Provide Insights & Performance Analysis in Transport Domain

Resume Project Challenge #13 organized by Codebasics

Presented by Mohd Mukarram Ibrahimi

Agenda

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Problem Statement

Goodcabs, a cab service company, operates in 10 tier-2 cities in India and supports local drivers while providing excellent service to passengers. The company has set ambitious growth and passenger satisfaction targets for 2024.

The Chief of Operations needs immediate insights into key performance metrics, including trip volume, passenger satisfaction, repeat passenger rate, trip distribution, and the balance between new and repeat passengers.

However, due to the analytics manager's unavailability, the task has been assigned to me, to analyze these metrics and deliver actionable insights.

Goal

The goal of this project is to deliver actionable insights on Goodcabs' performance in 10 tier-2 cities by analyzing key metrics,

- **Identify growth opportunities** by understanding trip trends.

- **Enhance passenger satisfaction** through targeted improvements.

- **Boost customer retention** by increasing repeat passenger rates.

- **Optimize operations** by balancing new and repeat passenger engagement.

- **Support strategic decision-making** to achieve 2024 performance targets.

Data Overview

Database	Table Name	Short Description
trips_db	dim_city	Contains city-specific details for location-based analysis.
trips_db	dim_date	Provides date-specific details for time-based analysis (month, weekday/weekend).
trips_db	fact_passenger_summary	Aggregated monthly summary of total, new, and repeat passengers by city.
trips_db	dim_repeat_trip_distribution	Aggregated breakdown of repeat trip behavior by month, city, and trip frequency (up to 10 trips/month).
trips_db	fact_trips	Detailed trip-level data, including distance, fare, and passenger/driver ratings.
targets_db	city_target_passenger_rating	Monthly target average passenger ratings for each city.
targets_db	monthly_target_new_passengers	Monthly targets for new passenger acquisition by city.
targets_db	monthly_target_trips	Monthly targets for total trip volume by city.

▪ Dataset are available for 6 months duration from January 2024 to June 2024.

