

From Orders to Insights: Predicting Demand and Optimizing Cuisine for Swiggy

By Kushal Shah

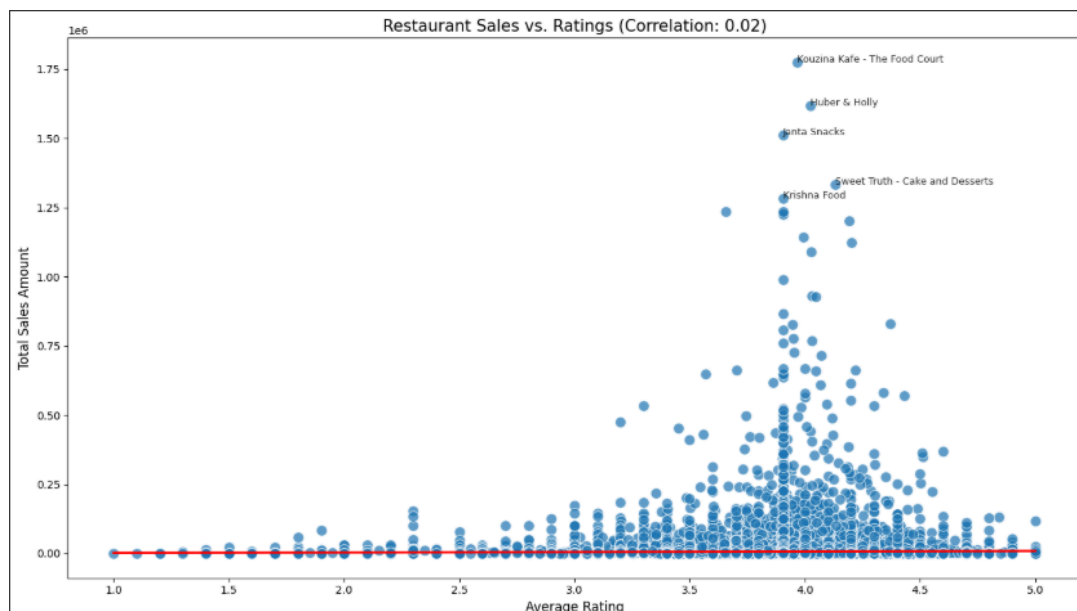
Intro:

This project focuses on uncovering data-driven insights from Swiggy's food delivery records. Using a cleaned dataset of 100,000 orders, the goal is to solve two real-world business problems:

1. Demand Forecasting – predicting future order volumes to improve inventory and staffing.
2. Cuisine Optimization by City – identifying which cuisines perform best in specific cities to guide strategic menu decisions.

By applying techniques like time series forecasting, correlation analysis, and city-wise aggregation, the project provides actionable recommendations to enhance Swiggy's operational efficiency and customer satisfaction.

1: *What does the scatter plot reveal about the relationship between restaurant ratings and total sales amount on Swiggy*



2: *Top 10 Restaurants by Sales Volume:*

Top 10 Restaurants by Sales Volume:

	name	sales_amount	rating
36040	Kouzina Kafe - The Food Court	1774735	3.966089
30124	Huber & Holly	1618439	4.025000
32397	Janta Snacks	1510944	3.905141
63936	Sweet Truth - Cake and Desserts	1332118	4.131358
36161	Krishna Food	1284102	3.905141
50312	Pizza Hut	1236502	3.655933
74775	ZAATAR SPICE	1235347	3.905141
47115	Odeon Gupta Paan Palace	1228148	3.905141
11623	CHAI THELA	1224144	3.905141
19754	Domino's Pizza	1201303	4.192416

