

Uber Supply Demand Gap

Project By: Siddhi Wagh

Project Summary

This project focuses on analysing Uber ride request data to identify and address key operational challenges related to driver availability, trip cancellations, and unfulfilled ride requests. The dataset includes crucial variables such as request timestamps, pickup points (city or airport), driver IDs, trip status, and drop timestamps. The findings will serve as a foundation for data-driven recommendations to improve service efficiency, balance supply with demand, reduce cancellations, and enhance the overall customer experience. The project ultimately supports Uber's goal of optimizing its operations through actionable insights derived from its own ride data.

The insights derived will help inform strategic decisions to:

- Improve customer experience
- Reduce service gaps during peak hours
- Optimize driver deployment
- Minimize ride cancellations

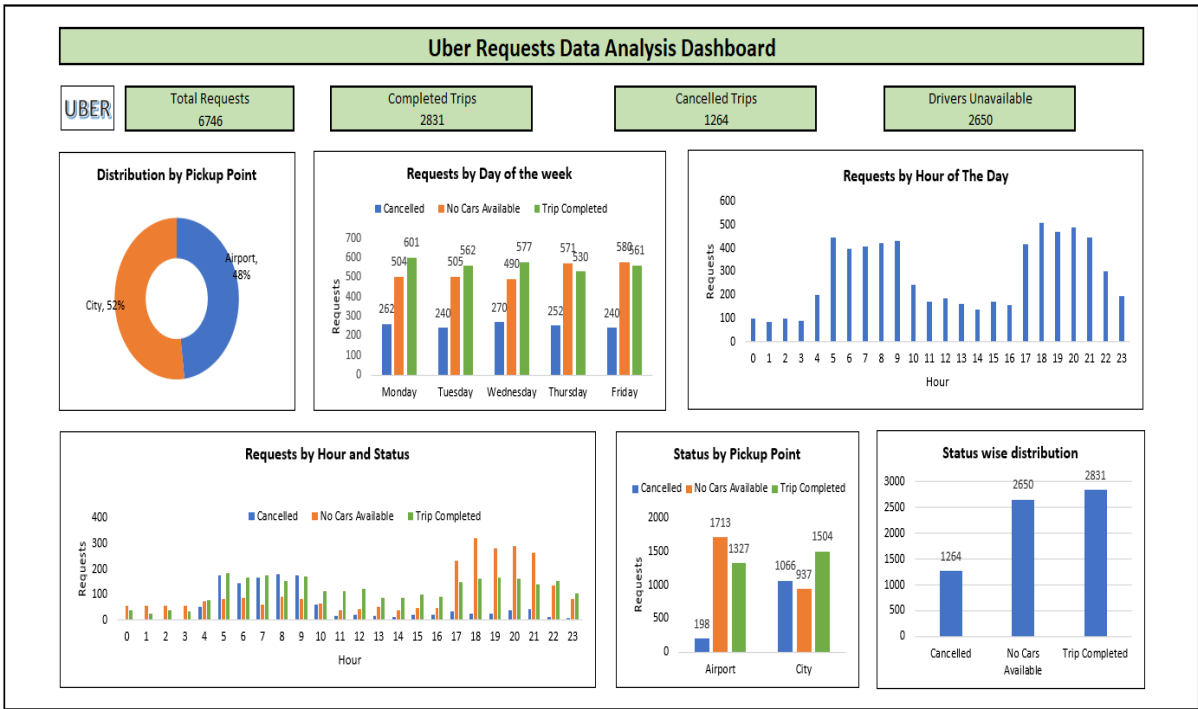
Business Objective

To analyze Uber ride request data in order to identify trends in demand and driver availability, understand service failures, and provide data-driven recommendations to enhance operational efficiency, increase trip fulfilment, and reduce cancellations.

Tools & Technologies used:

- Excel
- SQL
- Python
- Pandas
- NumPy
- Matplotlib
- Seaborn
- Jupyter Notebook

Dashboard Using Excel:



Queries in SQL:

```
1
2 • SELECT * FROM labmentix.`uber request data`;
```

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Result Grid Filter Rows: Search Export: Fetch rows:

Request id	Pickup point	Driver id	Status	Request timestamp	Drop timestamp
619	Airport	1	Trip Completed	11/7/2016 11:51	11/7/2016 13:00
867	Airport	1	Trip Completed	11/7/2016 17:57	11/7/2016 18:47
1807	City	1	Trip Completed	12/7/2016 9:17	12/7/2016 9:58
2532	Airport	1	Trip Completed	12/7/2016 21:08	12/7/2016 22:03
3112	City	1	Trip Completed	13-07-2016 08:33:16	13-07-2016 09:25:47
3879	Airport	1	Trip Completed	13-07-2016 21:57:28	13-07-2016 22:28:59
4270	Airport	1	Trip Completed	14-07-2016 06:15:32	14-07-2016 07:13:15
5510	Airport	1	Trip Completed	15-07-2016 05:11:52	15-07-2016 06:07:52
6248	City	1	Trip Completed	15-07-2016 17:57:27	15-07-2016 18:50:51
267	City	2	Trip Completed	11/7/2016 6:46	11/7/2016 7:25
1467	Airport	2	Trip Completed	12/7/2016 5:08	12/7/2016 6:02
1983	City	2	Trip Completed	12/7/2016 12:30	12/7/2016 12:57
2784	Airport	2	Trip Completed	13-07-2016 04:49:20	13-07-2016 05:23:03
3075	City	2	Trip Completed	13-07-2016 08:02:53	13-07-2016 09:16:19
3379	City	2	Trip Completed	13-07-2016 14:23:02	13-07-2016 15:35:18
3482	Airport	2	Trip Completed	13-07-2016 17:23:18	13-07-2016 18:20:51
4652	City	2	Trip Completed	14-07-2016 12:01:02	14-07-2016 12:36:46
5335	Airport	2	Trip Completed	14-07-2016 22:24:13	14-07-2016 23:18:52
535	Airport	3	Trip Completed	11/7/2016 10:00	11/7/2016 10:31
960	Airport	3	Trip Completed	11/7/2016 18:45	11/7/2016 19:23
1934	Airport	3	Trip Completed	12/7/2016 11:17	12/7/2016 12:23
2083	Airport	3	Trip Completed	12/7/2016 15:46	12/7/2016 16:40
2211	Airport	3	Trip Completed	12/7/2016 18:00	12/7/2016 18:28
3096	Airport	3	Trip Completed	13-07-2016 08:17:29	13-07-2016 09:22:37
3881	Airport	3	Trip Completed	13-07-2016 21:54:18	13-07-2016 22:51:23
5254	City	3	Trip Completed	14-07-2016 21:23:03	14-07-2016 22:25:19
5434	City	3	Trip Completed	15-07-2016 02:41:38	15-07-2016 03:24:43

uber request data 1

```
6 • SELECT COUNT(*) AS Total_Requests
7 FROM labmentix.`uber request data`;
8
9
```

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Result Grid Filter Rows: Search Export:

Total_Requests
4095

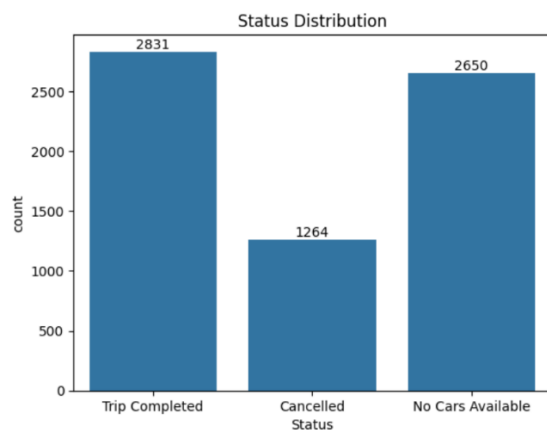
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4 • SELECT Status, COUNT(*) As Total
5 FROM labmentix.`uber request data`
6 GROUP BY Status;
7
```

100% 1:3 1 error found

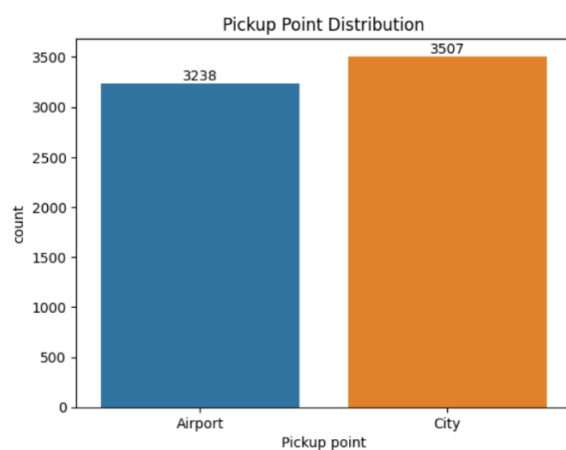
Result Grid Filter Rows: Search Export:

Status	Total
Trip Completed	2831
Cancelled	1264

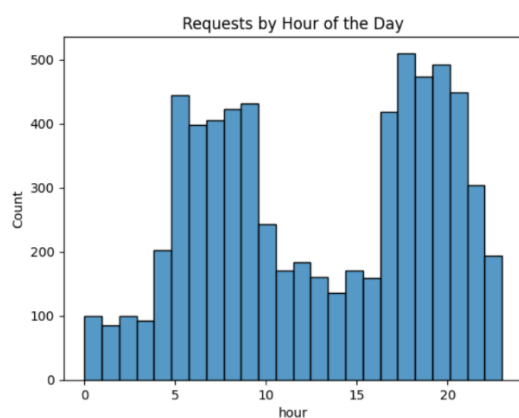
Data Visualizations using Python:



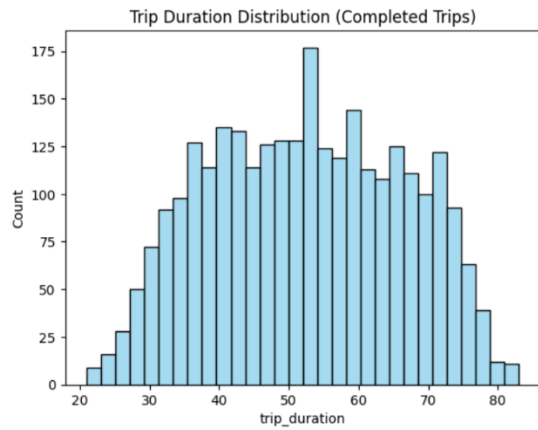
From the above graph we can see that while 2831 trips were completed, 1264 trips were cancelled by drivers and there were no cars available for 2650 requests out of total.



Out of total, there are 3238 requests for airport pickup and 3507 for city, making it more requests for airport rather than city.



Most requests occur during 18 hrs to 22 hrs, indicating higher activity around that time of day.



There are very few trips lasting between 10 and 35 minutes. There's a sharp increase in frequency between 40 and 60 minutes, indicating that longer trips are relatively rare. This suggests that the service is mostly used for medium-distance travel.

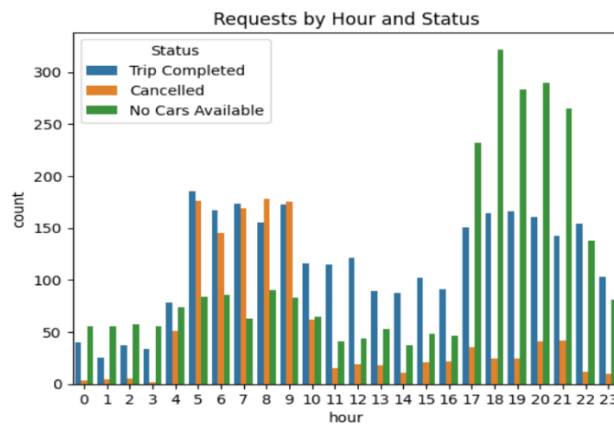
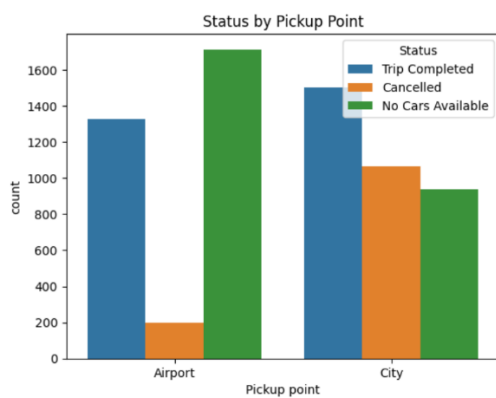
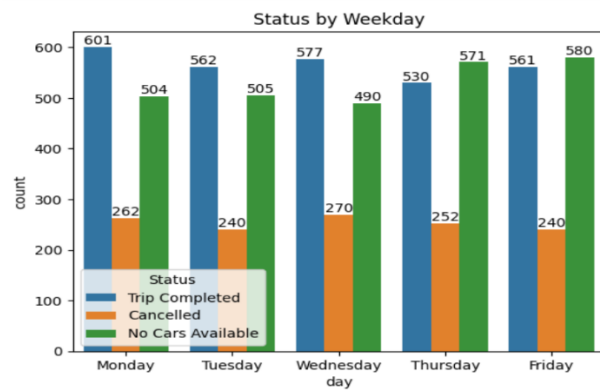


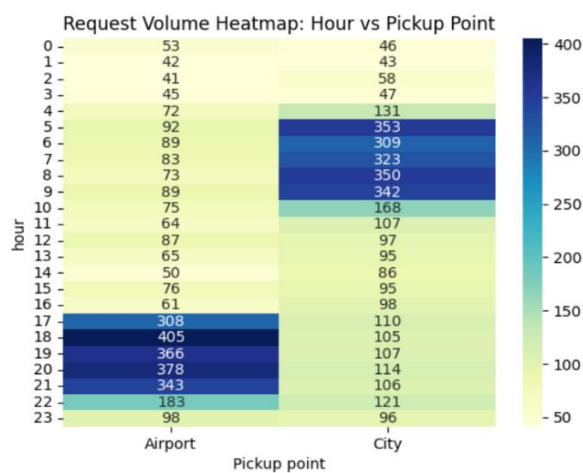
Chart shows that between 5am and 9am most rides were cancelled, whereas between 17hrs and 21hrs there was a shortage of drivers.



This chart shows that Airport has the large number of cars unavailable or driver's shortages whereas for City trips large number of customers have cancelled the ride requests.



It is clear from the chart that Friday had highest unavailability of cars and lowest cancellations. Most trips were completed on Monday and least on Thursday.