▪ I have created new table named City Category which have info about (tourism and business focused cities)
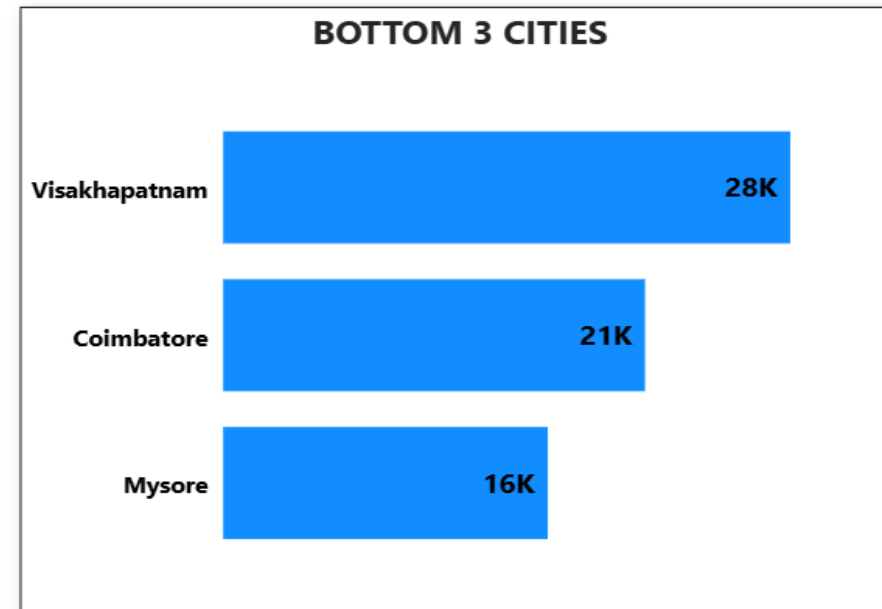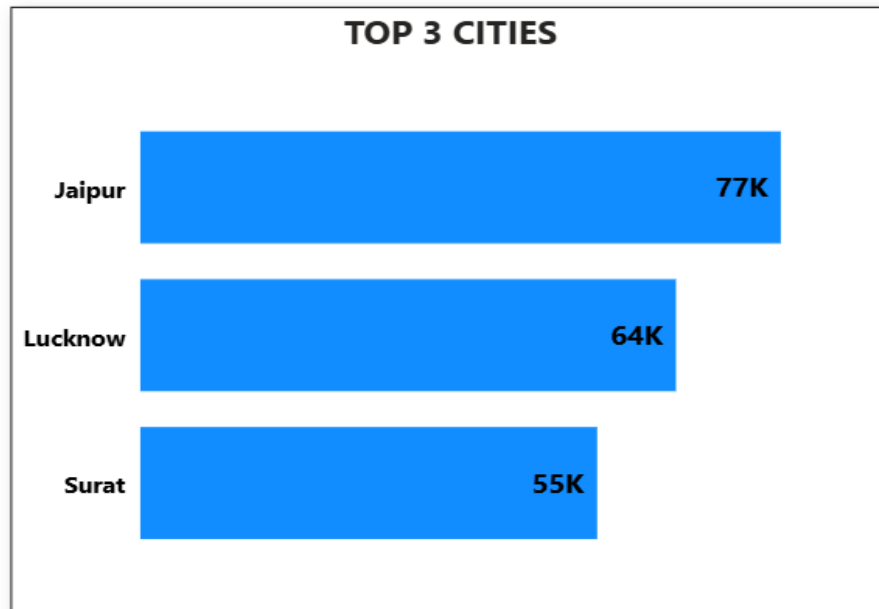
Data Model
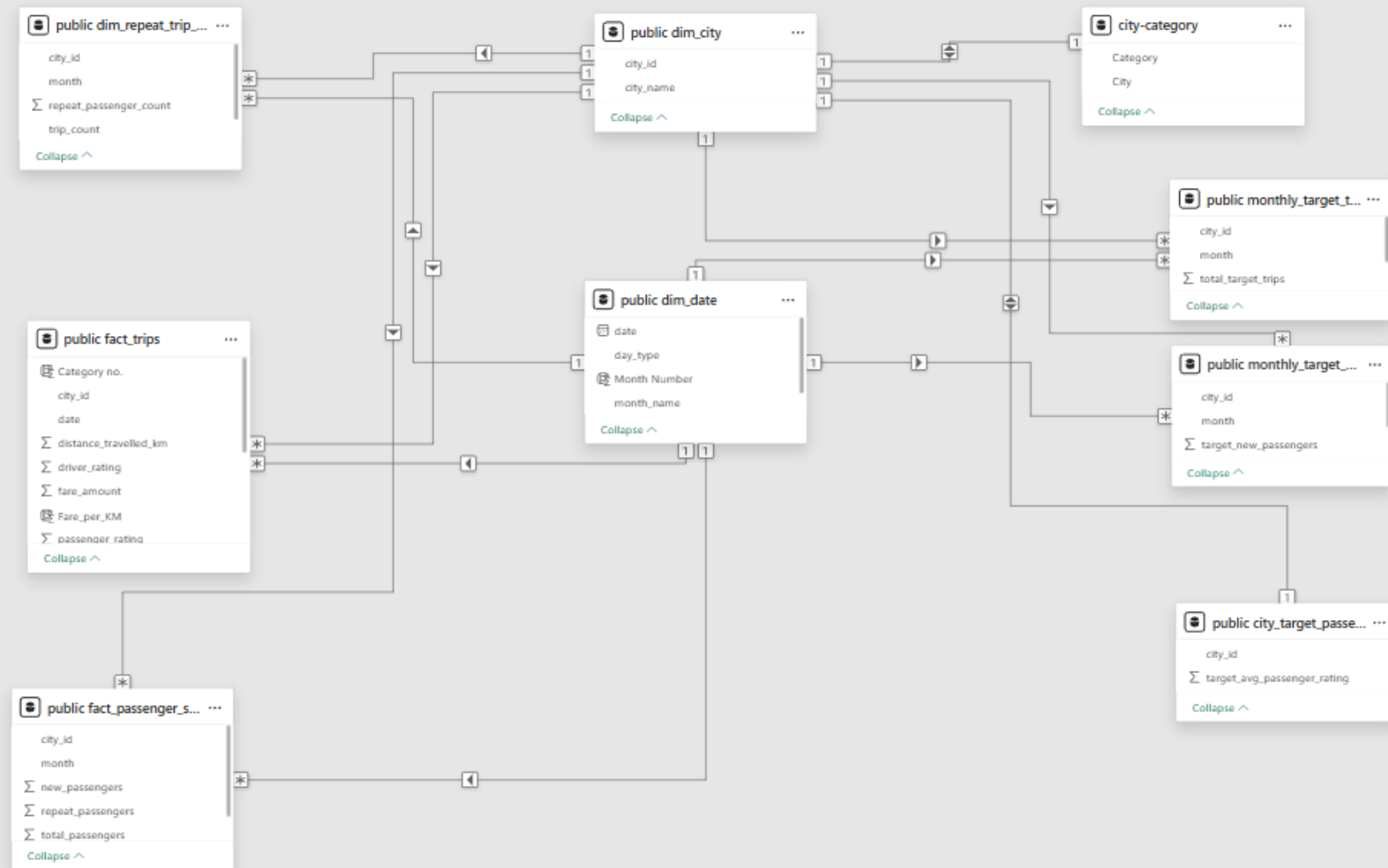
Dashboard Preview

