

## **Project Title:** DelayAware24

### **Project Summary:**

DelayAware24 is an application to provide historic details of flight delays and cancellations coming from various airports. The delays and cancellations will be used to analyze the airports and airlines they originate from and then rank the airports based on this cancellation information. Users will be able to view which airports are the most timely, which have the most delays and cancellations, etc. The application will present this information in various formats, including an interactive map and analysis of the best and worst airports. The data will be based on the 2015 Flight Delays and Cancellation data and will also make use of the Google Maps API.

The application is intended to help people find better airports and air paths, especially in emergency cases where delays and cancellations would be disastrous. Similar flight tracking applications exist, however they do not focus on delays and cancellations. Our application will fill this niche, offering more in-depth information and analysis on this topic while being user-friendly.

### **Detailed Description:**

Our application is designed to aid the user in choosing airlines and airports when the primary factor in their consideration is the frequency of delays and cancellations. This is considering a circumstance in which the user has to make an emergency trip or one where time is imperative as this tool will help differentiate between neighboring airports and airlines that offer the same route. Using the 2015 Flight Delays and Cancellations dataset, we are able to incorporate historical data on this topic to find average delays/cancellations per day, extract trends on what days/seasons should be avoided, and rank airlines/airports on this factor, each of which can be searched by airline/airport or ranked in a table view.

Our search bar can take an input of an airport, airline, or route to provide either the above data in the requested format (chosen via dropdown menu bar), though to help visualize airport distances relative to the user's destination while also displaying airport timeliness, our maps component will also pull from this same data and trends. With an input bar for users to enter their route or flight, we can propose better nearby airports or airlines with a better rating that fly that exact route. Our table view will also be able to rank best and worst airlines/airports, helping people utilize this data in an impactful manner to better their travel experiences and ensure that timeliness is the least of their concerns when flying.

### **Usefulness:**

Our chosen application is useful because timeliness of air travel is crucial for many passengers that are traveling for important business or personal reasons. To ensure that they select flights that minimize the likelihood of delays/cancellations, our tool uses historic data to provide a ranking and timeliness index for airlines and airports as well as propose alternative ones for a given route to maximally benefit the user.

A similar application to this that we discovered was FlightRadar24, which has a daily average delay/cancellation index. This, however, exists only for airports and that too only for 300 airports worldwide. Our dataset, on the other hand, covers all domestic flights offered by 13 major US carriers with 332 domestic airports. Additionally, FlightRadar24's service only provides the average delay/cancellation index for a given day, the day before, and the day after (as of the time checked) whereas our application uses historical data to uncover trends going beyond day to day activity for a more comprehensive recommendation of airports and airlines. Our application is also more focused and provides an easier interface to search by airport/route/airline to uncover delay specific information as opposed to generic flight tracking.

**Realness:**

This data about on-time, delayed, canceled, and diverted flights were collected and published by the U.S. Department of Transportation's Bureau of Transportation Statistics. It lists 332 airports, the airlines that serve any of the routes provided, and the flights canceled/delayed/untimely. We got this dataset from Kaggle and this is the link <https://www.kaggle.com/datasets/usdot/flight-delays>.

