Power-BI Project

Step 1: UNDERSTAND DATA

This project focuses on analyzing Uber trip data using two simple tables:

1. **Trips Table**
   This table contains details of each ride, including trip ID, pickup and drop-off times, number of passengers, distance, pickup and drop-off locations, fare amount, surge fee, vehicle type, and payment method.
2. **Locations Table**
   This table helps identify the actual area and city by matching the location IDs from the trips table.

By using these two tables, we aim to understand ride patterns, peak travel times, popular pickup and drop-off areas, fare trends, and the effect of surge pricing. The goal is to create clear and useful insights through visuals and dashboards for better understanding of Uber's operations.

STEP 2 : KNOW BUSINESS REQUIREMENTS

LINK –

STEP 3 : CLEAN, TRANSFORM AND LOAD

Load the Data	**Go to Home > Get Data → choose your source (Excel, CSV, etc.)** **Load both tables: Trips and Locations**
Enable Data Quality Insights	**Before load click transform option** **Power query >> View tab >> click on Column distribution, Column quality, Column Profile** **Column Quality – to see valid, empty, and error values** **Column Distribution – to view data variety and common values.** **Column Profile – to see stats like min, max, average, and frequent values.** **/**
Remove Unwanted Columns	**Use "Remove Columns" to delete any unnecessary columns**
Rename Columns	**Give readable names to fields**
Handle Missing or Invalid Data	**Use Remove Rows > Remove Blank Rows or Remove Errors.** **Use Column Quality to see where nulls or errors are present**
Change Data Types	**Transform > Data Type** • **Set Pickup Time & Drop Off Time → Date/Time** • **Set fare_amount, trip_distance, Surge Fee → Decimal Number** • **Set passenger_count → Whole Number**
Remove Duplicates	**Go to Remove Rows > Remove Duplicates (usually by Trip ID)**
Final Review	**Check Column Quality bars to ensure no errors/nulls remain** **Use Column Distribution to validate value spread** **Use Column Profile for key columns like:** • **fare_amount, trip_distance, Trip Duration, Pickup Area, Payment_type**
Load to Power BI	**Home >> Close & Apply**

STEP 4 : DATA MODELLING

We have two tables and first we have to do data modelling

Understand the Tables **Trips Table: Contains PULocationID and DOLocationID (pickup and drop-off location IDs).** **Locations Table: Contains unique LocationID, Location, and City.**
Open Manage Relationships **Go to Model view or use Home > Manage Relationships.** **Click on "New" to create a new relationship.**
Create First Relationship (Pickup Location) **From: Trip Details → PULocationID** **To: Locations → LocationID** **Relationship: Many-to-One (many trips can share the same location) & Set this as the Active relationship.** **Direction: Single (filters flow from Locations → Trips)** **Star (★) = Many side; 1 = One side**
Create Second Relationship (Drop-off Location) • **From: Trip Details → DOLocationID** • **To: Locations → LocationID** • **Relationship: Many-to-One again** • **This will be created as an Inactive relationship (shown as dotted line)**
The **inactive** one needs to be activated using DAX functions like:

STEP 5 : Create a Calendar Table and Build Data Model

Why Calendar Table is Important

- **Needed for time-based visuals (e.g., bookings per day)**
- **Best practice in Power BI for accurate time intelligence**
- **Allows use of built-in time functions (e.g., TOTALYTD, SAMEPERIODLASTYEAR)**

Extract Date from Pickup Time	**Go to Data view** • **Right-click on Trip Details table → New Column** • **Create a column named Pickup Date:** **Pickup Date = DATE(YEAR(TripDetails[Pickup Time]), MONTH(TripDetails[Pickup Time]), DAY(TripDetails[Pickup Time]))** • **Change data type to Date (not Date/Time) in Column Tools**
Create the Calendar Table	**Go to Table Tools > New Table** • **Use the CALENDAR function:** **CalendarTable = CALENDAR(MIN(TripDetails[Pickup Date]), MAX(TripDetails[Pickup Date]))** • **This generates a list of all dates between the earliest and latest Pickup Date** • **Change column data type to Date (remove time)**
Create Relationship (Calendar → Trips)	**Go to Model View** **Drag CalendarTable[Date] to TripDetails[Pickup Date]**