Live Dashboard Link

Primary Analysis and Insights

1. Identify the top 3 and bottom 3 cities by total trips over the entire analysis period.
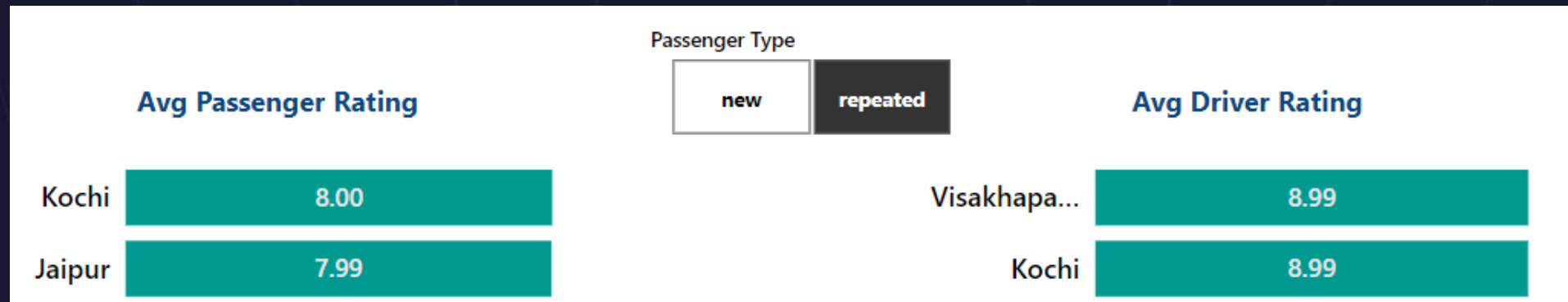
2. Calculate the average fare per trip for each city and compare it with the city's average trip distance. Identify the cities with the highest and lowest average fare per trip to assess pricing efficiency across locations.

city_name	AVG fare_amount	AVG distance_travelled_km	AVG Fare_per_KM
Jaipur	₹ 483.92	30.02	₹ 16.25
Mysore	₹ 249.71	16.50	₹ 15.40
Kochi	₹ 335.25	24.07	₹ 14.13
Visakhapatnam	₹ 282.67	22.55	₹ 12.70
Chandigarh	₹ 283.69	23.52	₹ 12.18
Lucknow	₹ 147.18	12.51	₹ 12.14
Coimbatore	₹ 166.98	14.98	₹ 11.30
Indore	₹ 179.84	16.50	₹ 11.07
Surat	₹ 117.27	11.00	₹ 10.92
Vadodara	₹ 118.57	11.52	₹ 10.54
Total	**₹ 254.02**	**19.13**	**₹ 12.86**

3. Calculate the average passenger and driver ratings for each city, segmented by passenger type (new vs. repeat). Identify cities with the highest and lowest average ratings.
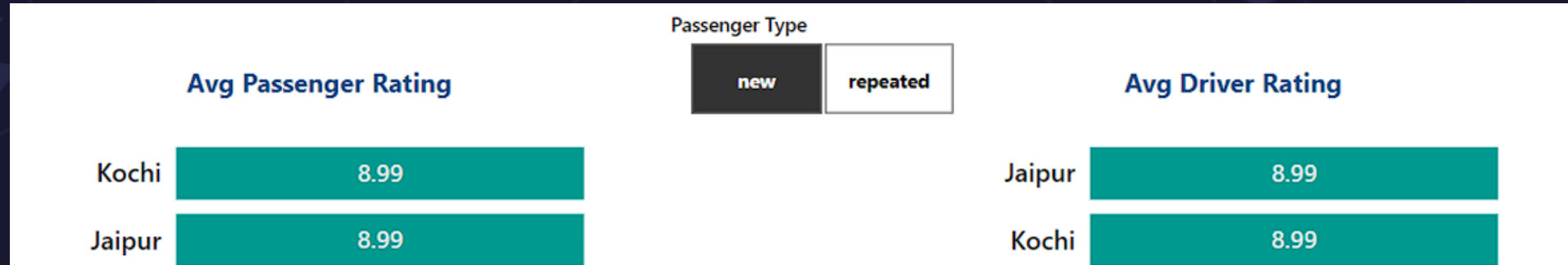
Highest

