**PROJECT NAME : UBER SERVICE GAPS AND RIDE PERFORMANCE ANALYSIS**

**Project Type : Exploratory Data Analysis (EDA) using SQL**

**Contribution : Individual**

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**Problem Statement**

Inconsistent driver availability and varying ride demand patterns often create gaps in Uber’s service fulfillment. This project aims to analyze these patterns using SQL to uncover trends in cancellations, no-availability issues, and supply-demand mismatches across time and pickup points. The goal is to generate actionable insights to improve operational efficiency and customer satisfaction.

**Project Objectives**

* To analyze Uber ride request data using SQL and identify trends in demand and driver availability.
* To evaluate cancellation patterns and no-car-availability events across different time periods and pickup locations.
* To detect supply-demand gaps that impact ride completion rates.
* To support data-driven decision-making for optimizing driver incentives, shift planning, and service quality improvements.

**Project Summary**

This project, titled “Uber Service Gaps and Ride Performance Analysis Using SQL”, was designed to systematically examine patterns within Uber’s ride request data. The goal was to leverage SQL queries to uncover key insights into when and where Uber’s service performance experiences gaps — with particular attention to ride cancellations and no-car-availability events.

The dataset analyzed consists of over 6700 Uber ride records, each containing details such as pickup point, ride status, timestamps, and driver information. The data was first cleaned and imported into MySQL. A series of well-structured SQL queries were developed to explore various dimensions of the service — including overall ride outcomes, hourly demand trends, cancellation behavior, no-availability patterns, and supply-demand mismatches by location.

Through this analysis, several important trends emerged. Firstly, the overall ride status summary provided a clear picture of service reliability, showing how many rides were successfully completed versus cancelled or unfulfilled due to lack of available drivers. Understanding this balance gave an immediate sense of the platform’s operational strengths and weaknesses.

The hourly demand and fulfillment query revealed how rider requests fluctuated throughout the day. By comparing total requests against completed trips, it became evident that certain times of day — such as early mornings or late nights — presented higher challenges in matching supply with demand. These insights highlight opportunities to improve driver availability during under-served periods.

A focused analysis on ride cancellations by hour uncovered behavioral patterns among drivers and passengers. Spikes in cancellations often align with inconvenient time slots or operational inefficiencies, indicating areas for targeted improvement — whether through driver incentives or better scheduling.

Perhaps most revealing was the examination of "No Cars Available" events, which clearly mapped Uber’s supply-demand gaps by time. Identifying the hours with the highest frequency of unmet demand equips Uber with actionable data to optimize driver distribution and adjust service strategies.

Further analysis specifically targeting the Airport and City pickup points showed distinct differences in ride patterns between these zones. The Airport often showed concentrated demand surges tied to flight schedules, while the City exhibited more consistent demand but varying service reliability across different times.

Lastly, calculating cancellation percentages by pickup point provided additional insights into service quality variances between zones, supporting more nuanced operational planning.

Overall, this project demonstrates how SQL-based data analysis can deliver powerful operational insights into ride-hailing platforms like Uber. The findings can be used to inform driver engagement strategies, dynamic pricing models, and operational adjustments — all aimed at improving service reliability, increasing ride completion rates, and enhancing the overall customer experience.

**SQL Analysis Code**

CREATE DATABASE uber\_project;

USE uber\_project;

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***-- Table Schema***

CREATE TABLE uber\_data (

request\_id INT,

pickup\_point VARCHAR(50),

driver\_id INT NULL,

status VARCHAR(50),

request\_timestamp DATETIME,

drop\_timestamp DATETIME NULL

);

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**-- 1. Overall Ride Status Summary**

SELECT status, COUNT(\*) AS ride\_count

FROM uber\_data

GROUP BY status

ORDER BY ride\_count DESC;

**-- Output 1**

|  |  |
| --- | --- |
| **status** | **ride\_count** |
| Trip Completed | 2831 |
| No Cars Available | 2650 |
| Cancelled | 1264 |

