Provide Insights & Performance Analysis in Transport Domain

Resume Project Challenge #13 organized by Codebasics

Presented by Puranjoy Patra

Agenda

- Problem Statement
- Goal
- Data Overview
- Data Model
- Dashboard Preview
- Primary Analysis & Insights
- Secondary Analysis & Recommendations
- Ad-Hoc Business Request Reports’
- Thanking Note

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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.

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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.

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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 “start of month” from dim_date table by extracting distinct start of month.
- Additionally I have used city category (Tourism or Business focused) data in csv.

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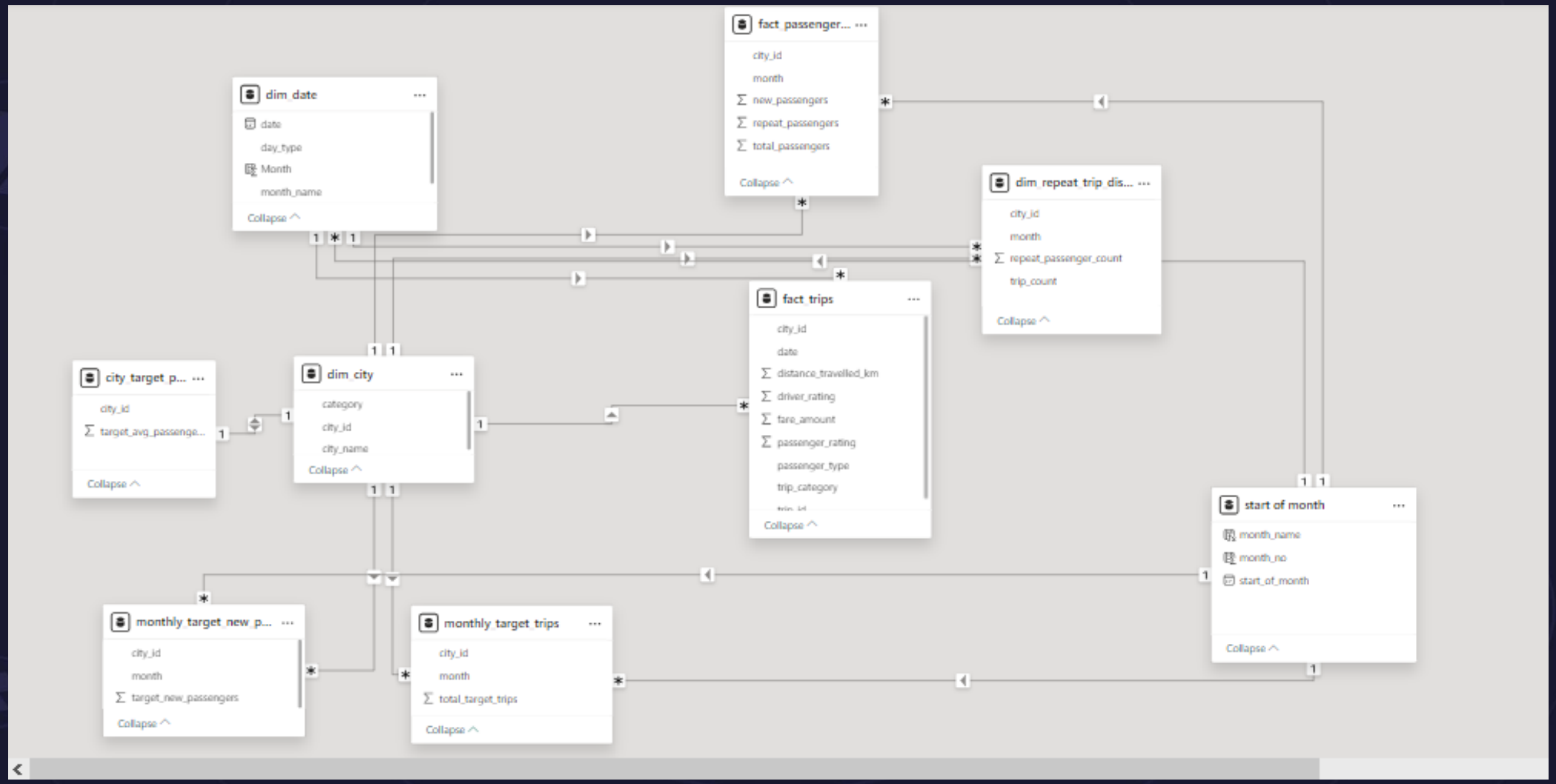
Data Model



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Dashboard Preview

Live Dashboard Link

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Primary Analysis and Insights