3. Calculate the average passenger and driver ratings for each city, segmented by passenger type (new vs. repeat). Identify cities with the highest and lowest average ratings.
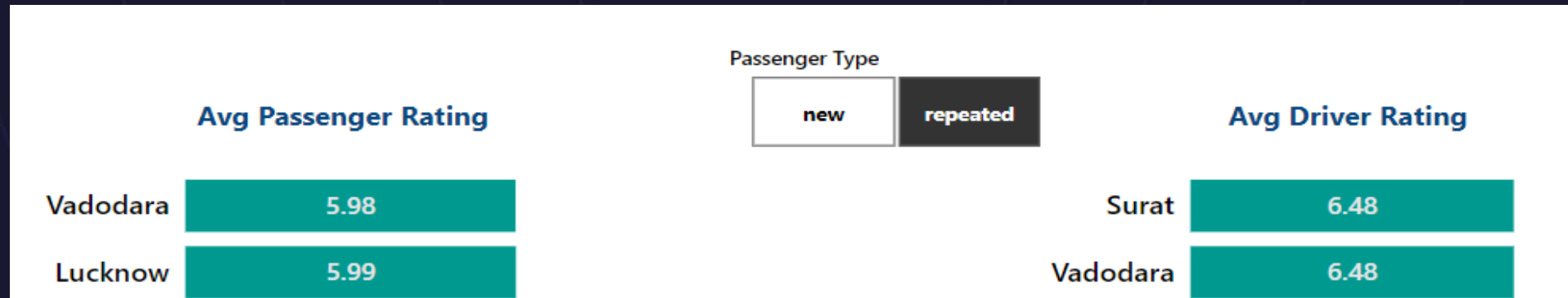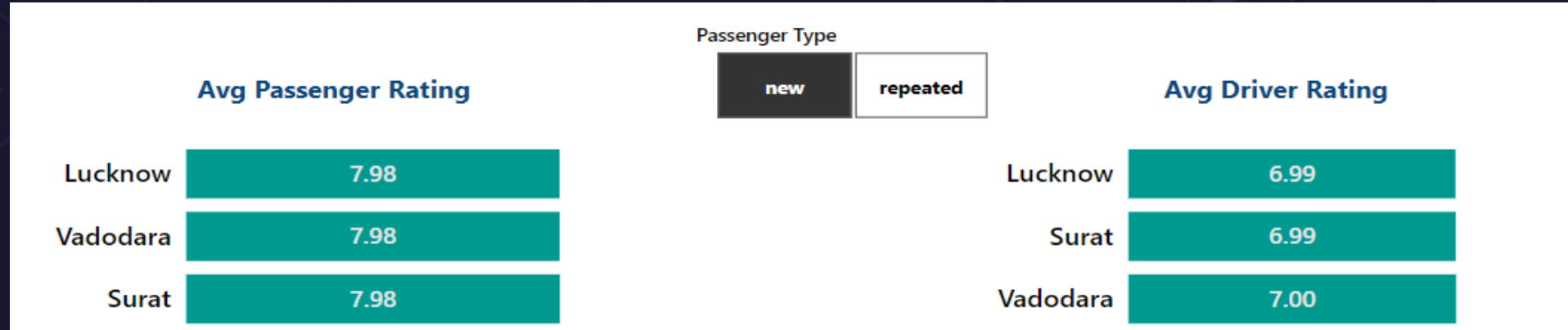
Lowest

4. For each city, identify the month with the highest total trips (peak demand) and the month with the lowest total trips (low demand).

City	Peak Demand	Low Demand
Chandigarh	February	April
Coimbatore	March	June
Indore	May	June
Jaipur	February	June
Kochi	May	June
Lucknow	February	May
Mysore	May	January
Surat	April	January
Vadodara	April	June
Visakhapatnam	April	January

5. Compare the total trips taken on weekdays versus weekends for each city over the six-month period. Identify cities with a strong preference for either weekend or weekday trips to understand demand variations.

Toal Trips by City

Day Type ● Weekday ● Weekend
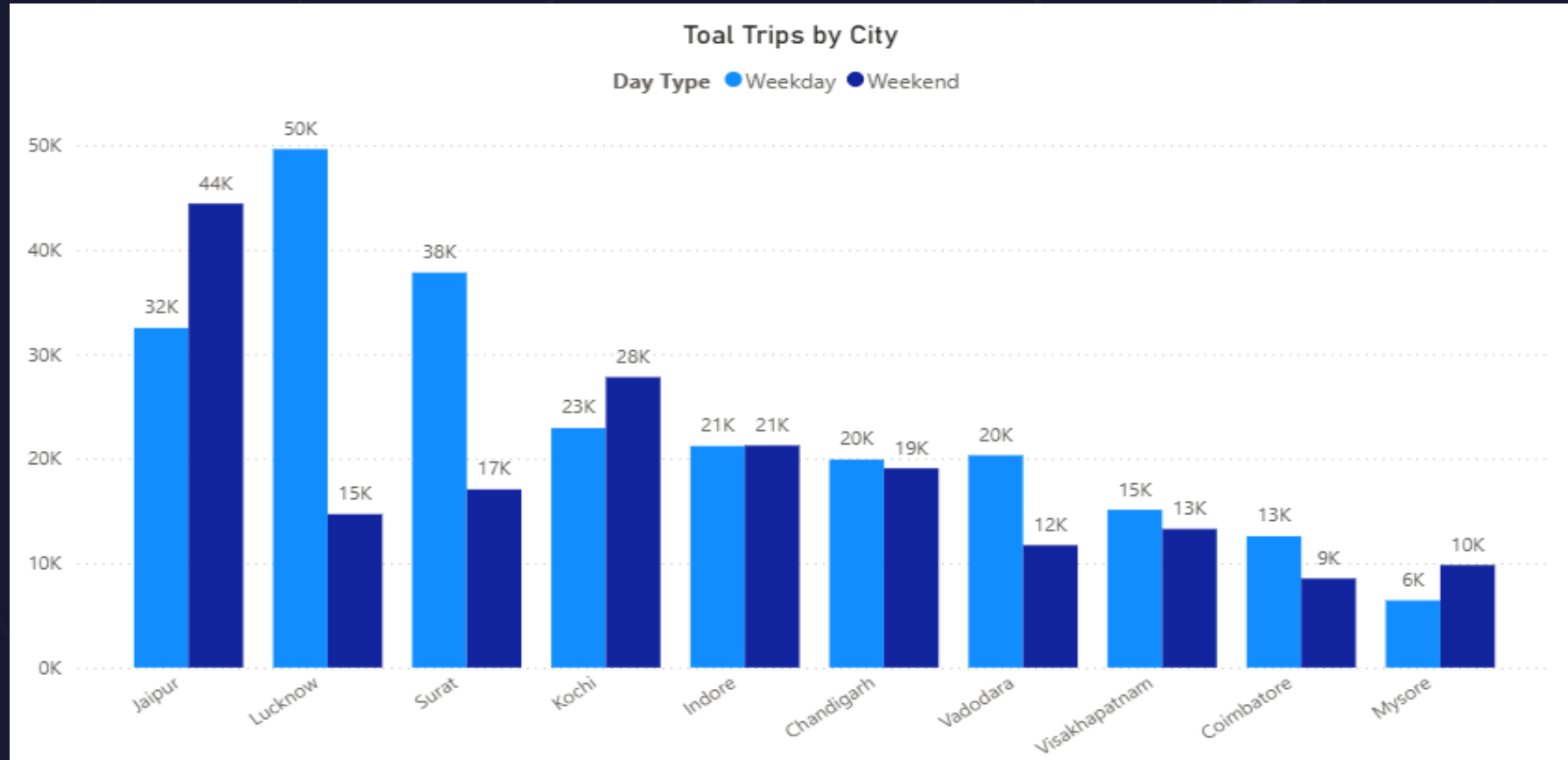
6. Identify which cities contribute most to higher trip frequencies among repeat passengers, and examine if there are distinguishable patterns between tourism-focused and business-focused cities.