**Query Insights :**

The Overall Ride Status Summary offers a snapshot of how effectively Uber is able to meet ride requests across the entire dataset. This query groups all rides into three key status outcomes:

* Trip Completed — successfully served rides
* Cancelled — rides cancelled by either driver or customer
* No Cars Available — requests that could not be fulfilled due to no drivers being available

By analyzing the distribution of these statuses, we can evaluate the overall efficiency of the service. A high percentage of 'Trip Completed' indicates that Uber’s supply of drivers is generally sufficient to meet demand. Conversely, significant percentages of 'Cancelled' or 'No Cars Available' suggest gaps in availability or operational challenges.

If the data shows that a large majority of rides are being completed (for example, more than 70%), it would imply a relatively stable and effective service model. However, if cancellations are frequent, it could indicate that drivers are rejecting certain trips — possibly due to timing, location, or fare-related reasons. Similarly, a high occurrence of "No Cars Available" reveals periods or areas where Uber lacks sufficient active drivers to match customer demand.

Understanding this balance is crucial in identifying potential areas of service improvement. It helps in making informed decisions about driver recruitment, dynamic pricing, incentives, and customer experience enhancements. This summary sets the foundation for deeper insights that will be explored in subsequent queries — such as identifying peak demand hours, pinpointing the times and locations where cancellations and service gaps are most pronounced, and examining patterns in ride availability.

**-- 2. Supply vs Demand — by Hour of Day**

SELECT

HOUR(request\_timestamp) AS hour\_of\_day,

COUNT(\*) AS total\_requests,

SUM(CASE WHEN status = 'Trip Completed' THEN 1 ELSE 0 END) AS completed\_trips

FROM uber\_data

GROUP BY hour\_of\_day

ORDER BY hour\_of\_day;

**-- Output 2**

|  |  |  |
| --- | --- | --- |
| hour\_of\_day | total\_requests | completed\_trips |
| 0 | 99 | 40 |
| 1 | 85 | 25 |
| 2 | 99 | 37 |
| 3 | 92 | 34 |
| 4 | 203 | 78 |
| 5 | 445 | 185 |
| 6 | 398 | 167 |
| 7 | 406 | 174 |
| 8 | 423 | 155 |
| 9 | 431 | 173 |
| 10 | 243 | 116 |
| 11 | 171 | 115 |
| 12 | 184 | 121 |
| 13 | 160 | 89 |
| 14 | 136 | 88 |
| 15 | 171 | 102 |
| 16 | 159 | 91 |
| 17 | 418 | 151 |
| 18 | 510 | 164 |
| 19 | 473 | 166 |
| 20 | 492 | 161 |
| 21 | 449 | 142 |
| 22 | 304 | 154 |
| 23 | 194 | 103 |

**Query Insights :**

This query analyzes the relationship between ride demand and supply fulfillment by breaking down requests hour by hour. By grouping ride requests by the hour of the day, we can observe when customer demand peaks and how well Uber is able to serve that demand at different times.

The column total\_requests indicates customer demand — how many rides were requested during each hour. The column completed\_trips shows how many of those requests were successfully fulfilled.

By comparing these two values, we can easily spot patterns:

* During which hours does Uber see high demand?
* Is there any time period where the demand is rising but completed trips do not keep up?
* Are there any gaps between demand and supply?

Typically, we expect demand to peak during certain hours — such as morning commute times (7–10 AM), evening commute (5–9 PM), and late-night weekends. If we observe that the number of completed trips drops sharply during any period of high demand, this suggests that Uber’s driver supply is falling short at those times.

Conversely, periods where the number of completed trips closely matches total demand indicate a healthy balance between rider needs and driver availability.

This insight is essential for operational planning. For example, if supply consistently lags during morning hours, Uber can consider offering incentives to encourage drivers to be active during those times. Similarly, if late-night hours show a persistent gap, driver schedules can be optimized to boost coverage.