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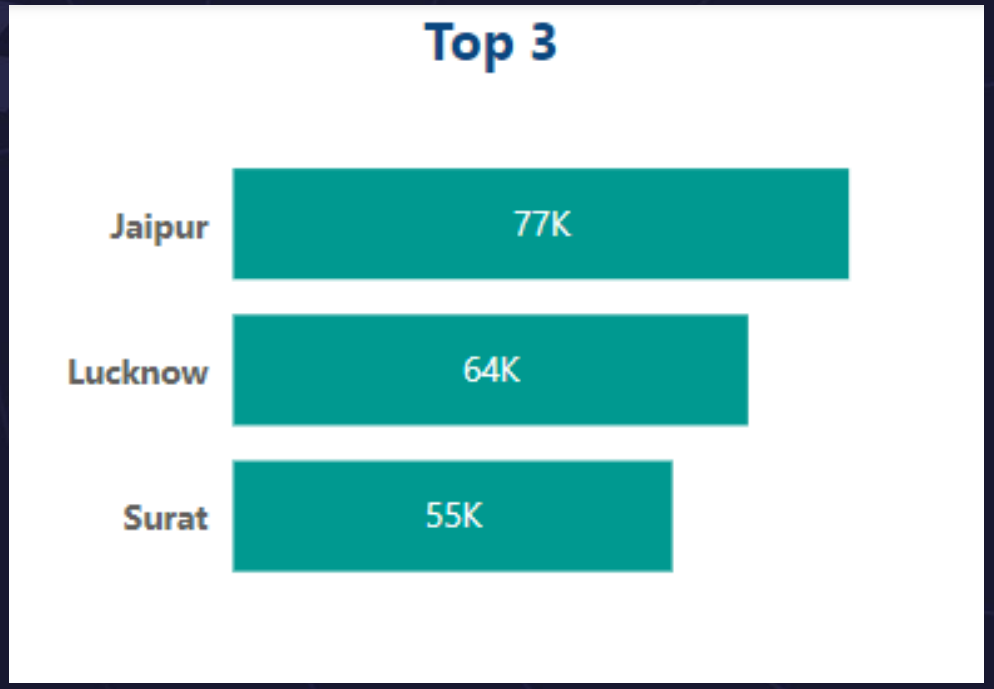
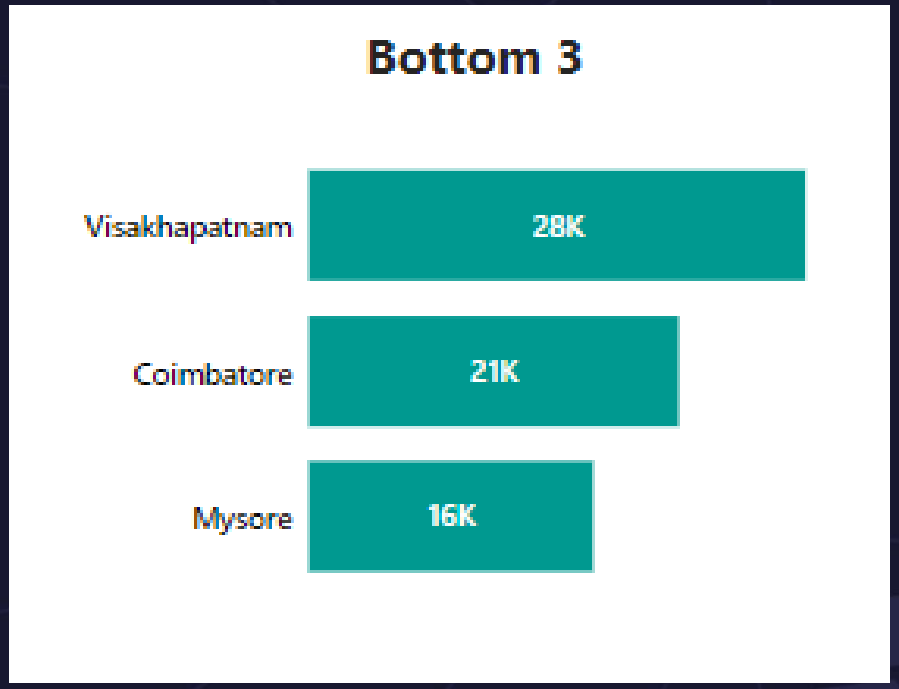
1. Identify the top 3 and bottom 3 cities by total trips over the entire analysis period.





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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	Avg Fare per Trip	Avg Trip Distance	Avg Fare per KM
Jaipur	₹ 483.92	30.02	₹ 16.12
Kochi	₹ 335.25	24.07	₹ 13.93
Chandigarh	₹ 283.69	23.52	₹ 12.06
Visakhapatnam	₹ 282.67	22.55	₹ 12.53
Mysore	₹ 249.71	16.50	₹ 15.14
Indore	₹ 179.84	16.50	₹ 10.90
Coimbatore	₹ 166.98	14.98	₹ 11.15
Lucknow	₹ 147.18	12.51	₹ 11.76
Vadodara	₹ 118.57	11.52	₹ 10.29
Surat	₹ 117.27	11.00	₹ 10.66
Total	**₹ 254.02**	**19.13**	**₹ 13.28**

