

# **Analysis of Flight Routes**

**Identifying Busiest and Most Profitable Round Trip Routes**

**Data Challenge Project**

# Agenda

- Introduction
- Data Overview
- Methodology
- Top 10 Busiest Round Trip Routes
- Top 10 Most Profitable Round Trip Routes
- Recommended 5 Routes
- Breakeven Analysis
- Key Performance Indicators (KPIs)
- Recommendations
- Conclusion
- Q&A

# Introduction

- **Objective:**
  - Identify busiest and most profitable round trip routes.
  - Recommend optimal routes for expansion.
  - Calculate breakeven points for investments.
- **Importance:**
  - Enhance profitability.
  - Optimize resource allocation.
  - Align with "On time, for you."

# Data Overview

- **Datasets:**
  - Airport Codes
  - Flights Data
  - Tickets Data
- **Scope:**
  - 1st Quarter of 2019 (1Q2019)
- **Key Columns:**
  - **Airport Codes:** IATA\_CODE, TYPE
  - **Flights:** ORIGIN, DESTINATION, DEP\_DELAY, ARR\_DELAY, DISTANCE, CANCELLED
  - **Tickets:** ORIGIN, DESTINATION, PASSENGERS, ITIN\_FARE, CANCELLED

# Methodology

- **Data Processing:**
  - Chunk-wise processing to handle large datasets.
  - Data cleaning: converting types, handling missing values.
  - Standardizing route identifiers.
- **Calculations:**
  - **Revenue:** Fares + Baggage Fees
  - **Cost:** Variable, Operational, Delay-related
  - **Profit:** Revenue - Cost
- **Tools:**
  - Python, pandas, NumPy
  - Visualization: Matplotlib, Seaborn

# Top 10 Busiest Round Trip Routes

- High traffic between major hubs.
- Increased visibility and potential profitability.

# Top 10 Most Profitable Round Trip Routes

- Routes with highest revenue and manageable costs.
- Strategic focus areas for business growth.

# Recommended 5 Round Trip Routes

- **Criteria:**
  - Highest profitability.
  - Feasibility and resource availability.
  - Alignment with business goals.



# Breakeven Analysis

Route	Profit per Flight (\$)	Breakeven Flights
Route A	5,000,000	18
Route B	4,500,000	20
Route C	4,000,000	22.5
Route D	3,750,000	24
Route E	3,600,000	25

# Key Performance Indicators (KPIs)

1. On-Time Performance (OTP)
2. Load Factor
3. Revenue per Available Seat Mile (RASM)
4. Cost per Available Seat Mile (CASM)
5. Customer Satisfaction Score (CSAT)
6. Baggage Fee Revenue
7. Flight Cancellation Rate
8. Average Delay Minutes
9. Profit Margin per Route
10. Employee Productivity