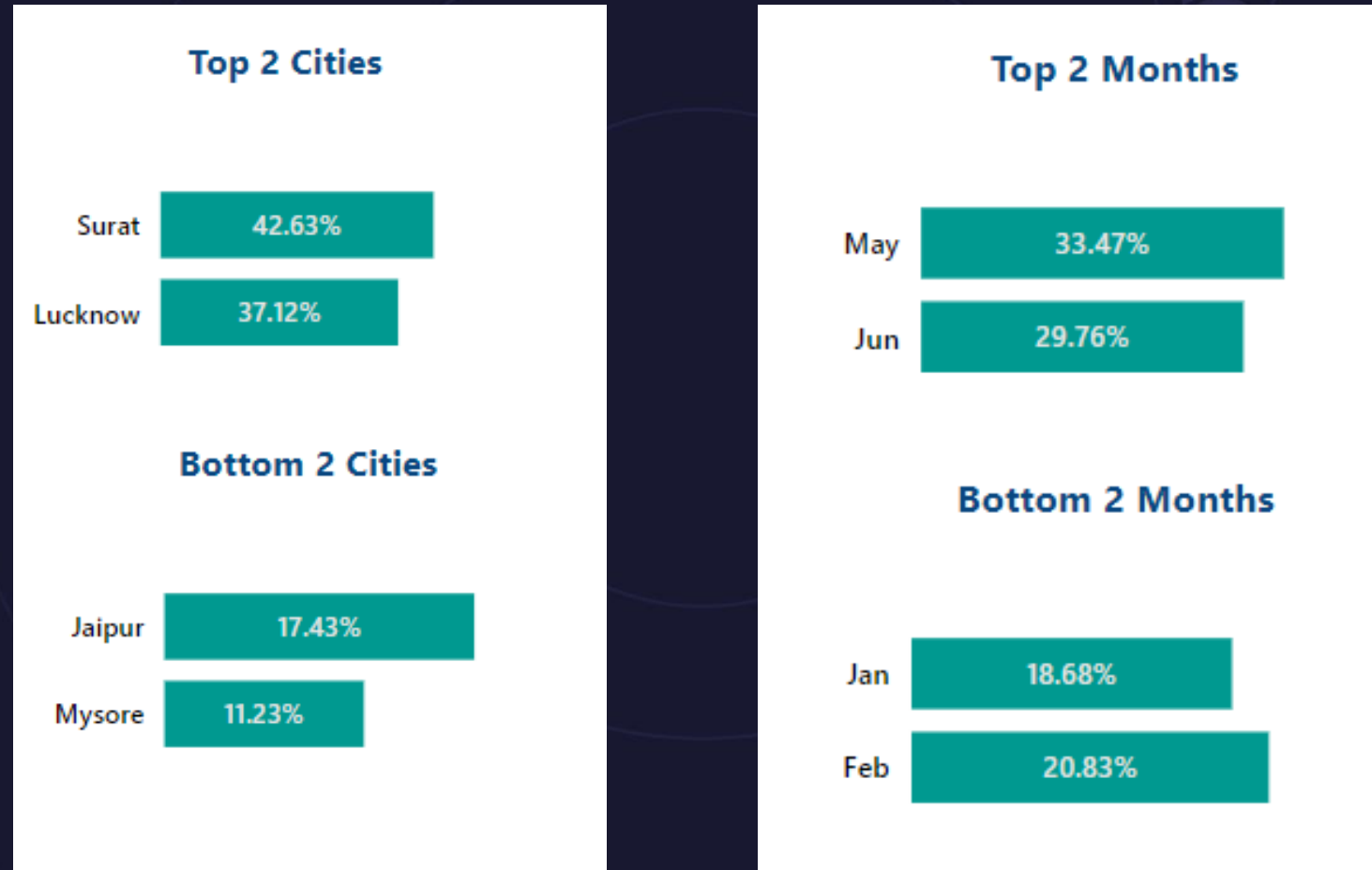| City	10-Trips	2-Trips	3-Trips	4-Trips	5-Trips	6-Trips	7-Trips	8-Trips	9-Trips
Chandigarh	1.79%	32.31%	19.25%	15.74%	12.21%	7.42%	5.48%	3.47%	2.33%
Coimbatore	1.22%	11.21%	14.82%	15.56%	20.62%	17.64%	10.47%	6.15%	2.31%
Indore	1.51%	34.34%	22.69%	13.40%	10.34%	6.85%	5.24%	3.26%	2.38%
Jaipur	0.97%	50.14%	20.73%	12.12%	6.29%	4.13%	2.52%	1.90%	1.20%
Kochi	0.81%	47.67%	24.35%	11.81%	6.48%	3.91%	2.11%	1.65%	1.21%
Lucknow	1.10%	9.66%	14.77%	16.20%	18.42%	20.18%	11.33%	6.43%	1.91%
Mysore	0.47%	48.75%	24.44%	12.73%	5.82%	4.06%	1.76%	1.42%	0.54%
Surat	1.35%	9.76%	14.26%	16.55%	19.75%	18.45%	11.89%	6.24%	1.74%
Vadodara	1.61%	9.87%	14.17%	16.52%	18.06%	19.08%	12.86%	5.78%	2.05%
Visakhapatnam	0.92%	51.25%	24.96%	9.98%	5.44%	3.19%	1.98%	1.39%	0.88%
Total	**1.20%**	**30.06%**	**19.17%**	**14.09%**	**12.42%**	**10.77%**	**6.73%**	**3.88%**	**1.68%**

