

Project Proposal - Flight-031

Project Summary

The team is creating a dashboard to visualize data trends in the 2015 Flight Delays and Cancellations dataset and world cities dataset. This includes information about airports, airlines, destinations, and times of the year, which will be presented to users in the form of visualizations. Users will be able to input their preferred airport, destination or time of year and see trends related to flight delays. The dashboard will have two user groups: customers who can access the visualizations and airline employees who can log in and insert or update the data. The aim is to educate users through these trends and provide them with valuable information on how to minimize or avoid flight delays.

Detailed Description

Our team will be creating a dashboard using the 2015 Flight Delays and Cancellations dataset in order to visualize data trends across various airports, airlines, destinations, and times of the year. Using this data, we also plan to configure predictions based on past data. Users of our dashboard will be able to input their preferred airport, destination or time of the year they wish to fly, and our application will give specific recommendations such as specific times to fly, or specific airlines to use in order to minimize flight delay. Another functionality of our app will be that there will be a log in to differentiate customers versus airline employees who are authorized to insert additional data on delayed flights. This will allow our application to continuously be updated with more current data. Customers will only have access to request predictions and look at the visualizations of the data. Our goal with our dashboard will be to educate people through these trends, and more importantly, provide a service recommendation for people to minimize delays.

Usefulness Description

Our proposed application is useful because it allows for people who are looking to book flights to choose the most likely scenario that will have the least possible delay. It is impossible to guarantee that a flight will or will not have a delay, but it is possible to predict how flights will be delayed based on past data of airlines, airports, and time or

day and year. Other similar applications are only able to track an existing flight, after the customer has bought their ticket. These applications like FlightAware.com, or the GateGuru app use data to track the plane's current location, but do not predict which flights may have a higher probability of being delayed in the future. Our application will not track current flights, but instead will provide a new service. Although not websites/applications, there have been at least two research papers completed regarding a similar endeavor. "Flight delay prediction based on deep learning and Levenberg-Marquart algorithm" in the Journal of Big Data and "Flight Delay Prediction" by Bhuvan Bhatia both discuss using machine learning to make predictions for delayed flights. To the best of our knowledge, there has not been any website or application that has allowed users to input criteria for flights and has outputted which airline or time of day will result in the lowest probable delay.

Realness Description

Our application will be using a **TA-proposed** dataset (<https://www.kaggle.com/datasets/usdot/flight-delays>). This dataset deals with flight delays and information we can use to parse the data. This data includes 3 CSV files: airlines.csv, airports.csv, and flights.csv. Under the airlines.csv files, we had the airlines and iata data points as the table columns, under the airports.csv file we have the airport, city, state, latitude and longitude with the iata data points. Finally, under the flights.csv, we have all the information regarding flights such as year, month, day, airline, flight number, etc. Using this information, we can realistically parse data without spending too much time data cleaning, or making sure that we can actually feasibly use this data. Using this data, we hope to achieve a full fledged dashboard that we can use in our project.

Functionality Description

The functionality as we foresee is broken down into **3 segments**:

1. Frontend:
 - a. Users will be able to login using their account, and this will be displayed through a login page. We will have two different levels of users, personal or professional. Using the personal login, this is aimed towards users who just want to lookup information and see trends. The professional account is for companies that want to insert new flight information to the database.

- b. Once a user has been authenticated into the website, they will be able to see two different tabs
 - i. One that contains a lookup to the database where they will be able to send queries regarding flight details such as airline, airport, date, etc. These queries will then be formulated into probabilities for delays based on the different filters provided. If someone is using a professional account, they will be able to delete information, add information or update any existing information regarding the flight, airport or airline details. On this first screen, we will also have an “update” button that the user can click which will trigger an update function to the database.
 - ii. Second, that has trends based off of the data that we have seen to portray delays using graphs generated. These will be based off of the stored procedure scripts that will be looping as the user generates new requests.
 - c. We are planning on using React.js with dashly components to run our frontend.
2. Backend:
- a. This is where we will implement the code that will be handling the users actions on the front end.
 - b. We will execute the backend through the use of Flask and python to make sure we are able to send queries to the database.
3. Database:
- a. Based on what the request is, the database will be able to handle addition, subtraction or will update any information that the user has requested. This SQL query will be another aspect of the full stack app that will be triggered through the actions of the user. The database will serve different functions, but for personal account users, they will only be able to search the database. The professional account users will be able to change, delete and update the database.

Project Proposal

Detailed UI Mockup

<https://www.figma.com/file/oR1H4hdDdmN2S1K8Ov2mEJ/Flight031?node-id=0%3A1&t=DTIYQvbyY3C23yWj-1>

Flight031

Login



Traveling during peak hours or terrible weather?

WE CAN HELP!!!



Will my flight get canceled or delayed? Input your flight details to find out...

Go to [Delay Predictor](#)

Are you an authorized airlines employee? [Login](#) to help us keep the data accurate and up to date!

Flight031

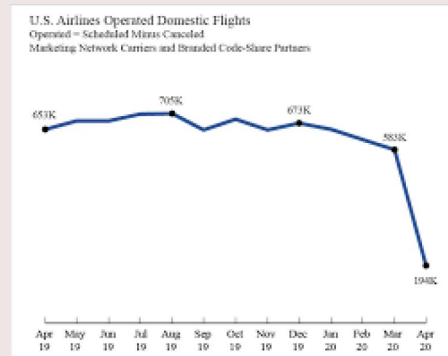
Delay Predictor

Departure Airport: _____

Travel Date: __/__/__

Flight Time: __:__ AM/PM

Airlines: _____



DELAY PREDICTOR:

35%

Work Distribution

Team Leading(Yiteng Zhang):

- Oversee the entire project, making sure that everyone is working towards the common goal.
- Ensure effective communication among team members.

Data Analysis(Yiteng Zhang, Helen Ilkiu):

- Clean, process, and analyze the 2015 Flight Delays and Cancellations dataset.
- Ensure the data is ready for visualization.
- Collaborate with the UI/UX designer to create appropriate visualizations.

UI/UX Designing(Rahul Kasibhatla, Acchindra Uday Thev):

- Design the overall look and feel of the dashboard.
- Ensure the visualizations are user-friendly and effective in communicating insights.
- Collaborate with people taking charge of data analysis to create appropriate visualizations.

Full-stack Developing:

- Front end (Acchindra Uday Thev, Rahul Kasibhatla)
 - Develop frontend of the dashboard
 - Integrate the visualizations and data analysis into the dashboard.
- Back end (Helen Ilkiu, Yiteng Zhang)
 - Develop the backend
 - Implement the user authentication and authorization features.

Deployment (Yiteng Zhang, Acchindra Uday Thev):

- Deploy both part of the system and dataset on Google Cloud Platform (GCP)

Document Maintenance :

- Write reference documentation to explain the code (Each member take charge of himself/herself code)
- Remind others to update related documents and organize/polish documentations (Helen Ilkiu, Rahul Kasibhatla).