Ultimately, this hourly breakdown enables Uber to fine-tune both driver deployment and customer experience by aligning supply more closely with demand — improving ride completion rates and reducing customer frustration during peak hours.

**-- 3. Cancellations — by Hour of Day**

SELECT

HOUR(request\_timestamp) AS hour\_of\_day,

COUNT(\*) AS total\_requests,

SUM(CASE WHEN status = 'Cancelled' THEN 1 ELSE 0 END) AS cancelled\_rides

FROM uber\_data

GROUP BY hour\_of\_day

ORDER BY hour\_of\_day;

**-- Output 3**

|  |  |  |
| --- | --- | --- |
| **hour\_of\_day** | **total\_requests** | **cancelled\_rides** |
| 0 | 99 | 3 |
| 1 | 85 | 4 |
| 2 | 99 | 5 |
| 3 | 92 | 2 |
| 4 | 203 | 51 |
| 5 | 445 | 176 |
| 6 | 398 | 145 |
| 7 | 406 | 169 |
| 8 | 423 | 178 |
| 9 | 431 | 175 |
| 10 | 243 | 62 |
| 11 | 171 | 15 |
| 12 | 184 | 19 |
| 13 | 160 | 18 |
| 14 | 136 | 11 |
| 15 | 171 | 21 |
| 16 | 159 | 22 |
| 17 | 418 | 35 |
| 18 | 510 | 24 |
| 19 | 473 | 24 |
| 20 | 492 | 41 |
| 21 | 449 | 42 |
| 22 | 304 | 12 |
| 23 | 194 | 10 |

**Query Insights :**

This query focuses on analyzing ride cancellations across different hours of the day. Cancellations reflect scenarios where a ride was requested but ultimately not completed — either because a driver cancelled the trip, or in some cases the customer might have cancelled.

By calculating the total number of requests and the number of cancelled rides for each hour, we can identify patterns in driver or rider behavior. This helps answer important questions such as:

* During which hours are cancellations more frequent?
* Are there particular times of day where drivers are less willing to accept or complete rides?
* Is there any mismatch between when customers are requesting rides and when drivers are active?

An increase in cancellations during certain time windows may be influenced by various factors — such as traffic conditions, trip distance, driver availability, or even driver preferences for certain locations.

For instance, if cancellations spike during early morning hours (5–8 AM) or late-night hours, this could indicate that drivers are either unavailable or unwilling to operate during these shifts. Similarly, if cancellations occur during peak hours, it may suggest operational bottlenecks or issues with demand outpacing supply.

Ultimately, this analysis supports better service reliability — helping Uber balance supply with demand and reduce the negative impact of ride cancellations on both drivers and passengers.

**-- 4. No Cars Available — by Hour of Day**

SELECT

HOUR(request\_timestamp) AS hour\_of\_day,

COUNT(\*) AS total\_requests,

SUM(CASE WHEN status = 'No Cars Available' THEN 1 ELSE 0 END) AS no\_cars

FROM uber\_data

GROUP BY hour\_of\_day

ORDER BY hour\_of\_day;

**-- Output 4**

|  |  |  |
| --- | --- | --- |
| **hour\_of\_day** | **total\_requests** | **cancelled\_rides** |
| 0 | 99 | 56 |
| 1 | 85 | 56 |
| 2 | 99 | 57 |
| 3 | 92 | 56 |
| 4 | 203 | 74 |
| 5 | 445 | 84 |
| 6 | 398 | 86 |
| 7 | 406 | 63 |
| 8 | 423 | 90 |
| 9 | 431 | 83 |
| 10 | 243 | 65 |
| 11 | 171 | 41 |
| 12 | 184 | 44 |
| 13 | 160 | 53 |
| 14 | 136 | 37 |
| 15 | 171 | 48 |
| 16 | 159 | 46 |
| 17 | 418 | 232 |
| 18 | 510 | 322 |
| 19 | 473 | 283 |
| 20 | 492 | 290 |
| 21 | 449 | 265 |
| 22 | 304 | 138 |
| 23 | 194 | 81 |

**Query Insights :**

This query examines the number of ride requests that resulted in a “No Cars Available” status, hour by hour. This is a critical metric because it directly represents periods when Uber is unable to meet customer demand due to insufficient driver availability.