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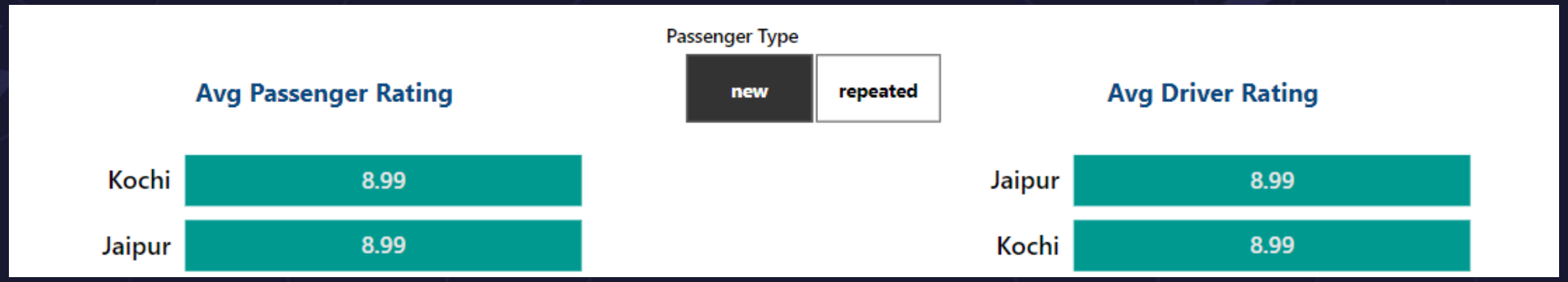
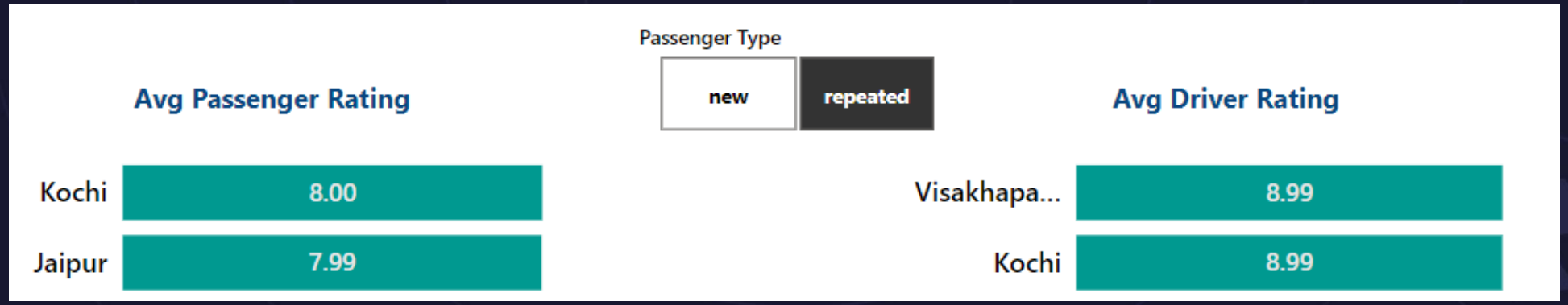
3. Calculate the average passenger and driver ratings for each city, segmented by passenger type (new vs. repeat). Identify cities with the highest and lowest average ratings.





Highest

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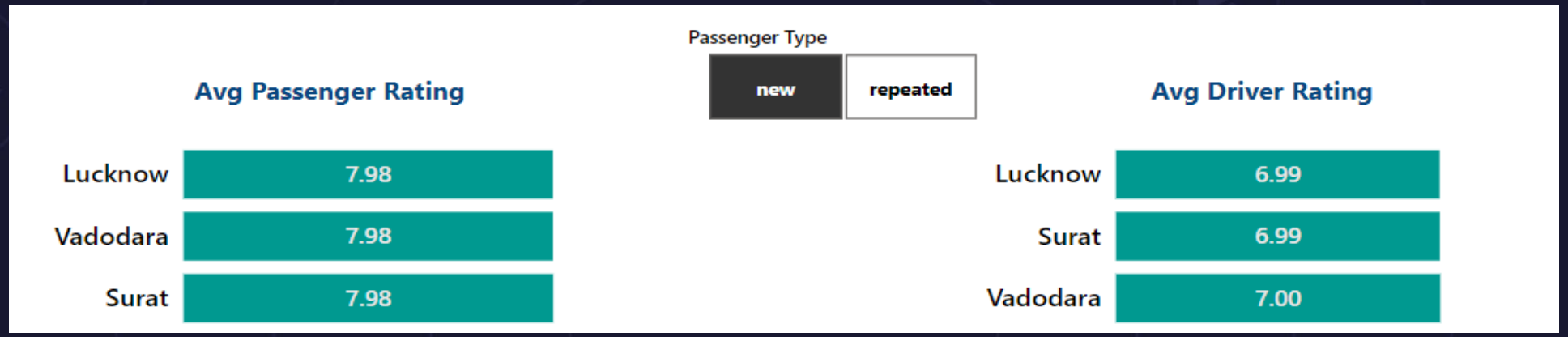
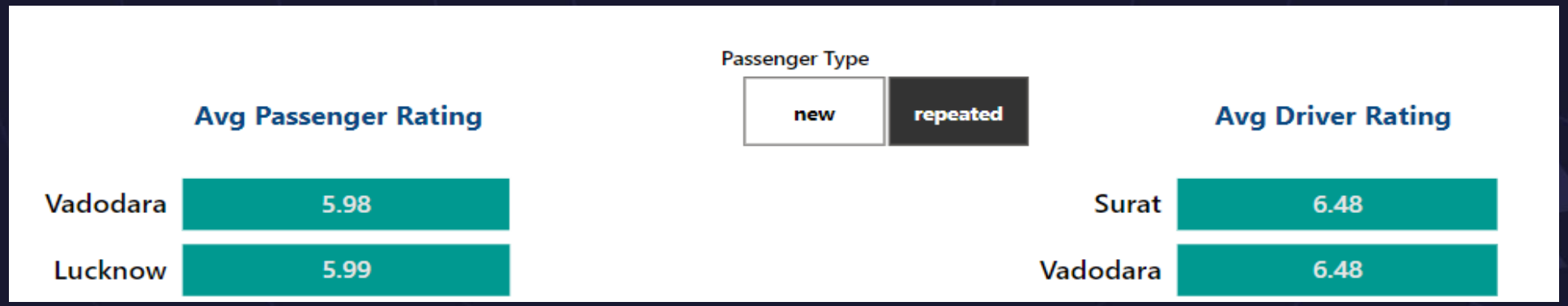
3. Calculate the average passenger and driver ratings for each city, segmented by passenger type (new vs. repeat). Identify cities with the highest and lowest average ratings.