3: *Top 10 city cuisine combinations*

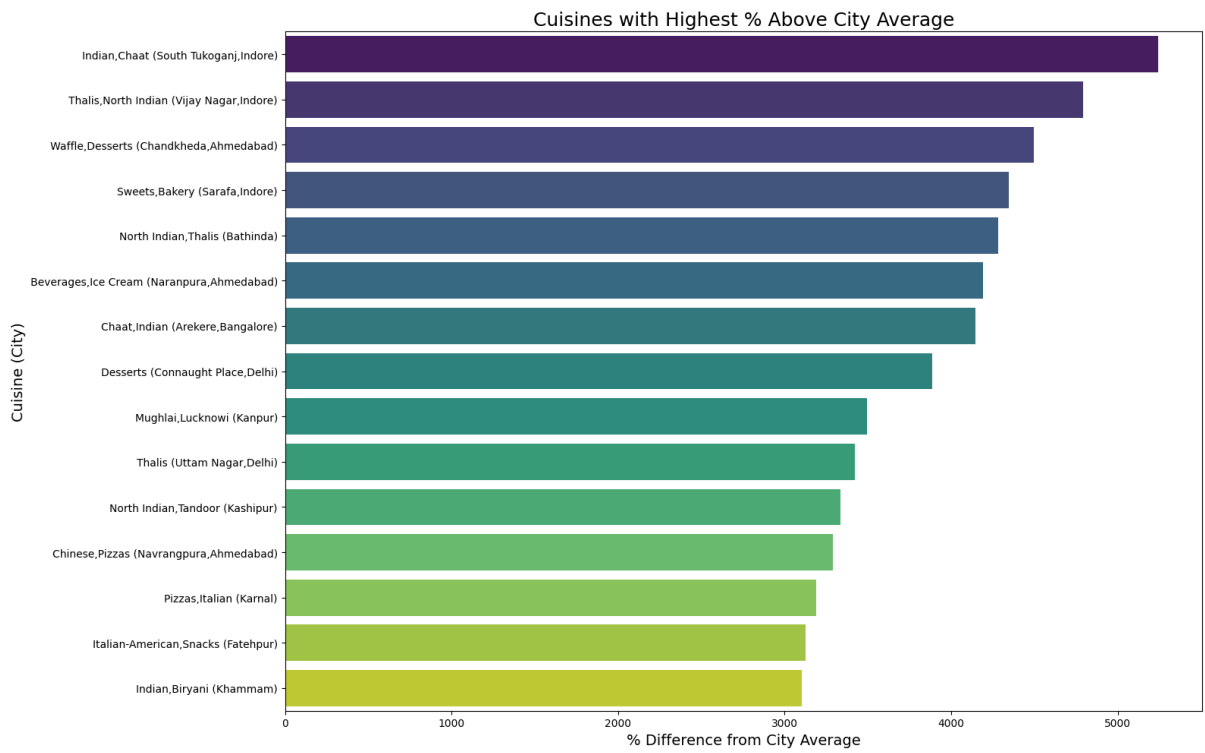
	city	cuisine
11140	Connaught Place, Delhi	Desserts
9793	Chandkheda, Ahmedabad	Waffle, Desserts
31539	Navrangpura, Ahmedabad	Chinese, Pizzas
15839	Ghatlodia, Ahmedabad	Sweets
13473	Electronic City, Bangalore	Pizzas, Chinese
15739	Ghatlodia, Ahmedabad	Chinese, Combo
14206	Fatehpur	Italian-American, Snacks
31665	Navrangpura, Ahmedabad	Street Food, Indian
15801	Ghatlodia, Ahmedabad	North Indian, Punjabi
15401	Gaya	Chinese, Italian

4: *Cuisine with Consistently Higher Preference*

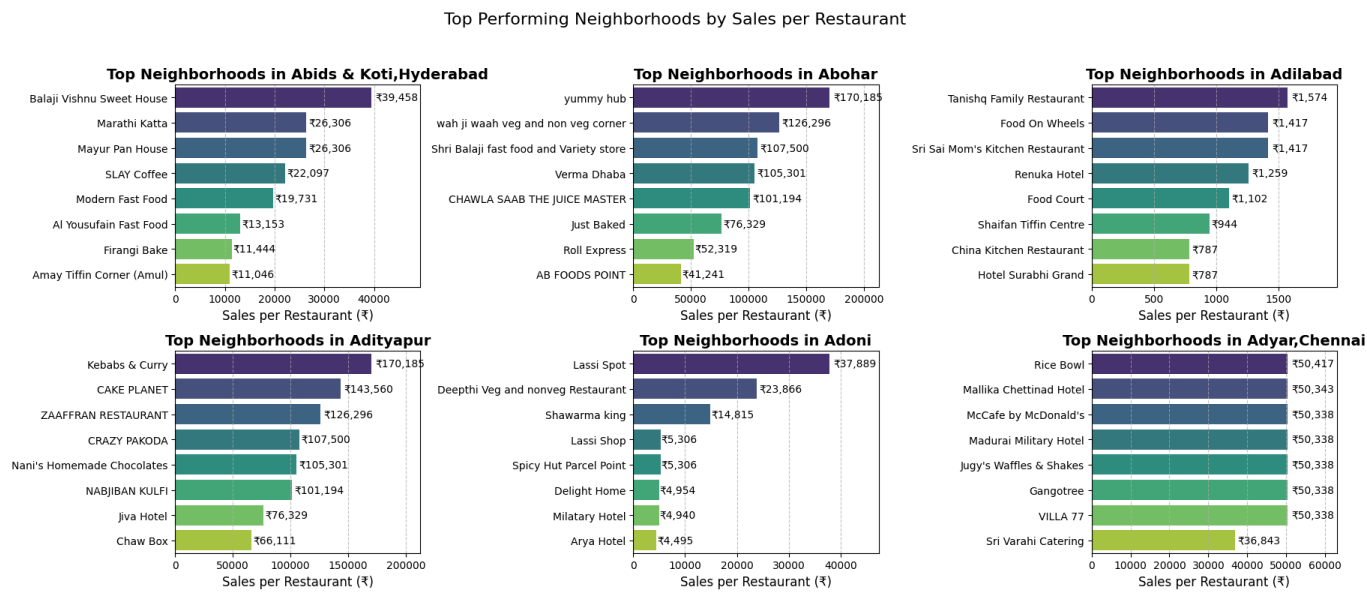
Cuisines with Consistently Higher Order Values Across Cities:

	mean	std
cuisine		
Lebanese, Burgers	25.772256	1.304100
Korean, Beverages	17.930230	6.260390
Beverages, Paan	35.719903	15.403080
Sushi, Chinese	76.111676	18.814038
Indian, Pan-Asian	19.319804	21.491884
Italian-American, North Indian	16.743770	25.447680
Street Food, Tandoor	59.101427	28.122759
Oriental, Italian	27.875266	53.670926
Hyderabadi, Andhra	50.702089	56.323065
Lebanese, Italian-American	672.115711	60.955418

5: Cuisines with Highest% above city average



6: Group of Top Performing Restaurants by sales value in the cities



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Aizawl:
Hotel Chhungte International: ₹213,449 (1 restaurants, 3.9 avg rating)
Alpha Pizza House: ₹32,116 (1 restaurants, 3.9 avg rating)
Ilmov Foods: ₹18,528 (1 restaurants, 3.9 avg rating)
Aizawl Luncheonette: ₹8,750 (1 restaurants, 3.9 avg rating)
Hallelujah Kitchen: ₹5,111 (1 restaurants, 3.9 avg rating)

Ajmer:
Gangaur Pizza Point: ₹142,301 (1 restaurants, 3.6 avg rating)
CJ Cafe (Coffee Jar): ₹121,088 (1 restaurants, 3.9 avg rating)
GIRDHARI kichan: ₹78,769 (1 restaurants, 3.9 avg rating)
Lungi A Cafe From South India: ₹71,148 (1 restaurants, 3.7 avg rating)
For Heavens Cake: ₹65,972 (1 restaurants, 3.9 avg rating)

Akola:
The Dream Meets Cafe: ₹30,241 (1 restaurants, 3.9 avg rating)
HARSHA CHINESE AND CAKE SHOP: ₹26,255 (1 restaurants, 3.9 avg rating)
Shahi Biryani: ₹26,255 (1 restaurants, 3.9 avg rating)
Akola Paratha House: ₹25,838 (1 restaurants, 3.9 avg rating)
The Divine Kitchen: ₹24,218 (1 restaurants, 3.9 avg rating)

Alappuzha:
Cafe Pumpkin: ₹313,472 (1 restaurants, 3.6 avg rating)
Caffe Di Venezia: ₹212,713 (1 restaurants, 3.9 avg rating)
Domino's Pizza: ₹113,259 (1 restaurants, 4.3 avg rating)
The Krispy House: ₹107,852 (1 restaurants, 4.3 avg rating)
Al Wafa: ₹71,148 (1 restaurants, 3.5 avg rating)

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7: Top 5 Frequently Ordered Items

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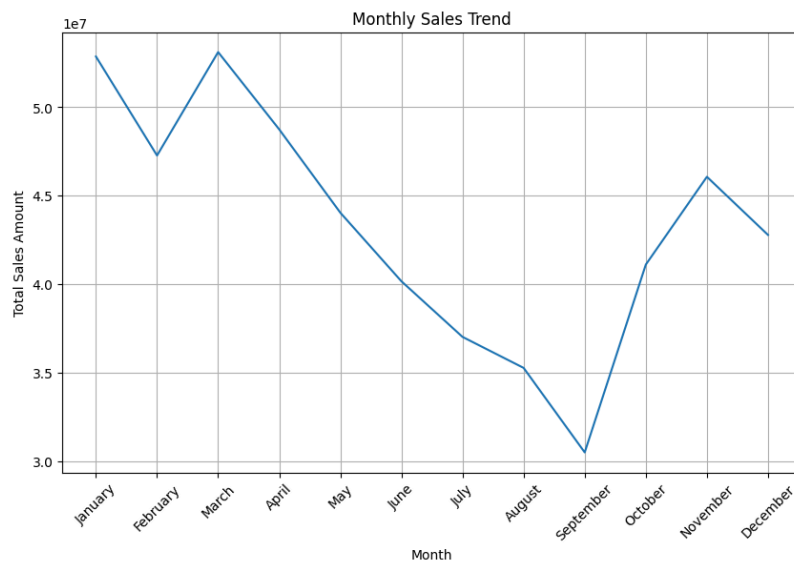
Top 5 most frequently ordered items:
item
Burmese Spaghetti    2
Masala Omlet         2
Veg Paneer Roll      2
Hong Kong Rice       2
Biryani              2
Name: count, dtype: int64

