

Uber Trip Analysis – SQL-Driven Business Intelligence Project

Project Overview

This project focuses on solving real-world business problems using **SQL** and presenting insights through an **interactive Power BI dashboard**. The dataset contains Uber trip-level data including booking details, locations, time, payment methods, vehicle types, distance, and revenue.

The workflow follows an end-to-end analytics approach: 1. Business problem identification 2. SQL-based analysis to answer business questions 3. Visualization and storytelling using Power BI

This repository demonstrates strong skills in **SQL querying, business analysis, and dashboard design**.

Business Objective

The main business objectives are:

- Understand booking and revenue trends
- Identify high-demand time periods and locations
- Analyze customer behavior and payment preferences
- Optimize vehicle allocation and operational strategy
- Support data-driven decision-making

Datasets Used

1. Uber Trip Details Table

Contains trip-level transactional data.

Key Columns: - Trip_ID - Vehicle_Type - Payment_Type - Booking_Amount - Pickup_Date - Pickup_Time - Trip_Distance - Pickup_Location_ID - Dropoff_Location_ID - Number_of_Passengers

2. Location Table

Maps location IDs to geographic details.

Key Columns: - Location_ID - Zone - Borough - Service_Zone

Data Preparation

- Cleaned null and duplicate records
- Converted date and time fields into proper formats

- Created derived columns (Hour, Day Name, Month)
 - Joined Trip table with Location table using Location_ID
 - Validated booking amount and trip distance ranges
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Business Questions Solved Using SQL

Booking & Revenue Analysis

1. What is the total number of bookings?
2. What is the total booking value (revenue)?
3. What is the average booking value per trip?
4. How does booking value vary by day of the week?
5. What are the top 5 revenue-generating days?

Time-Based Analysis

1. Which hour of the day has the highest booking value?
2. What are peak booking hours for weekdays vs weekends?
3. How does demand vary between day trips and night trips?
4. What is the average trip duration by hour?
5. Which day-hour combination generates maximum revenue?

Location Analysis

1. What are the most frequent pickup locations?
2. What are the most frequent drop-off locations?
3. Which locations generate the highest booking value?
4. What is the longest trip recorded and between which locations?
5. Which locations show consistently high demand?

Vehicle & Payment Analysis

1. Which vehicle type has the highest number of bookings?
 2. Which vehicle type generates the highest revenue?
 3. What is the average booking value by vehicle type?
 4. What is the distribution of payment methods?
 5. Which payment type contributes the most revenue?
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SQL Approach (High Level)

- Aggregate functions (SUM, COUNT, AVG)
- GROUP BY for segmentation analysis
- CASE statements for day/night and peak/off-peak classification
- Date and time functions for time-series analysis
- ORDER BY and LIMIT for ranking insights

All business questions were first answered using **SQL queries**, and the results were later validated and visualized in Power BI.

Dashboard Overview (Power BI)

1. Overview Analysis Page

- KPI cards: Total Bookings, Total Revenue, Avg Booking Value, Total Distance
- Booking trends by day
- Payment type and trip type (Day/Night) distribution
- Vehicle-wise booking and revenue analysis

2. Time Analysis Page

- Booking value by pickup hour
- Day-wise and hour-wise heatmap
- Revenue trends across weekdays and weekends
- Peak and off-peak demand visualization

3. Details Page

- Trip-level transactional table
 - Filters for date, vehicle type, payment method, and location
 - Drill-down capability for deeper analysis
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Key Insights

- Peak revenue occurs during late afternoon and evening hours
 - Weekends generate higher booking value than weekdays
 - UberX dominates both bookings and revenue
 - Digital payment methods outperform cash payments
 - Certain locations consistently act as demand hotspots
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Business Impact

- Helps optimize driver allocation during peak hours
 - Supports pricing and promotional strategy decisions
 - Improves understanding of customer behavior
 - Enables operational planning using data-driven insights
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Tools & Technologies

- SQL (Data Analysis)
 - Power BI (Visualization & Dashboarding)
 - Power Query (Data Transformation)
 - Microsoft Excel (Source Data)
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Conclusion

This project demonstrates the ability to translate raw data into meaningful business insights using **SQL** and communicate findings effectively through **Power BI dashboards**. It reflects practical analytics skills aligned with real business requirements.