Lowest

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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

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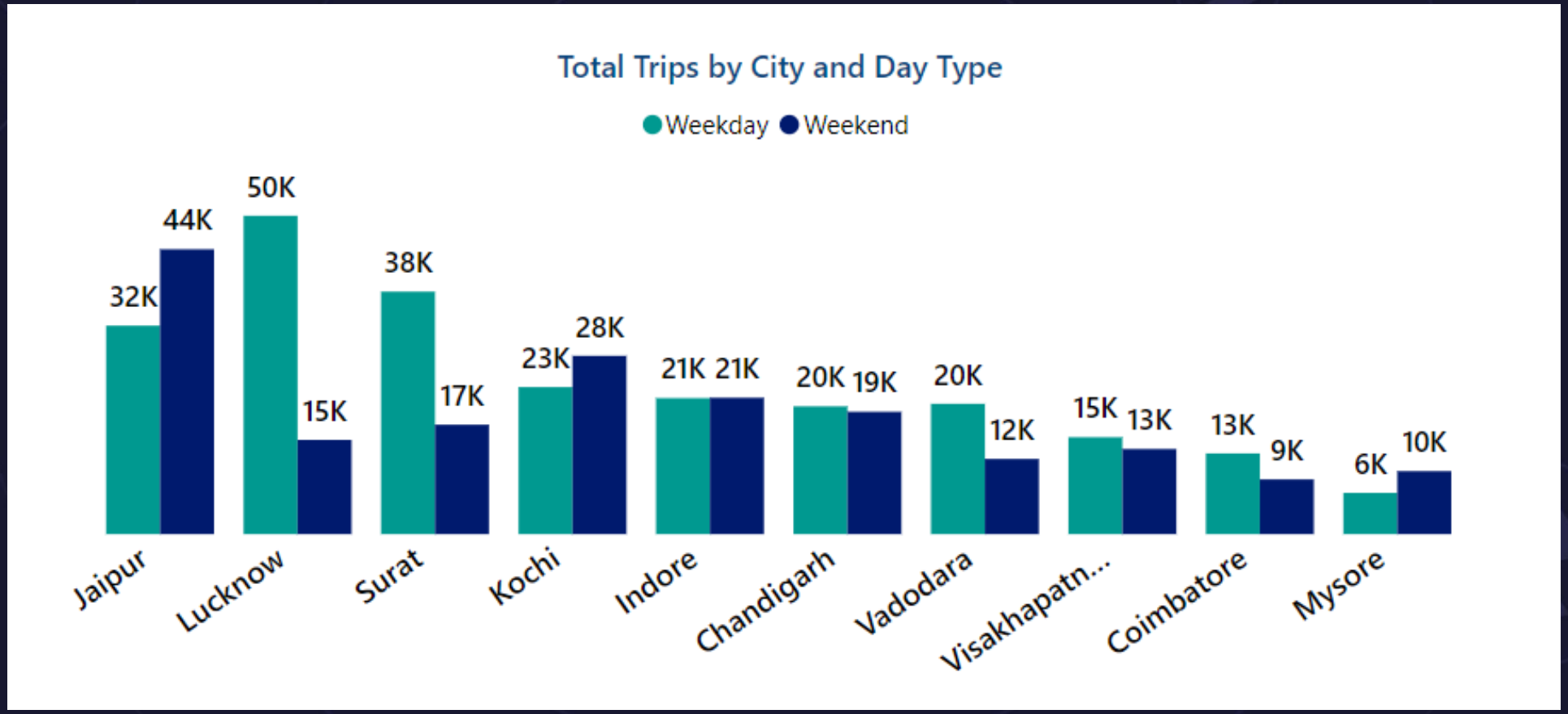
5. Compare the total trips taken on weekdays versus weekends for each city over the six-month period. Identify cities with a strong preference for either weekend or weekday trips to understand demand variations.



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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%**

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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.

