



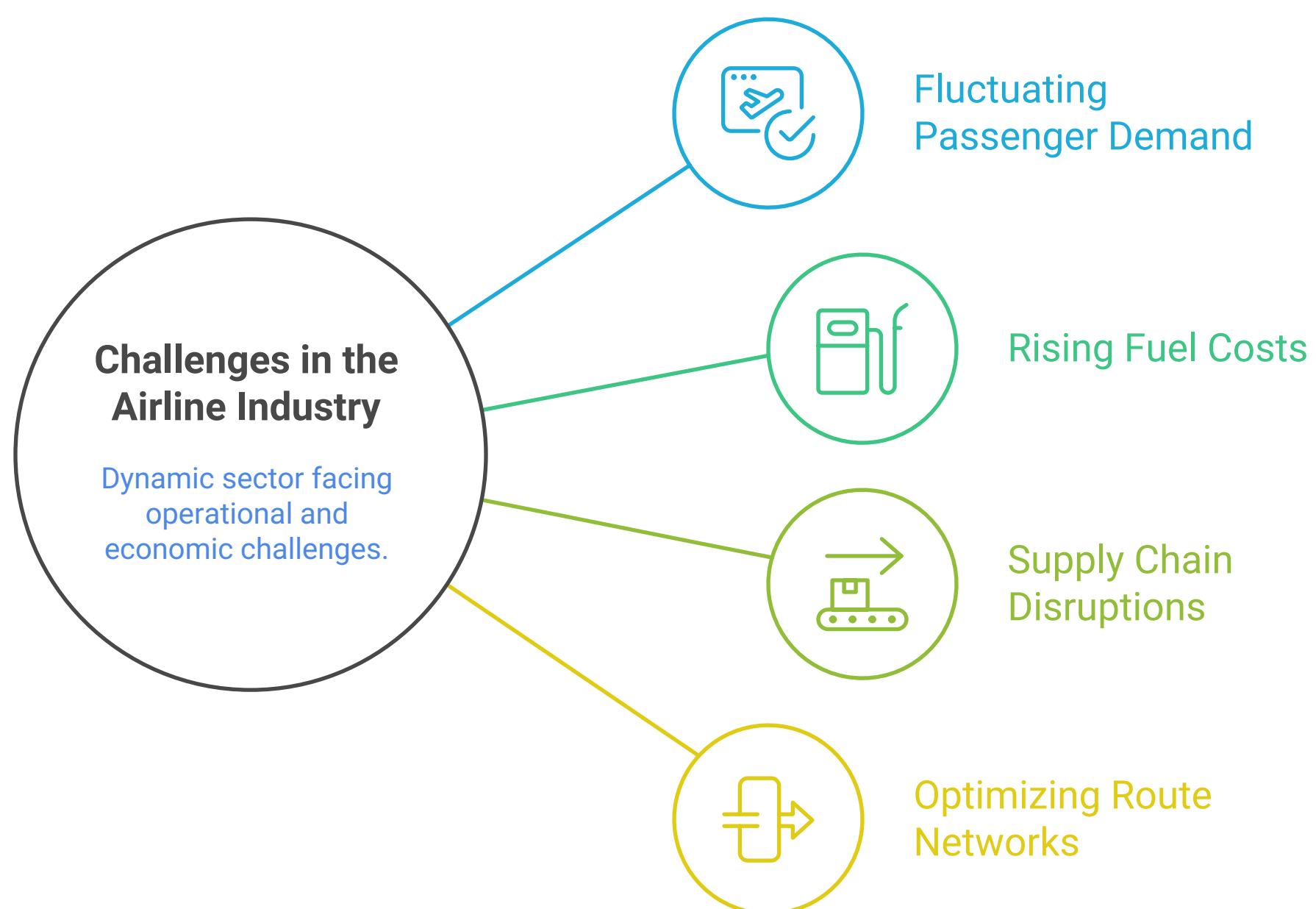
# SQL Project: Airport Data Analysis



## Introduction and Business Case Study

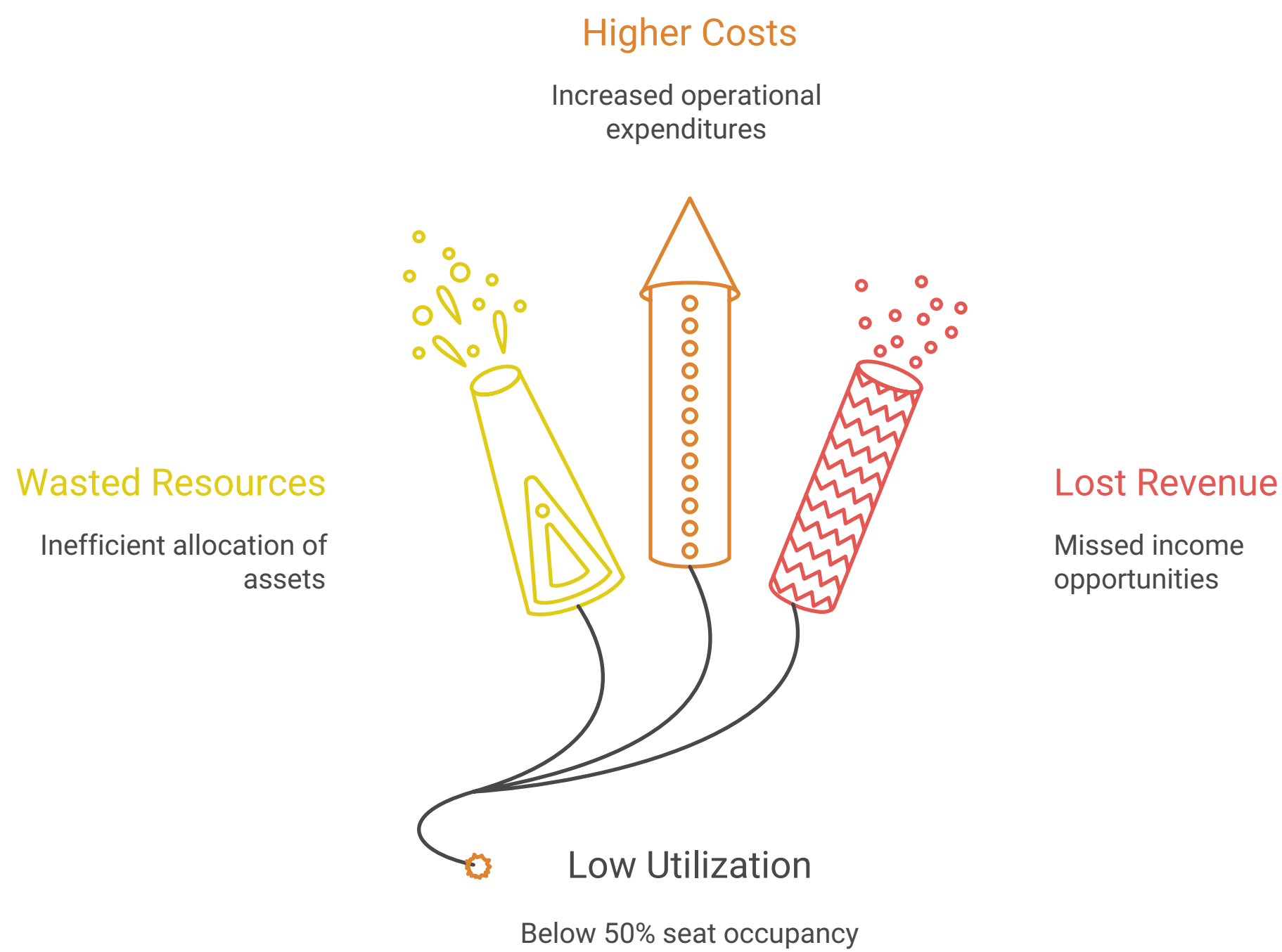
The airline industry is a dynamic and competitive sector where data-driven decision-making is crucial for operational success, profitability, and customer satisfaction. In recent years, airlines have faced significant challenges, including fluctuating passenger demand, rising fuel costs, supply chain disruptions, and the need to optimize route networks in response to changing travel patterns.<sup>3</sup>

### Navigating Challenges in the Airline Industry



Consider the case of AeroConnect Airlines, a fictional regional carrier based in the Pacific Northwest. AeroConnect operates flights connecting major hubs like Los Angeles [LAX], San Francisco [SFO], Portland [PDX], and New York [JFK] with smaller destinations such as Bend, Oregon [RDM]. Despite steady growth in overall air travel post-pandemic, AeroConnect has experienced declining profitability on certain routes due to low seat utilization rates averaging below 50% on long-haul flights. Additionally, seasonal fluctuations—such as increased summer travel to outdoor destinations like Bend—have not been adequately anticipated, leading to overcapacity in off-peak months and shortages during peaks. This has resulted in wasted resources, higher operational costs, and lost revenue opportunities.

## Low Seat Utilization Impacts AeroConnect



Furthermore, AeroConnect's leadership suspects that city population sizes play a significant role in passenger volumes and flight frequencies. Larger cities like New York and Los Angeles naturally drive more traffic, but correlations with smaller cities could reveal untapped markets or the need for adjusted marketing strategies. Without deep insights into these patterns, the airline risks inefficient resource allocation, such as deploying large aircraft on low-demand routes or ignoring growth in populous origin cities.

# Objectives

To analyze Airport Data to identify key factors such as airport operations by examining total passenger numbers and trends per route, average passengers per flight, and flight frequency. It will compare passenger numbers across origin cities, assess available seats, and identify popular destination airports. Additionally, the project will explore correlations between city population and passenger counts, as well as the impact of population size on flight frequency.

Specific goals include:

- Identifying high-traffic routes and underutilized ones to guide route optimization.
- Analyzing seasonal and year-over-year trends to improve forecasting and scheduling.
- Evaluating seat utilization and distance metrics for capacity planning.
- Incorporating city population data to assess demographic influences on travel demand.