7. For each city, evaluate monthly performance against targets for total trips, new passengers, and average passenger ratings. Determine if each metric met, exceeded, or missed the target, and calculate the percentage difference.

Monthly (TA) Status for Total Trips, New Passengers and AVG.Passenger Rating

City	Category	Trip TA	Trip TD%	New Pass. TA	New Pass. TD%	Avg.Pass. Rating TA	Avg.Pass. Rating TD%
Chandigarh	Tourism-focused	Missed	-0.05%	Missed	-9.96%	Missed	-0.29%
Coimbatore	Business-focused	Exceeded	0.50%	Exceeded	13.52%	Missed	-4.45%
Indore	Business-focused	Missed	-2.40%	Exceeded	5.41%	Missed	-2.15%
Jaipur	Tourism-focused	Exceeded	13.91%	Missed	-15.08%	Exceeded	4.05%
Kochi	Tourism-focused	Exceeded	2.43%	Missed	-2.16%	Exceeded	0.19%
Lucknow	Business-focused	Missed	-10.70%	Exceeded	4.23%	Missed	-10.49%
Mysore	Tourism-focused	Exceeded	20.28%	Missed	-2.66%	Exceeded	2.37%
Surat	Business-focused	Missed	-3.78%	Exceeded	10.72%	Missed	-8.33%
Vadodara	Business-focused	Missed	-14.60%	Exceeded	2.29%	Missed	-11.85%
Visakhapatnam	Business-focused	Missed	-0.47%	Missed	-5.58%	Missed	-0.79%

8. Identify the top 2 and bottom 2 cities based on their RPR% to determine which locations have the strongest and weakest rates. Similarly, analyze the RPR% by month across all cities and identify the months with the highest and lowest repeat passenger rates.

Top 2 Cities

City	RPR%
Surat	42.63%
Lucknow	37.12%

Bottom 2 Cities

City	RPR%
Jaipur	17.43%
Mysore	11.23%

Top 2 Months

Month	RPR%
May	33.47%
Jun	29.76%

Bottom 2 Months

Month	RPR%
Jan	18.68%
Feb	20.83%

Secondary Analysis & Recommendations

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1. Factors Influencing Repeat Passenger Rates

➢ Use the data points like repeat passenger count, passenger ratings, city demographics, and pricing data to identify patterns.

➢ **Insights:**

- Higher repeat passenger rates may correlate with better passenger ratings, indicating quality service.

- Competitive pricing might attract more repeat passengers in cities with a price-sensitive demographic.

- Socioeconomic factors: Cities with higher-income groups may prefer premium services, whereas lower-income groups may prefer cost-effective services.

- Lifestyle patterns: Cities with high professional populations (e.g., IT hubs) may show consistent repeat usage during weekdays.

➢ **Recommendation:**

- Focus on improving service quality and offering personalized pricing plans for cities with lower repeat rates.

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2. Tourism vs. Business Demand Impact

➢ Cross-referenced trip data with event calendars (festivals, conferences, tourism seasons) over 6 months.

