Data Engineering Projects in relation to my field

Introduction
This document outlines five data engineering projects that is built around my interest and can be applicable to the real world. Each project focuses on simulating real-time data, processing it, and optionally visualizing the insights. These projects will help me build confidence in working with streaming data pipelines, automation, and analysis.

1. Music Streaming Live Tracker

Description:
Simulate how users play music in real-time, similar to Spotify. You'll collect song plays as they happen and analyze which songs or artists are trending.

What I Will Do:

- Write a Python script that generates fake "user playing song" data every few seconds.
- Stream the data into a simple database (like SQLite).
- Process the data live to track top songs or artists.
- Visualize the results in Power BI or a dashboard.

2. Lyrics Sentiment Live Tracker

Description:
Track the emotional tone of songs in real-time by analyzing new lyrics as they come in.

What I Will Do:

- Simulate or fetch new song lyrics every few seconds.
- Use Python and a sentiment tool (like TextBlob) to rate lyrics (happy, sad, etc.).
- Store the results in a database.
- Build a live chart to show mood trends in music.

3. Car Price Drop Notifier

Description:
Simulate monitoring car listings from an online marketplace. Notify when a car's price drops.

What I Will Do:

- Create a script that generates or scrapes car data (make, model, price).
- Compare current price with previous ones.
- Alert or log when a price drops significantly.
- Store data for tracking price trends.

4. Vehicle Telematics Stream Simulator

Description:
Create a real-time stream of car sensor data (like speed, GPS, fuel level), similar to smart vehicle tracking.

What I Will Do:

- Simulate real-time driving data using Python (new data every 1–2 seconds).
- Store data in a JSON file or MongoDB database.
- Analyze patterns such as high speed or low fuel.
- Build a simple dashboard to show car movement or usage.

5. BPM Stream Analyzer

Description:
As new songs come in, automatically calculate their tempo (beats per minute) and store the results live.

What I Will Do:

- Simulate uploading or receiving new songs.
- Use Python and Librosa to extract the BPM.
- Save song name, artist, and BPM in a database.
- Build a live graph comparing tempos by genre or artist.