By grouping total ride requests and the number of “No Cars Available” cases by hour, we can identify supply shortfalls and pinpoint when Uber’s service capacity is weakest.

A high number of “No Cars Available” events during any particular time window highlights a clear supply-demand gap — meaning that customers are looking for rides but drivers are either offline or unavailable. Understanding these trends is important for multiple reasons:

* It helps Uber recognize peak demand periods where more driver coverage is needed.
* It uncovers off-peak times when driver incentives might help improve service availability.
* It highlights service reliability issues that can affect customer loyalty and app usage.

For example, if the data reveals that “No Cars Available” spikes during late-night hours or early mornings, it may indicate that driver coverage is too low during these shifts. Similarly, if the gap appears during weekend evenings or weekday rush hours, Uber may need to adjust driver incentives or onboarding efforts.

These insights are critical for operational decision-making. Addressing supply shortfalls in a proactive way helps ensure a more consistent and reliable experience for riders — reducing lost business opportunities and improving customer retention.

Monitoring the “No Cars Available” metric also supports driver workforce planning, allowing Uber to better match active driver supply with rider demand throughout the day.

**-- 5. Supply-Demand Gap at Airport — by Hour**

SELECT

HOUR(request\_timestamp) AS hour\_of\_day,

COUNT(\*) AS total\_requests,

SUM(CASE WHEN status = 'Trip Completed' THEN 1 ELSE 0 END) AS completed\_trips,

SUM(CASE WHEN status = 'No Cars Available' THEN 1 ELSE 0 END) AS no\_cars

FROM uber\_data

WHERE pickup\_point = 'Airport'

GROUP BY hour\_of\_day

ORDER BY hour\_of\_day;

**-- Output 5**

|  |  |  |  |
| --- | --- | --- | --- |
| **hour\_of\_day** | **total\_requests** | **completed\_trips** | **no\_cars** |
| 0 | 53 | 23 | 30 |
| 1 | 42 | 13 | 29 |
| 2 | 41 | 16 | 25 |
| 3 | 45 | 15 | 30 |
| 4 | 72 | 36 | 34 |
| 5 | 92 | 85 | 3 |
| 6 | 89 | 81 | 4 |
| 7 | 83 | 75 | 3 |
| 8 | 73 | 67 | 4 |
| 9 | 89 | 74 | 7 |
| 10 | 75 | 53 | 13 |
| 11 | 64 | 49 | 10 |
| 12 | 87 | 63 | 14 |
| 13 | 65 | 35 | 21 |
| 14 | 50 | 37 | 7 |
| 15 | 76 | 52 | 13 |
| 16 | 61 | 38 | 9 |
| 17 | 308 | 74 | 215 |
| 18 | 405 | 81 | 309 |
| 19 | 366 | 83 | 268 |
| 20 | 378 | 74 | 275 |
| 21 | 343 | 61 | 254 |
| 22 | 183 | 80 | 100 |
| 23 | 98 | 62 | 36 |

**Query Insights :**

This query focuses specifically on analyzing the supply-demand dynamics for rides requested from the Airport, broken down hour by hour.

The Airport is often a highly dynamic pickup location — with spikes in demand based on flight schedules, time of day, and passenger traffic. By grouping total ride requests, completed trips, and No Cars Available events for the Airport, we can pinpoint the hours where Uber is either meeting or falling short of demand in this key area.

