**ANA 502 Capstone Project Preparation**

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**Preliminary proposal:**

**Optimizing Flight Prices: A Data-Driven Approach to Finding the Cheapest Flight Tickets**

**Proposed Topic:**

This capstone project aims to analyze historical flight data to identify patterns and trends that influence flight ticket prices. The goal is to develop a dashboard that helps users find the cost-effective flight tickets based on various factors such as departure date, booking date, airline, time of day, and destination. The analysis would aim to include identifying the best time to book a flight and the most cost-effective routes between popular cities.

**Relevance and Interest:**

With air travel gradually getting expensive, understanding how to optimize flight prices is of significant value to consumers. By leveraging data analytics, I will seek to provide a tool that enables users to make informed decisions when booking flights. It is relevant in today's era as travelers look to maximize savings while ensuring convenience.

**End Goal:**

The final outcome will be an interactive Tableau dashboard that visualizes key insights and allows users to explore the cheapest flight tickets based on their preferences like destination, seasonality or airline. It will also provide users with data-driven recommendations on when to book to get the best deals.

**Methodology:**

The methodology will include the following steps:

**Data Collection:**

Use publicly available datasets on historical flight prices from sources like Kaggle, Skyscanner, or Google Flights API.

Collect data on factors affecting flight prices such as departure/arrival times, days of the week, seasons, airline, and route.

**Data Cleaning and Preprocessing:**

Clean and preprocess the flight data, ensuring that any missing values are handled, and irrelevant information is removed.

Convert date formats, normalize prices, and categorize airlines and routes to ensure consistency.

**Exploratory Data Analysis (EDA):**

Analyze the dataset to uncover patterns and correlations in ticket prices. For example, examine how prices fluctuate based on:

* Advance booking: How does booking early or late impact ticket prices?
* Seasonality: How do prices change during peak seasons, holidays, or weekdays versus weekends?
* Airlines: Are certain airlines consistently cheaper on specific routes or times?
* Route-specific trends: Analyze price differences between popular and less-traveled routes.

**Data Visualization in Tableau:**

Build interactive dashboards in Tableau to present the findings. Visualizations could include:

* Heatmaps showing the cheapest days to fly.
* Line charts for price trends over time.
* Comparative bar charts for different airlines, routes, or times of the year.
* Interactive filters for users to explore specific routes, destinations, and timeframes.

**Anticipated Results:**

* Identification of best times to book (e.g., 60 days in advance for a specific destination or during a low-demand period).
* Cheapest days of the week to fly, such as midweek versus weekends.
* Insights on which airlines consistently offer lower prices for specific routes or times.
* Patterns in how prices fluctuate due to seasonality and how users can leverage this data to save money.
* An interactive Tableau dashboard allowing users to search for routes and find the cheapest travel options based on historical trends.