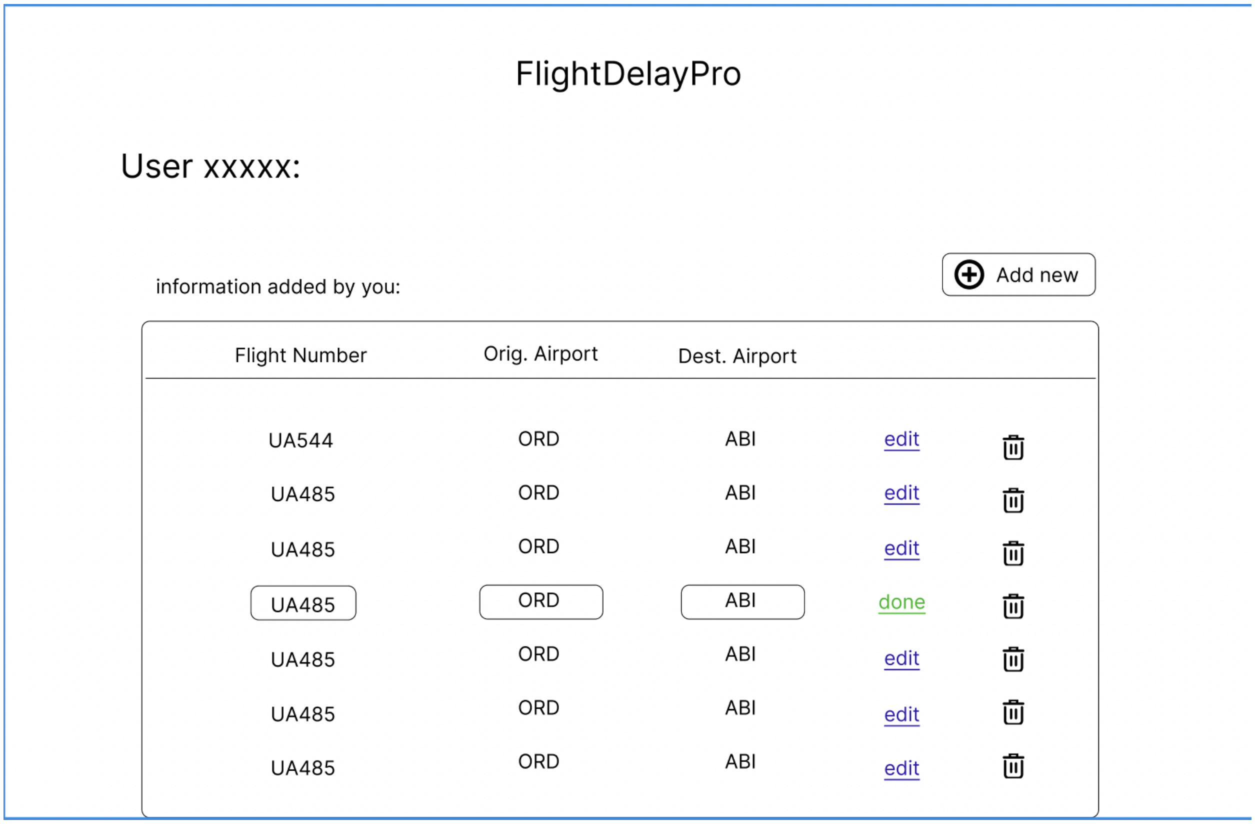
On the website, the user inputs an origin and destination airport, the website will output all the delay histories with that origin and destination. This will be an example of the search operation.
The user can create an account. With an account, you can add delayed flights you know to this existing database. This is an example of the create operation.
If the user accidentally created a wrong delayed information, the user can delete that information. This will be an example of the delete operation.
If the user created an incorrect delayed information, they are able to edit it (e.g. they accidentally input the wrong airline number and would like to change it). This is an example of the update operation.

UI Mockup



Below shows the delay rate according to our database (mostly 2015 data):

Flight Number	Delay Rate
UA544	87%
UA485	70%
UA485	20%
UA485	10%
UA485	10%
UA485	10%
UA485	10%



FlightDelayPro

User xxxxx:

⊕ Add new

information added by you:

Flight Number	Orig. Airport	Dest. Airport		
UA544	ORD	ABI	edit	🗑
UA485	ORD	ABI	edit	🗑
UA485	ORD	ABI	edit	🗑
UA485	ORD	ABI	done	🗑
UA485	ORD	ABI	edit	🗑
UA485	ORD	ABI	edit	🗑
UA485	ORD	ABI	edit	🗑

Project Work Distribution:

Frontend: Stacey, Jack
Set-up Database: Larry
Connect Database to Front-end: Stacey
Importing Dataset to Database: Jack
Backend Stored Procedures and algorithm: Jack, Yanqing, Larry, Stacey