The comparison between total requests and completed trips reveals how effectively Uber is serving airport passengers. When the number of “No Cars Available” entries is high — especially during peak hours — this reflects a service gap. Passengers are requesting rides, but there are not enough drivers present to fulfill the demand.

Common patterns might include:

* Low driver availability during late-night or early-morning flight arrivals
* Under-supply during weekend travel peaks
* Mismatch between flight schedules and driver shifts

This analysis helps Uber make informed decisions about driver incentives (for example, bonuses for drivers who serve airport pickups during certain hours), as well as driver scheduling — encouraging better coverage when flights arrive.

By reducing the supply-demand gap at the Airport, Uber can improve the experience for riders, reduce wait times, and increase revenue generated from this busy pickup point.

**-- 6. Supply-Demand Gap in City — by Hour**

SELECT

HOUR(request\_timestamp) AS hour\_of\_day,

COUNT(\*) AS total\_requests,

SUM(CASE WHEN status = 'Trip Completed' THEN 1 ELSE 0 END) AS completed\_trips,

SUM(CASE WHEN status = 'No Cars Available' THEN 1 ELSE 0 END) AS no\_cars

FROM uber\_data

WHERE pickup\_point = 'City'

GROUP BY hour\_of\_day

ORDER BY hour\_of\_day;

**-- Output 6**

|  |  |  |  |
| --- | --- | --- | --- |
| **hour\_of\_day** | **total\_requests** | **completed\_trips** | **no\_cars** |
| 0 | 46 | 17 | 26 |
| 1 | 43 | 12 | 27 |
| 2 | 58 | 21 | 32 |
| 3 | 47 | 19 | 26 |
| 4 | 131 | 42 | 40 |
| 5 | 353 | 100 | 81 |
| 6 | 309 | 86 | 82 |
| 7 | 323 | 99 | 60 |
| 8 | 350 | 88 | 86 |
| 9 | 342 | 99 | 76 |
| 10 | 168 | 63 | 52 |
| 11 | 107 | 66 | 31 |
| 12 | 97 | 58 | 30 |
| 13 | 95 | 54 | 32 |
| 14 | 86 | 51 | 30 |
| 15 | 95 | 50 | 35 |
| 16 | 98 | 53 | 37 |
| 17 | 110 | 77 | 17 |
| 18 | 105 | 83 | 13 |
| 19 | 107 | 83 | 15 |
| 20 | 114 | 87 | 15 |
| 21 | 106 | 81 | 11 |
| 22 | 121 | 74 | 38 |
| 23 | 96 | 41 | 45 |

**Query Insights :**

This query focuses on the supply-demand gap for rides originating from the City, broken down hour by hour. Unlike the Airport, the City generally experiences more steady, day-long ride requests influenced by daily routines — such as work commutes, social outings, and errands.

By examining total ride requests, completed trips, and No Cars Available rides, this analysis helps identify which periods of the day Uber is successfully meeting demand in the City — and which periods reveal gaps between rider demand and driver availability.

In many urban settings, demand tends to peak during morning rush hours (7 AM–10 AM), evening commute hours (5 PM–8 PM), and late-night periods (particularly on weekends). If the number of “No Cars Available” increases during any of these times, it signals an opportunity for Uber to improve driver coverage or provide incentives for drivers to be active in those hours.

On the other hand, if completed trips track well with total demand during these peak times, it shows that Uber’s current supply is well-aligned with customer needs in the City.

This analysis helps inform operational planning in two ways:

* Uber can adjust dynamic pricing or offer incentives during hours with unmet demand — motivating more drivers to be online.
* It supports driver recruitment and scheduling efforts — ensuring that driver shifts are better distributed across high-demand periods.

Ultimately, reducing the supply-demand gap within the City improves service consistency, enhances customer experience, and helps Uber maintain its market share in core urban areas.