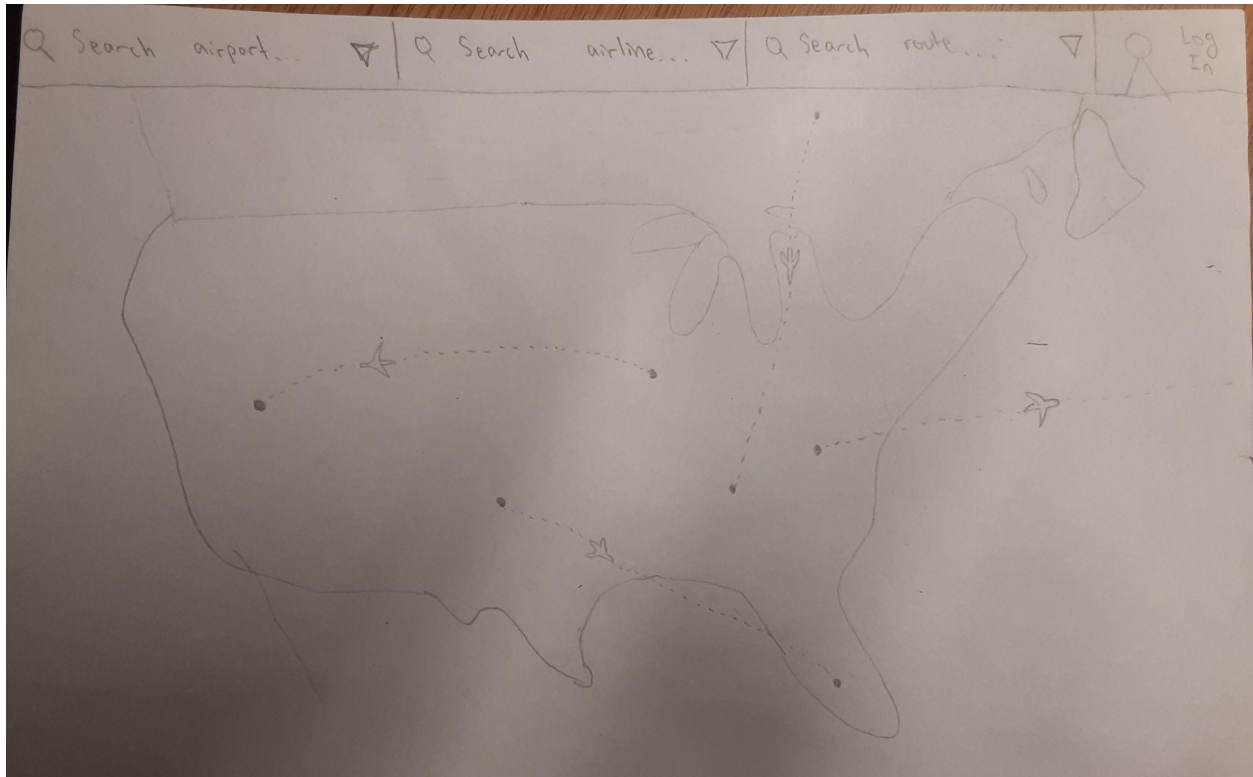
**Functionality**

The main functionality of our application is the extraction of delay and cancellation trends from the 2015 Data. It will provide average delays per day for airports and airlines. Users will be able to filter the data in various ways, such as looking for specific airline delays at a particular airport. Days and seasons that are notable will be highlighted per airport, and users will be able to search for this information as well. It will also be presented in ranked table and graph form. Users will be able to view this information on the map, which will update itself as they search. Users seeking to change flights can find recommendations to airports near their destination, based on lowering the disruption index.

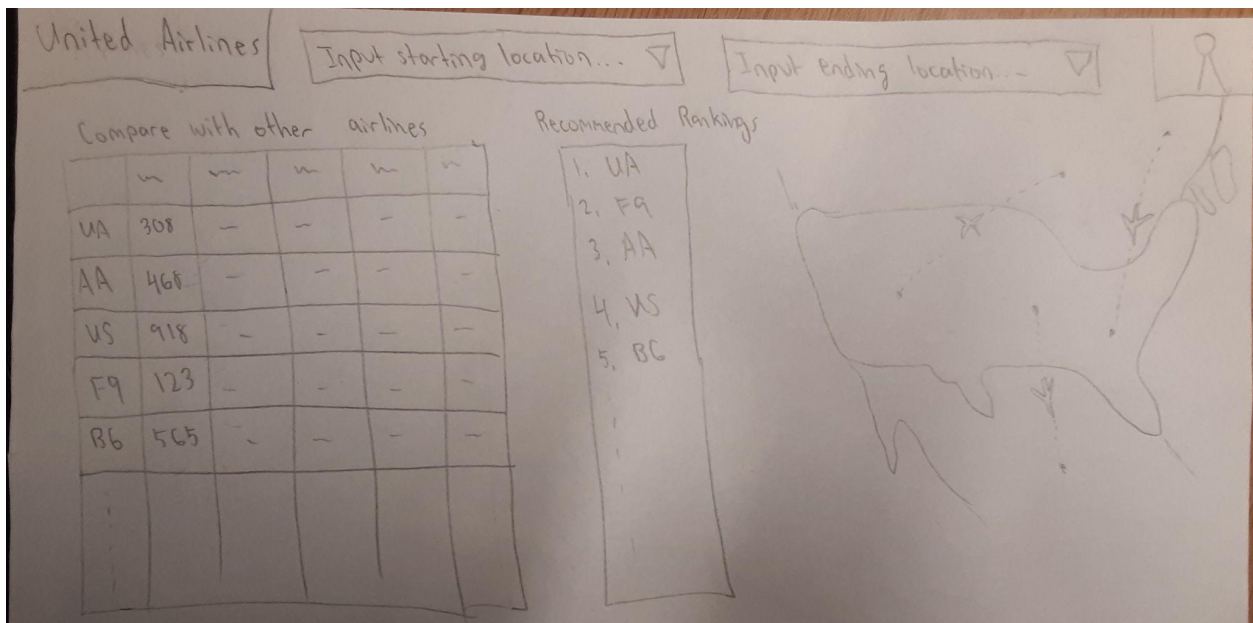
Users will also be able to input their own delay and cancellation data based on their experiences, and the database of the application will be updated to reflect these inputs and also update the data shown to users accordingly. The database will be hosted remotely and can be queried

**UI Mockup:**

Image:



Description: This will be the home page of our website. Using a Google Maps API, we will show current popular flights across the US. There will be three search options: search for airport, search for airline, and search for flight route. We will also include a dropdown menu for each of the three options.



Description: This is an example page of what it will look like after a user chooses a specific airport, airline, or flight route. In this case, the user chose an airline (United Airline). The user will be prompted to input a starting location (which will provide a dropdown menu to choose from) and an ending location (which will also provide a dropdown menu). Based on this input, we will show three things: (1) A comparison of attributes with other airports/airlines/flight routes, (2) recommended rankings of airports/airlines/flight routes based on our algorithms, and (3) a map showing flights that come from the given airport, airline, or flight route.

### **Work Distribution:**

Yuan Su - SQL

- Developing search bars on the frontend and reading from them
- Taking searches from the search bars and generating SQL queries
- Generating CRUD for updating tables with data from users (with Alex)

Aryan - Networking/Middleware

- Pushing generated sql queries to the remote database to retrieve necessary data
- Developing the map interface on the frontend
- Taking requests from ranking tables and generating SQL queries (with George)

Alex - Front end

- Use HTML and CSS to create backbone of website
- Develop website functionalities such as search bars and dropdown menus
- Work on backend (transition between pages linked to base url)
- Generating CRUD for updating tables with data from users (with Yuan)

George - Flex

- Develop website table and graph functionality
- Develop airport recommendation functionality
- Develop user data input functionality
- Taking requests from ranking tables and generating SQL queries (with Aryan)