This chart shows that Airport has the highest demand for rides at 6pm with 405 requests whereas most rides for city are at 5 am with 353 requests.

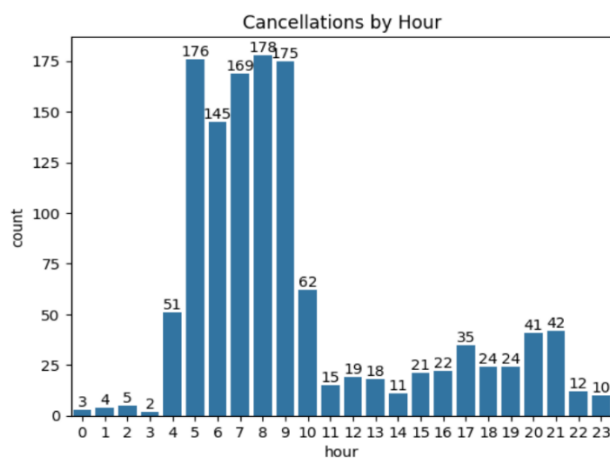
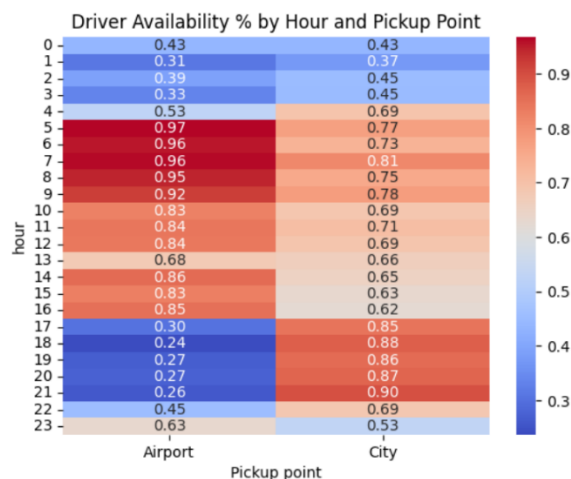


Chart shows that most customers have cancelled the rides between 5 am and 9am, possibly due to delays.



Heat map chart highlights the areas and times with poor driver availability. Chart shows that Airport had the poorest driver availability at 9 pm whereas highest at 5am. For City ride requests, only 37% driver availability at 1 am and 90% driver availability at 9 pm.

Key Insights:

- There is a clear mismatch between demand and driver availability.
- There are more requests for airport pickups than city trips, and a high percentage of unfulfilled airport requests due to no cars being available.
- Many rides are cancelled by customers between 5 AM and 9 AM, likely due to delays or unavailability.
- Trip durations are longer during early morning and evening peaks.

Solution to Business Objective:

1. Increase driver availability during peak hours, especially early morning and late evening, with focused deployment at airports.
2. Allocate more drivers to airport locations during high-demand hours, particularly 6 PM and 9 PM, to capitalize on missed revenue.
3. Offer scheduled ride options to build customer confidence.

Conclusion:

By aligning driver availability with demand patterns, focusing on airport ride optimization, and enhancing customer experience in peak hours, the business can reduce cancellations, increase completed trips, and improve profitability. Leveraging detailed insights from temporal and geographical data will ensure more efficient operations and better customer satisfaction.