**-- 7. Ride Requests by Pickup Point**

SELECT pickup\_point, COUNT(\*) AS total\_requests

FROM uber\_data

GROUP BY pickup\_point;

**-- Output 7**

|  |  |
| --- | --- |
| **pickup\_point** | **total\_requests** |
| Airport | 3238 |
| City | 3507 |

**Query Insights :**

This query provides a simple but important view of where the ride demand originates — by comparing the total number of requests coming from different pickup points (in this case: City vs Airport).

Understanding the distribution of requests between different pickup zones helps Uber:

* Allocate driver resources more effectively
* Adjust marketing strategies
* Optimize pricing for different locations

If the City generates the majority of ride requests — which is often expected due to the higher population density and day-long activity — Uber must ensure that driver availability remains strong across all city neighborhoods, especially during peak periods.

On the other hand, while the total number of Airport requests might be smaller compared to City, Airport rides are typically longer, higher-value trips — and can contribute significantly to revenue. Additionally, spikes in demand at the Airport often follow flight schedules, leading to short periods of very high demand that must be addressed.

This analysis also helps in driver scheduling:

* If demand from the City dominates, Uber can maintain a large pool of active drivers within the city center and surrounding neighborhoods.
* If Airport demand is significant (and often underserved), Uber may need to introduce targeted incentives to encourage drivers to accept Airport trips, or to wait at the Airport pickup zones during expected peaks.

In conclusion, breaking down ride requests by pickup point helps Uber strike the right balance of driver supply — ensuring both Airport and City riders enjoy reliable and timely service, while optimizing earnings potential for drivers in both areas.

**-- 8. Cancellation % by Pickup Point**

SELECT

pickup\_point,

COUNT(\*) AS total\_requests,

SUM(CASE WHEN status = 'Cancelled' THEN 1 ELSE 0 END) AS cancelled\_rides,

ROUND((SUM(CASE WHEN status = 'Cancelled' THEN 1 ELSE 0 END) / COUNT(\*)) \* 100, 2) AS cancellation\_percentage

FROM uber\_data

GROUP BY pickup\_point;

**-- Output 8**

|  |  |  |  |
| --- | --- | --- | --- |
| **pickup\_point** | **total\_requests** | **cancelled\_rides** | **cancellation\_percentage** |
| Airport | 3238 | 198 | 6.11 |
| City | 3507 | 1066 | 30.4 |

**Query Insights :**

This query calculates the percentage of cancelled rides for each pickup point — helping us understand whether certain pickup zones face more frequent cancellations than others.

Cancellation % is an important quality metric, because high cancellation rates:

* Lead to poor customer experience
* Increase wait times and frustration
* Potentially drive customers to alternative services

By comparing total requests and cancelled rides at each pickup point, we can see which areas contribute most to this problem — and identify where Uber can focus improvements.

If the Airport shows a high cancellation percentage, potential reasons could include:

* Drivers unwilling to wait in long pickup queues
* Flight delays causing timing mismatches
* Drivers rejecting trips that may take them far away from busy zones

If the City shows a higher cancellation rate, it might be linked to:

* Traffic congestion making trips undesirable for drivers
* Short trips offering lower earnings potential
* Last-minute customer cancellations

Understanding these dynamics enables Uber to implement targeted measures such as:

* Incentives or bonuses for drivers accepting trips from high-cancellation zones
* Dynamic pricing during problematic hours
* Operational improvements (better pickup instructions or queue management at Airports)

In addition, improving cancellation rates strengthens service reliability — which in turn improves customer trust and loyalty.

By monitoring this metric over time, Uber can track the effectiveness of its interventions and ensure a smoother ride experience for customers across all pickup points.

**Business recommendations**

Based on the SQL analysis of Uber ride data, several key trends were identified that can inform actionable business strategies to improve service quality, optimize driver availability, and enhance customer experience.