City	Category	Trip Target Achievement	Trip Target diff %	New Passenger Target Achievement	New Passenger Target diff %	Avg Passenger Rating Target Achievement	Avg Passenger Rating Target diff %
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%

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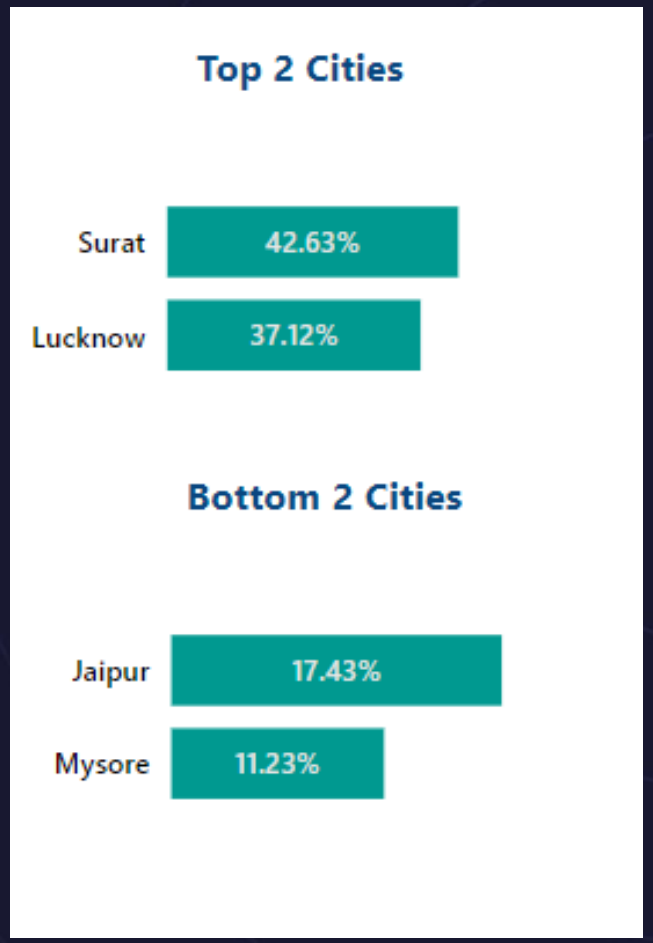
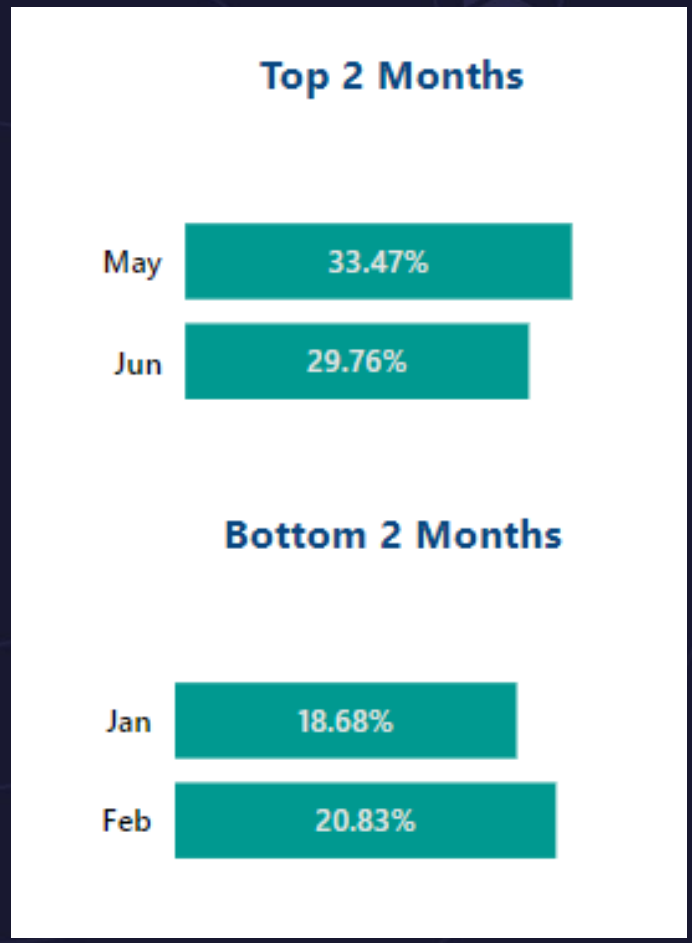
8. Identify the top 2 and bottom 2 cities based on their RPR% to determine which locations have the strongest and weakest rates. Similarly, analyze the RPR% by month across all cities and identify the months with the highest and lowest repeat passenger rates.





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

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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.

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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., free rides for shopping above a certain spend.
- 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, feedback on service quality, 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.

