Network Analysis of Flights Between US Cities

Topic Overview

A comprehensive analysis of the flight network within the US, focusing on flight distribution, airline punctuality, and hub significance.

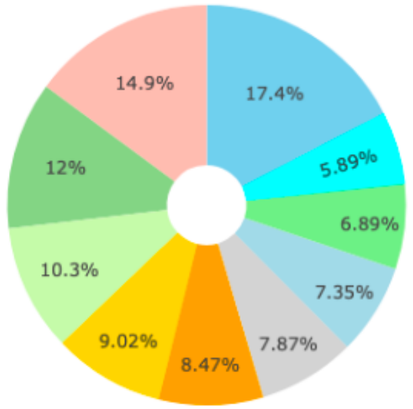
Problem Statement

Addressing the need for improved flight scheduling, reduction of delays, and optimization of the US flight network for better economic and operational outcomes.

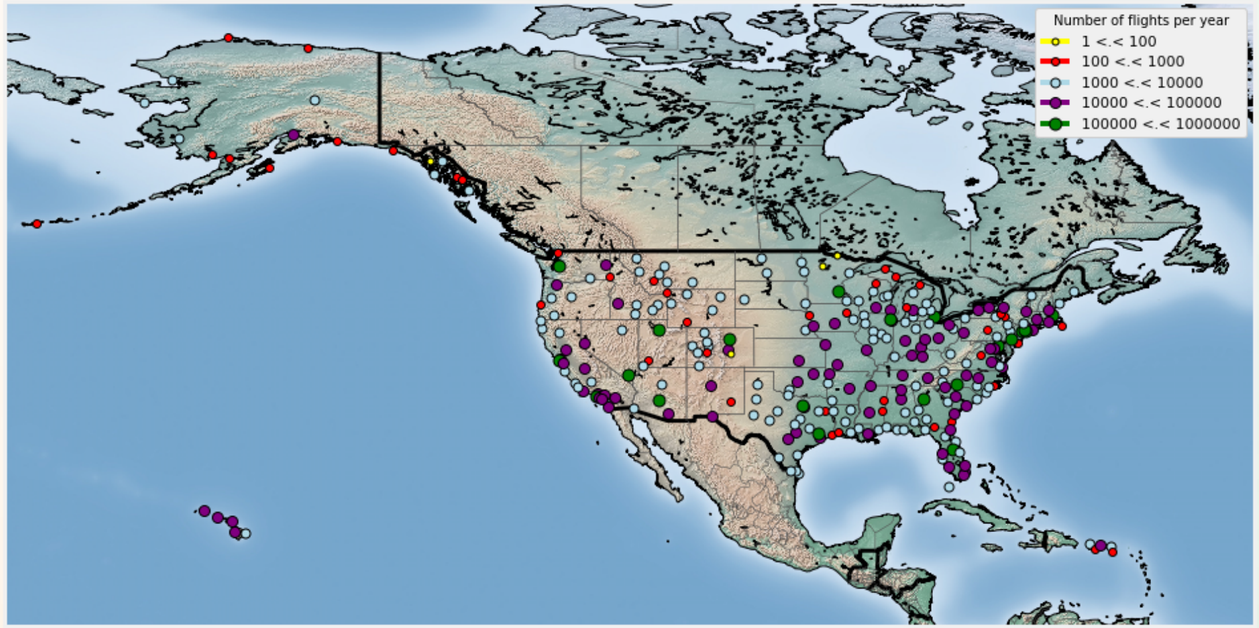
Dataset Utilization

Data from the 2008 US Flight database, containing over 7 million records of domestic flights across various airlines and airports.

Data Gathered from: https://www.kaggle.com/datasets/vikalpdongre/us-flights-data-2008



- Blue: Hartsfield-Jackson Atlanta International Airport - 17.4%
- Salmon: Chicago O'Hare International Airport - 14.9%
- Green: Dallas/Fort Worth International Airport - 12%
- Light Green: Denver International Airport - 10.3%
- Yellow: Los Angeles International Airport - 9.02%
- Orange: Phoenix Sky Harbor International Airport - 8.47%
- Grey: George Bush Intercontinental Airport - 7.35%
- Grey Blue: McCarran International Airport - 6.89%
- Leaf Green: Detroit Metropolitan Airport - 5.89%
- Bright Blue: Newark Liberty International Airport - 4.7%



Methods Employed:

Data was processed and analyzed using Python, with statistical techniques to evaluate flight patterns and delays. Network analysis was applied to visualize connections and traffic volume.

Conclusion:

The analysis revealed that a small number of major hubs are responsible for a significant portion of US air traffic, leading to potential vulnerabilities in the network.

Envisioned Impact:

Insights from this study can guide infrastructure development, policy-making, and operational adjustments in the airline industry, leading to more reliable and efficient air travel.