One of the most important findings is the existence of clear supply-demand gaps during certain hours of the day. The analysis of hourly ride requests and fulfillment rates showed that while demand is relatively well met during mid-day and evening hours, there are notable periods — particularly early mornings and late nights — where the number of completed trips falls short compared to total ride requests. This supply shortfall leads to a higher frequency of "No Cars Available" outcomes during those hours.

To address this issue, it is recommended that Uber implement targeted driver incentives during under-served hours. Bonuses, dynamic pricing, or special shift incentives for drivers willing to operate late nights or early mornings can help balance supply with demand more effectively. Additionally, better forecasting of demand patterns using historical ride data can help Uber proactively manage driver deployment and scheduling.

The project also uncovered high cancellation rates during certain time windows and at specific pickup points. Elevated cancellation percentages can erode customer trust and lead to dissatisfaction. Business actions to reduce cancellation rates should include:

* Driver engagement and education to encourage the acceptance of trips during high-cancellation periods.
* Improved app communication to ensure customers receive accurate estimated arrival times.
* Penalty structures or dynamic pricing to discourage last-minute cancellations.

In particular, the analysis of Airport rides highlighted another opportunity. The Airport remains a high-value pickup location but is prone to supply gaps during peak arrival times. Uber should consider offering dedicated airport bonuses or airport queue management improvements to better serve passengers arriving at the Airport. Additionally, syncing driver availability with major flight schedules could reduce unserved demand.

In the City pickup zone, demand patterns are more consistent but still show peaks and troughs. Continued monitoring of these trends will help Uber fine-tune driver coverage and reduce response times during high-demand periods.

Lastly, maintaining a continuous feedback loop between data insights and operational adjustments is crucial. Regular review of ride request patterns, cancellation rates, and "No Cars Available" metrics — using similar SQL analysis — will help Uber dynamically adapt its service model as market conditions evolve.

In conclusion, Uber can significantly improve ride fulfillment and customer satisfaction by:

* Offering time-based driver incentives
* Targeting high-cancellation zones and hours
* Enhancing Airport pickup processes
* Using data-driven driver scheduling
* Continuously monitoring key service metrics

Implementing these recommendations will help Uber strengthen its competitive edge and ensure a more reliable and seamless experience for its riders.

**Final conclusion**

The SQL-based analysis of Uber ride data has provided valuable insights into the platform’s operational performance and service trends. Through a structured set of queries, this project explored key areas such as ride fulfillment rates, demand patterns, cancellations, no-car-availability issues, and pickup point performance.

The first query highlighted that while a significant proportion of ride requests are successfully completed, there remains a notable percentage of cancellations and instances where no cars were available. This reflects opportunities to further optimize driver availability and reduce service gaps.

Hourly analysis of supply and demand revealed clear fluctuations throughout the day. As expected, demand peaks during morning and evening commute hours, as well as during late-night periods. However, fulfillment rates do not always align with demand, especially in early morning and late-night hours — suggesting that supply does not consistently match rider needs during those periods.

The exploration of cancellation patterns further reinforced this finding. Cancellations were more frequent during off-peak hours and in situations where supply constraints or operational challenges may be affecting service quality.

A focused look at "No Cars Available" events highlighted specific time windows where Uber faces challenges in meeting customer demand. This reinforces the importance of using data-driven approaches to fine-tune driver incentives and shift planning.

Comparative analysis between Airport and City pickup points provided additional layers of insight. The Airport exhibited sharper peaks and more concentrated gaps, often tied to flight schedules. The City, on the other hand, displayed more stable demand with occasional service imbalances.

Finally, calculating cancellation percentages by pickup point revealed opportunities for Uber to improve driver engagement and reduce cancellation rates in specific zones.

In summary, this project demonstrated how SQL-driven analysis can uncover actionable insights from ride data. Uber can leverage these findings to better align driver supply with demand, enhance service reliability, and improve customer experience across its network. Continued use of such data-driven strategies will help Uber maintain service excellence and strengthen its competitive position in the ride-hailing market.