Understand the Relationship

- **CalendarTable[Date] → One (1)**
- **TripDetails[Pickup Date] → Many (*)**
- **This enables time-based analysis (daily trends, monthly trips, etc.)**

Star Schema Structure

- **Final model now includes:**
  - **Fact Table: TripDetails**
  - **Dimension Tables: Locations, CalendarTable**
- **This forms a Star Schema, which is ideal for reporting**

STEP 6 : DASHBOARD CREATION

Canvas and Dashboard Styling Setup

1. **Go to View > Canvas Settings**

Page Size	**Set: Width: 1600 px &Height: 900 px**
Vertical Alignment	**Middle**
Canvas Background	**Choose "20% Darker" theme** **Adjust Transparency to 75**

Insert Sidebar Placeholder

1. **Insert → Shape → Rectangle**
2. **Adjust: Height: Full page, Width: 4 px , Position: Align to left**
3. **Style: Fill color: Black & Use as placeholder for logos/icons**

Add Dashboard Title

Insert → Text Box:
Text: Uber Trip Analysis | Overview Analysis

- **Font: Segoe UI Bold / Segoe UI SemiBold**
- **Size: Main title: 28, Subtitle: 20**
- **Color: Main title: Black and Subtitle: Blue**

Remove background of text box under "Effects"

Create KPI Measures in Power BI

Total Bookings	**Total Bookings = COUNT(TripDetails[Trip ID])**
Total Booking Value	**Total Booking Value = SUM(TripDetails[fare_amount]) + SUM(TripDetails[Surge Fee])**
Average Booking Value	**Average Booking Value = DIVIDE([Total Booking Value], [Total Bookings], BLANK())**
Total Trip Distance	**Total Trip Distance =** **VAR TotalMiles = SUM(TripDetails[trip_distance]) / 1000** **RETURN CONCATENATE(FORMAT(TotalMiles, "0"), "k miles")**
Average Trip Distance	**Average Trip Distance =** **VAR AvgMiles = ROUND(AVERAGE(TripDetails[trip_distance]), 0)** **RETURN CONCATENATE(AvgMiles, " miles)**

Average Trip Time	Average Trip Time = VAR AvgTime = AVERAGEX(TripDetails, DATEDIFF(TripDetails[Pickup Time], TripDetails[Drop Off Time], MINUTE)) RETURN CONCATENATE(FORMAT(AvgTime, "0"), " minutes")

Create and Format KPI Cards

1.Enable New Card Visual (if not available):

- **File → Options → Preview Features → Check "New Card Visual" → Restart Power BI**

2.Insert New Card Visual:

- **Drag all six measures into one card visual**

3.Format the card:

- **Size: Height = 120, Width = 1415**
- **Spacing Between Cards: 15**
- **Maximum Cards Displayed: 6**
- **Font: Segoe UI Bold, Size: 25, Alignment: Center**
- **Label Font: Font: Segoe UI SemiBold, Size: 11, Color: Gray/Accent**
- **Border: Color: #666666, Width: 1 px**
- **Accent Bar:Enable, Color: Black, Width: 5**
- **Card Shape:Rounded rectangle, Corner radius: 5**

Tips : To change values according to US

- **Add $ for currency fields like Booking Value**
- **Add miles and minutes for units in trip distance/time**
- **Use FORMAT or ROUND functions for better control on numeric display**
- **Use concatenation for showing units next to values**

INTERACTIVE DONUT CHARTS WITH DYNAMIC MEASURE SELECTOR

Create Dynamic Measure Selector Parameter

1. **Go to Modeling tab.**
2. **Click "New Parameter" → "Fields".**
3. **Name it: Dynamic Measure.**
4. **Select these three fields to include: Total Bookings, Total Booking Value, Total Trip Distance Measure**
5. **Click Create.**

This creates a parameter table and a slicer that lets users toggle between the three metrics.