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Ad-Hoc Business Requests

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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	total_trips	avg_fare_per_km	avg_fare_per_trip	pct_contribution_to_total_trips
Chandigarh	38981	12.06	283.69	9.1526
Coimbatore	21104	11.15	166.98	4.9551
Indore	42456	10.90	179.84	9.9685
Jaipur	76888	16.12	483.92	18.0529
Kochi	50702	13.93	335.25	11.9046
Lucknow	64299	11.76	147.18	15.0971
Mysore	16238	15.14	249.71	3.8126
Surat	54843	10.66	117.27	12.8769
Vadodara	32026	10.29	118.57	7.5196
Visakhapatnam	28366	12.53	282.67	6.6602

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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	month_name	actual_trips	target_trips	performance_status	difference_pct
Visakhapatnam	January	4468	4500	Below	-0.71
Visakhapatnam	February	4793	4500	Above	6.51
Visakhapatnam	March	4877	4500	Above	8.38
Visakhapatnam	April	4938	5000	Below	-1.24
Visakhapatnam	May	4812	5000	Below	-3.76
Visakhapatnam	June	4478	5000	Below	-10.44
Chandigarh	January	6810	7000	Below	-2.71
Chandigarh	February	7387	7000	Above	5.53
Chandigarh	March	6569	7000	Below	-6.16
Chandigarh	April	5566	6000	Below	-7.23
Chandigarh	May	6620	6000	Above	10.33
Chandigarh	June	6029	6000	Above	0.48
Surat	January	8358	9000	Below	-7.13
Surat	February	9069	9000	Above	0.77
Surat	March	9267	9000	Above	2.97
Surat	April	9831	10000	Below	-1.69
Surat	May	9774	10000	Below	-2.26
Surat	June	8544	10000	Below	-14.56
Vadodara	January	4775	6000	Below	-20.42
Vadodara	February	5228	6000	Below	-12.87
Vadodara	March	5598	6000	Below	-6.70
Vadodara	April	5941	6500	Below	-8.60
Vadodara	May	5799	6500	Below	-10.78
Vadodara	June	4685	6500	Below	-27.92
Mysore	January	2485	2000	Above	24.25
Mysore	February	2668	2000	Above	33.40
Mysore	March	2633	2000	Above	31.65
Mysore	April	2603	2500	Above	4.12
Mysore	May	3007	2500	Above	20.28
Mysore	June	2842	2500	Above	13.68
Kochi	January	7344	7500	Below	-2.08
Kochi	February	7688	7500	Above	2.51
Kochi	March	9495	7500	Above	26.60
Kochi	April	9762	9000	Above	8.47
Kochi	May	10014	9000	Above	11.27

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

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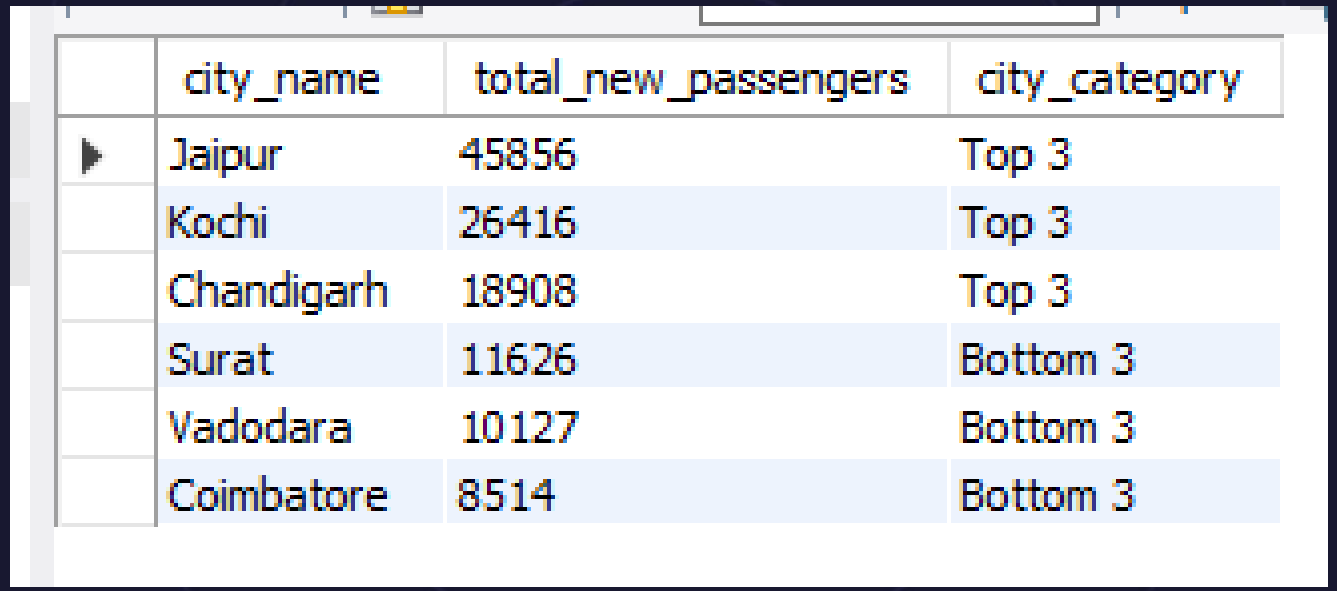
4. Generate a report that calculates the total new passengers for each city and ranks them based on this value. Identify the top 3 cities with the highest number of new passengers as well as the bottom 3 cities with the lowest number of new passengers, categorizing them as "Top 3" or "Bottom 3" accordingly.



city_name	total_new_passengers	city_category
Jaipur	45856	Top 3
Kochi	26416	Top 3
Chandigarh	18908	Top 3
Surat	11626	Bottom 3
Vadodara	10127	Bottom 3
Coimbatore	8514	Bottom 3