➢ **Insights:**

- **Cities with high tourism activities (e.g., Jaipur, Kochi) show demand spikes during festive seasons or vacations.**

- **Business-oriented cities (e.g., Lucknow, Surat) show consistent weekday demand.**

➢ **Recommendation:**

- Tailor marketing efforts to highlight tourism-related campaigns in high-demand periods.

- offer flexible services for business travelers e.g., loyalty program, ride packages for conferences.

3. 3. Emerging Mobility Trends and Goodcabs' Adaptation

➤ Evaluate trends like adoption of electric vehicles, passenger preferences for green energy, and emerging mobility needs.

➤ **Insights:**

- **Electric Vehicle (EV) Adoption: Growing preference for green transport in tier-2 cities. EV could reduce operational costs and appeal to environmentally conscious passengers.**

- **Sustainability Focus: Eco-conscious passengers favor ride-sharing and low-emission options.**

➤ **Recommendation:**

- Gradually integrate electric or hybrid vehicles in tier-2 cities to stay competitive and consider offering discounts on eco-friendly Rides.

4. Partnership Opportunities with Local Businesses

➢ Reviewed trip destinations to identify potential partnerships with hotels, malls, and event venues.

➢ **Insights:**

- **Popular tourist destinations and business centers could be leveraged for tie-ups.**

- **Partnerships with event venues (e.g., offering discounts for rides to events) could drive loyalty.**

➢ **Recommendation:**

- Collaborate with local businesses to offer joint promotions for e.g. Exclusive deals with local hotels in popular tourist destinations .

- Establish partnerships with event venues for exclusive discounts or bundled deals.

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5. Data Collection for Enhanced Data-Driven Decisions

➢ Identify gaps in the existing dataset and suggest additional data collection efforts.

➢ **Suggestions for Additional Data:**

- **Passenger data: Frequency of use, Detailed Rating by passengers, and referral usage.**

- **Driver data: Availability, on-time performance, and training status.**

- **Market trends: Competition metrics like pricing and service offerings in each city.**

- **City-specific events: Add event calendars to better predict demand fluctuations.**

➢ **Recommendation:**

- Invest in a feedback system to collect qualitative data on passenger satisfaction and driver performance. Use predictive analytics to optimize supply-demand matching.

Ad-Hoc Business Requests

1. Generate a report that displays the total trips, average fare per km, average fare per trip, and the percentage contribution of each city's trips to the overall trips.

	city_name character varying (50)	total_trips bigint	avg_fare_per_km numeric	avg_fare_per_trip numeric	contribution_to_total_trips numeric
1	Chandigarh	38981	12.06	283.69	9.15
2	Coimbatore	21104	11.15	166.98	4.96
3	Indore	42456	10.90	179.84	9.97
4	Jaipur	76888	16.12	483.92	18.05
5	Kochi	50702	13.93	335.25	11.90
6	Lucknow	64299	11.76	147.18	15.10
7	Mysore	16238	15.14	249.71	3.81
8	Surat	54843	10.66	117.27	12.88
9	Vadodara	32026	10.29	118.57	7.52
10	Visakhapatnam	28366	12.53	282.67	6.66

2. Generate a report that evaluates the target performance for trips at the monthly and city level. For each city and month, compare the actual total trips with the target trips and categories the performance as follows:

If actual trips > target trips - "Above Target".
If actual trips <= target trips - "Below Target".

Additionally, calculate the % difference between actual and target trips to quantify the performance gap.

	city_name character varying (50)	month_name character varying (20)	actual_trips bigint	total_target_trips integer	performance_status text	pct_difference numeric
1	Visakhapatnam	January	4468	4500	Below Target	-0.71
2	Chandigarh	January	6810	7000	Below Target	-2.71
3	Surat	January	8358	9000	Below Target	-7.13
4	Vadodara	January	4775	6000	Below Target	-20.42
5	Mysore	January	2485	2000	Above Target	24.25
6	Kochi	January	7344	7500	Below Target	-2.08
7	Indore	January	6737	7000	Below Target	-3.76
8	Jaipur	January	14976	13000	Above Target	15.20
9	Coimbatore	January	3651	3500	Above Target	4.31
10	Lucknow	January	10858	13000	Below Target	-16.48
11	Visakhapatnam	February	4793	4500	Above Target	6.51
12	Chandigarh	February	7387	7000	Above Target	5.53
13	Surat	February	9069	9000	Above Target	0.77
14	Vadodara	February	5228	6000	Below Target	-12.87
15	Mysore	February	2668	2000	Above Target	33.40
16	Kochi	February	7688	7500	Above Target	2.51
17	Indore	February	7210	7000	Above Target	3.00
18	Jaipur	February	15872	13000	Above Target	22.09
19	Coimbatore	February	3404	3500	Below Target	-2.74
20	Lucknow	February	12060	13000	Below Target	-7.23
21	Visakhapatnam	March	4877	4500	Above Target	8.38
22	Chandigarh	March	6569	7000	Below Target	-6.16
23	Surat	March	9267	9000	Above Target	2.97