Add a Slicer for Measure Selection

1. **Drag Dynamic Measure[Dynamic Measure] into a slicer visual.**
2. **Format the slicer:**
    - **Slicer Settings: Single select**
    - **Font size: 12 pt**
    - **Font style: Segoe UI Semibold**
    - **Color: Black**
    - **Remove slicer header (optional)**
3. **Place it above or beside the donut chart placeholder.**

Create a Shape Placeholder for Donut Charts

1. **Go to Insert > Shapes > Rounded Rectangle.**
2. **Set Height: 325, Width: 700.**
3. **In Shape Properties:**
    - **Rounded corners: 2%**
    - **Fill color: White**
    - **Border: #666666 (dark gray)**
4. **Align this shape to the left section of the page as a background.**

Bring Measure Selector in Front

1. **Select the background shape.**
2. **Go to Format > Send Backward → this brings the slicer in front of the shape.**
3. **Adjust the slicer to fit well inside the shape.**

You will create 2 donut charts:

A. Donut Chart by Payment Type

1. **Add a Donut Chart visual.**
2. **Values: Selected Measure**
3. **Legend: Payment Type**
4. **Adjust position inside the shape.**
5. **Format:**
    - **Labels: Visible**
    - **Title: Off (optional if adding your own title)**
    - **Legend position: Right or bottom**
    - **Color code segments clearly**

Create Donut Chart (By Trip Time: Day vs Night)

1. **Add new calculated column:**

```
Trip Time Category =
VAR HourOfDay = HOUR(Trips[Pickup Time])
RETURN IF(
   HourOfDay >= 17 || HourOfDay < 6,
   "Night",
   "Day"
)
```

2. **Use this column in another donut chart.**
3. **Legend: Trip Time Category, Values: Selected Measure**
4. **Format same as above.**

The measure Total Trip Distance you were using had a CONCATENATE function, which converts the numeric value to a text string (e.g., "5000 miles").

Write a new DAX formula without concatenate:

Total Trip Distance Measure = SUM(Trips[Trip Distance])

Then Update the Dynamic Measure Switch

("Total Trip Distance Measure", NAMEOF('Trip Details'[Total Trip Distance Measure]), 2)

Vehicle Type Analysis (Grid View)

Step 1: Create Matrix Table

1. **Insert > Matrix visual**
2. **Rows: Vehicle Type**
3. **Values:**
   - **Total Bookings**
   - **Total Booking Value**
   - **Average Booking Value**
   - **Total Trip Distance Measure**

Step 2: Format the Matrix

- **Font size:**
  - **Row headers: 14, semi-bold**
  - **Column headers: 11, semi-bold**
  - **Values: 13, semi-bold**
- **Turn off Subtotals**
- **Grid:**
  - **Horizontal lines: White, Width: 10**
  - **No vertical lines**
- **Alignment: Center all values**
- **Decimal Places: 0 for all columns**

Step 3: Add Static Images of Vehicle Types 1. Insert > Image 2. Add images (Uber X, Uber XL, Uber Green, etc.) 3. Align all to center using Format > Align > Align Center	**Step 4: Add Conditional Formatting** 1. Select column: Total Bookings 2. Apply: Data Bars (Positive) 3. Color of bars and axis: Grey
Step 5: Add Title 1. Create a new measure: Vehicle Title = "Vehicle Type Analysis" 2. Add a Card visual to display the title. Font: Semi-bold, size 12	**Format Column Display Units** Go to Specific Columns under Format: Set Decimal places to 0 for: Total Bookings , Total Booking Value, Average Booking Value , Total Trip Distance Set Text Alignment to Center for all columns

AREA CHART

Add a Background Shape

1. Copy any existing rectangular shape used for layout → Ctrl + C, then Ctrl + V.
2. Go to Format > General > Properties:
    - Set Height to 185
    - Set Width to 680
3. Move it using arrow keys to the right position, aligning it cleanly with the rest of your visuals.

Insert the Area Chart From Visualizations, select Area Chart. Drag it onto the newly added background shape.	**Add Data to Area Chart** 1. From your Calendar Table, drag Day from Date Hierarchy into the X-axis. Drag Total Bookings into the Y-axis.

Format the Area Chart
Axis Settings:
• Go to Format Visual > X-Axis:
  ○ Turn Title OFF
• Go to Y-Axis:
  ○ Turn Title OFF
  ○ Optional: You can keep values ON if you want to show actual numbers
	Gridlines:
	• Go to Gridlines:
	  ○ Turn OFF both X and Y gridlines
	Lines:
	• Go to Lines section:
	  ○ Enable Smooth Line
	  ○ Set Color: Black (or your theme color)

Shaded Area: • Go to Shaded Area: ○ Set Transparency to 85%	**Resize & Position the Chart** • Resize the area chart to fit neatly inside the placeholder shape • Ensure labels and lines are readable