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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	highest_revenue_month	revenue_in_mln	pct_contribution
Visakhapatnam	April	1.39	17.34
Chandigarh	February	2.11	19.07
Surat	April	1.15	17.96
Vadodara	April	0.71	18.60
Mysore	May	0.75	18.38
Kochi	May	3.33	19.61
Indore	May	1.38	18.09
Jaipur	February	7.75	20.82
Coimbatore	April	0.61	17.38
Lucknow	February	1.78	18.78

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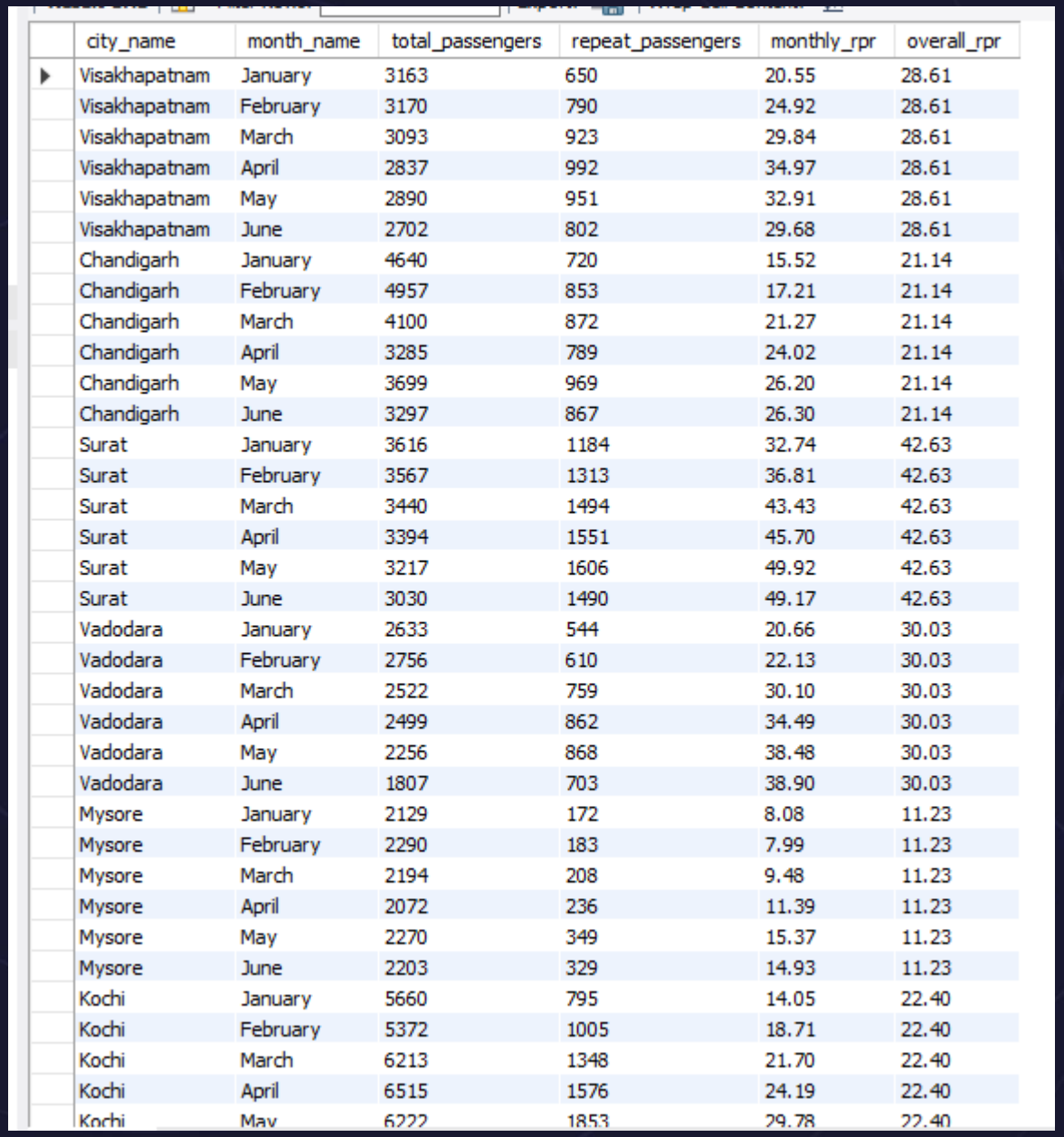
6. Generate a report that calculates two metrics:

→ 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	month_name	total_passengers	repeat_passengers	monthly_rpr	overall_rpr
Visakhapatnam	January	3163	650	20.55	28.61
Visakhapatnam	February	3170	790	24.92	28.61
Visakhapatnam	March	3093	923	29.84	28.61
Visakhapatnam	April	2837	992	34.97	28.61
Visakhapatnam	May	2890	951	32.91	28.61
Visakhapatnam	June	2702	802	29.68	28.61
Chandigarh	January	4640	720	15.52	21.14
Chandigarh	February	4957	853	17.21	21.14
Chandigarh	March	4100	872	21.27	21.14
Chandigarh	April	3285	789	24.02	21.14
Chandigarh	May	3699	969	26.20	21.14
Chandigarh	June	3297	867	26.30	21.14
Surat	January	3616	1184	32.74	42.63
Surat	February	3567	1313	36.81	42.63
Surat	March	3440	1494	43.43	42.63
Surat	April	3394	1551	45.70	42.63
Surat	May	3217	1606	49.92	42.63
Surat	June	3030	1490	49.17	42.63
Vadodara	January	2633	544	20.66	30.03
Vadodara	February	2756	610	22.13	30.03
Vadodara	March	2522	759	30.10	30.03
Vadodara	April	2499	862	34.49	30.03
Vadodara	May	2256	868	38.48	30.03
Vadodara	June	1807	703	38.90	30.03
Mysore	January	2129	172	8.08	11.23
Mysore	February	2290	183	7.99	11.23
Mysore	March	2194	208	9.48	11.23
Mysore	April	2072	236	11.39	11.23
Mysore	May	2270	349	15.37	11.23
Mysore	June	2203	329	14.93	11.23
Kochi	January	5660	795	14.05	22.40
Kochi	February	5372	1005	18.71	22.40
Kochi	March	6213	1348	21.70	22.40
Kochi	April	6515	1576	24.19	22.40
Kochi	May	6222	1853	29.78	22.40

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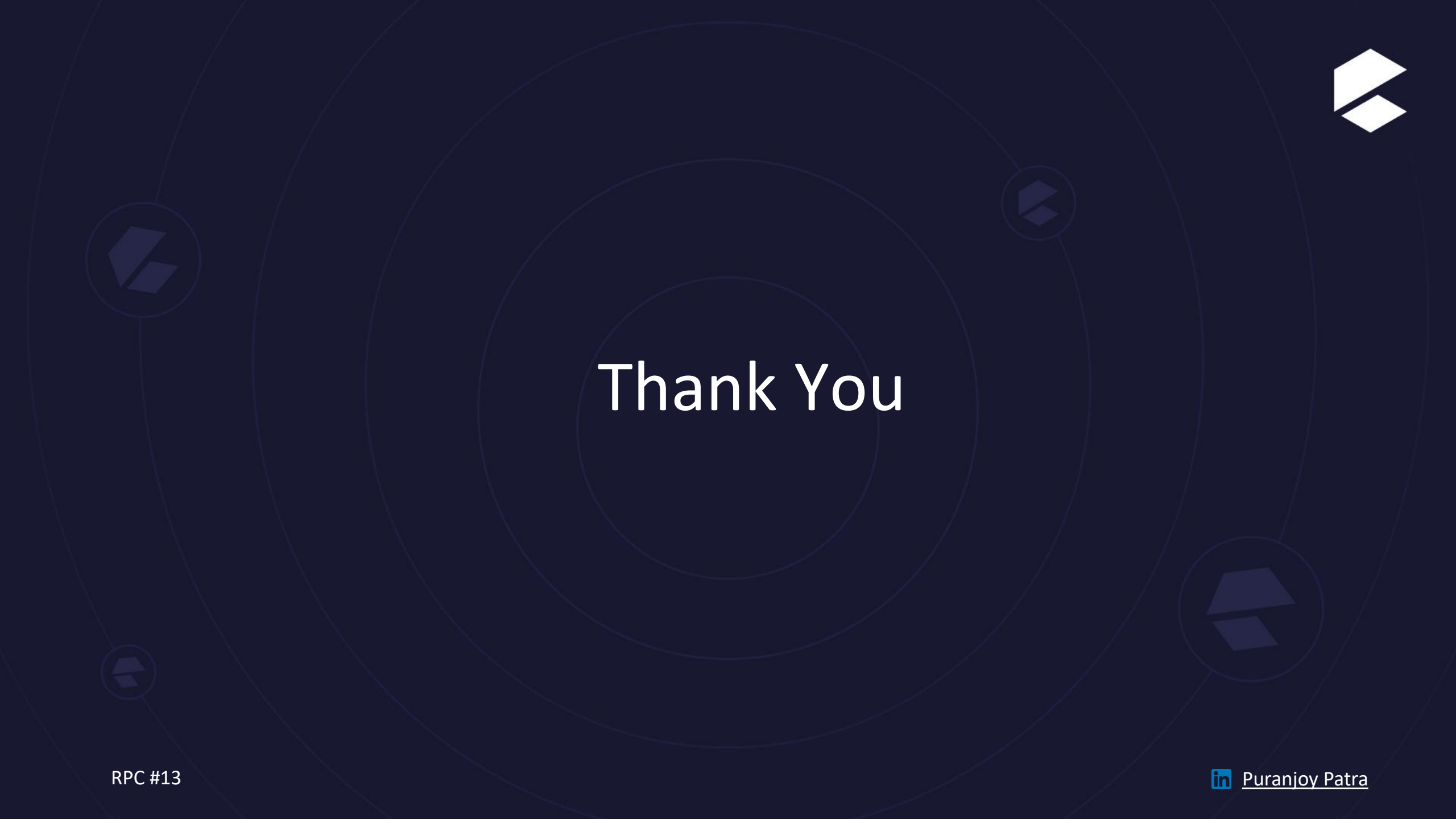

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