3. Generate a report that shows the percentage distribution of repeat passengers by the number of trips they have taken in each city. Calculate the percentage of repeat passengers who took 2 trips, 3 trips, and so on, up to 10 trips. Each column should represent a trip count category, displaying the percentage of repeat passengers who fall into that category out of the total repeat passengers for that city.

	city_name character varying (50) 🔒	2_Trips 🔒 numeric	3_Trips 🔒 numeric	4_Trips 🔒 numeric	5_Trips 🔒 numeric	6_Trips 🔒 numeric	7_Trips 🔒 numeric	8_Trips 🔒 numeric	9_Trips 🔒 numeric	10_Trips 🔒 numeric
1	Kochi	47.67	24.35	11.81	6.48	3.91	2.11	1.65	1.21	0.81
2	Mysore	48.75	24.44	12.73	5.82	4.06	1.76	1.42	0.54	0.47
3	Visakhapatnam	51.25	24.96	9.98	5.44	3.19	1.98	1.39	0.88	0.92
4	Indore	34.34	22.69	13.40	10.34	6.85	5.24	3.26	2.38	1.51
5	Vadodara	9.87	14.17	16.52	18.06	19.08	12.86	5.78	2.05	1.61
6	Jaipur	50.14	20.73	12.12	6.29	4.13	2.52	1.90	1.20	0.97
7	Surat	9.76	14.26	16.55	19.75	18.45	11.89	6.24	1.74	1.35
8	Lucknow	9.66	14.77	16.20	18.42	20.18	11.33	6.43	1.91	1.10
9	Chandigarh	32.31	19.25	15.74	12.21	7.42	5.48	3.47	2.33	1.79
10	Coimbatore	11.21	14.82	15.56	20.62	17.64	10.47	6.15	2.31	1.22

4. Generate a report that calculates the total new passengers for each city and ranks them based on this value. Identify the top 3 cities with the highest number of new passengers as well as the bottom 3 cities with the lowest number of new passengers, categorizing them as "Top 3" or "Bottom 3" accordingly.

	city_name character varying (50) 🔒	total_new_passengers bigint 🔒	city_category text 🔒
1	Jaipur	9682	Top 3
2	Lucknow	9597	Top 3
3	Surat	8638	Top 3
4	Vadodara	4346	Bottom 3
5	Coimbatore	2551	Bottom 3
6	Mysore	1477	Bottom 3

5. Generate a report that identifies the month with the highest revenue for each city. For each city, display the month name, the revenue amount for that month, and the percentage contribution of that month's revenue to the city's total revenue.

	city_name character varying (50) 🔒	highest_revenue_month 🔒 text	revenue_in_mil 🔒 numeric	pct_contribution 🔒 numeric
1	Chandigarh	February	2.11	19.07
2	Coimbatore	April	0.61	17.38
3	Indore	May	1.38	18.09
4	Jaipur	February	7.75	20.82
5	Kochi	May	3.33	19.61
6	Lucknow	February	1.78	18.78
7	Mysore	May	0.75	18.38
8	Surat	April	1.15	17.96
9	Vadodara	April	0.71	18.60
10	Visakhapatnam	April	1.39	17.34

6. Generate a report that calculates two metrics:

→ Monthly Repeat Passenger Rate: Calculate the repeat passenger rate for each city and month by comparing the number of repeat passengers to the total passengers.

→ City-wise Repeat Passenger Rate: Calculate the overall repeat passenger rate for each city, considering all passengers across months.

	city_name character varying (50)	month_name character varying (20)	total_passengers integer	repeat_passengers integer	monthly_rpr numeric	overall_rpr numeric
1	Chandigarh	June	2430	3297	135.68	126.81
2	Chandigarh	April	2496	3285	131.61	126.81
3	Chandigarh	March	3228	4100	127.01	126.81
4	Chandigarh	February	4104	4957	120.78	126.81
5	Chandigarh	May	2730	3699	135.49	126.81
6	Chandigarh	January	3920	4640	118.37	126.81
7	Coimbatore	June	1226	1628	132.79	129.96
8	Coimbatore	January	1822	2214	121.51	129.96
9	Coimbatore	May	1039	1543	148.51	129.96
10	Coimbatore	March	1538	1965	127.76	129.96
11	Coimbatore	February	1647	1993	121.01	129.96
12	Coimbatore	April	1242	1722	138.65	129.96
13	Indore	February	2878	3981	138.33	148.55
14	Indore	May	2028	3591	177.07	148.55
15	Indore	January	2843	3876	136.33	148.55
16	Indore	April	2351	3646	155.08	148.55
17	Indore	June	2021	3152	155.96	148.55
18	Indore	March	2742	3833	139.79	148.55
19	Jaipur	January	10423	11845	113.64	121.11
20	Jaipur	April	6120	7856	128.37	121.11
21	Jaipur	May	5332	7174	134.55	121.11
22	Jaipur	March	7417	9257	124.81	121.11
23	Jaipur	June	5775	6956	120.45	121.11

Thank You