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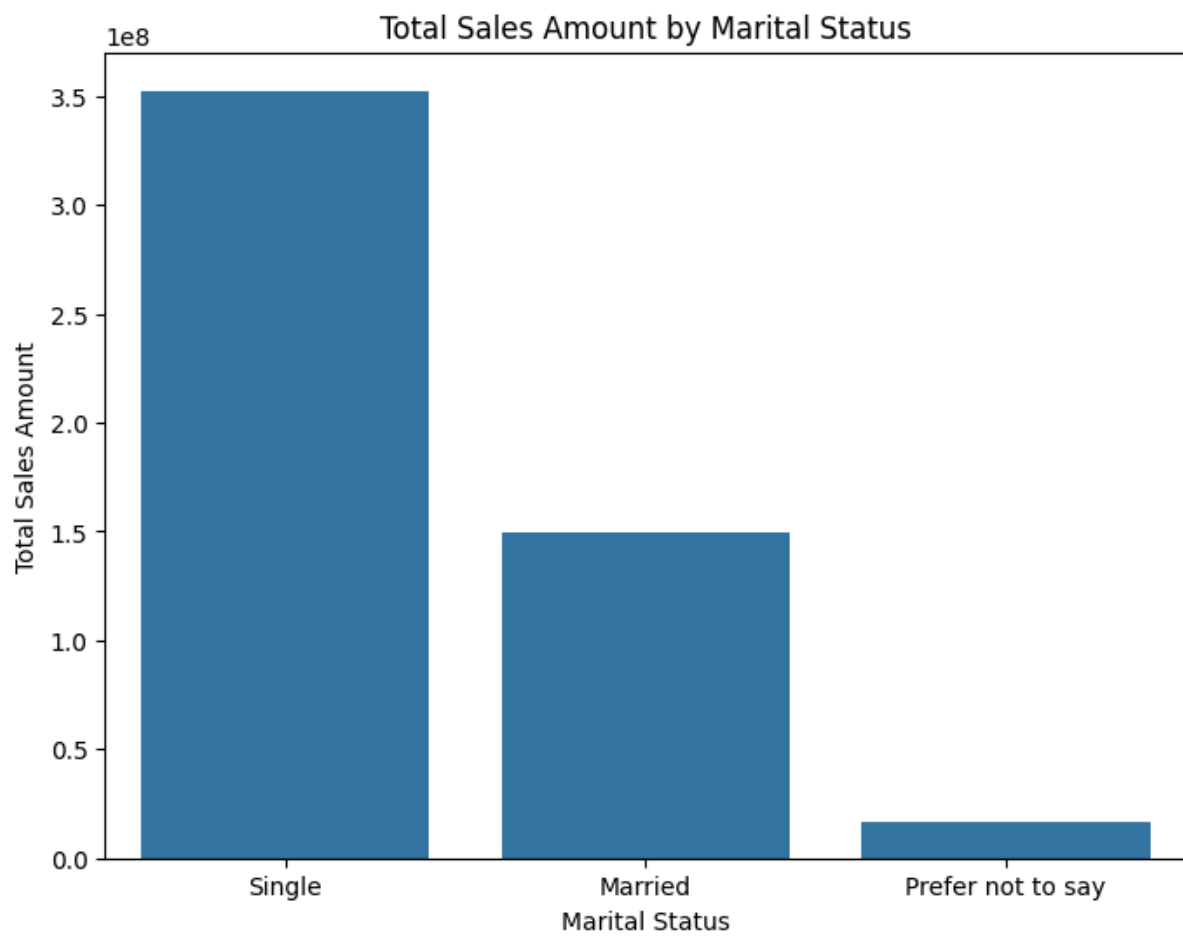
8: Average Rating Of All Resto

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Average rating of restaurants: 3.90514081145584
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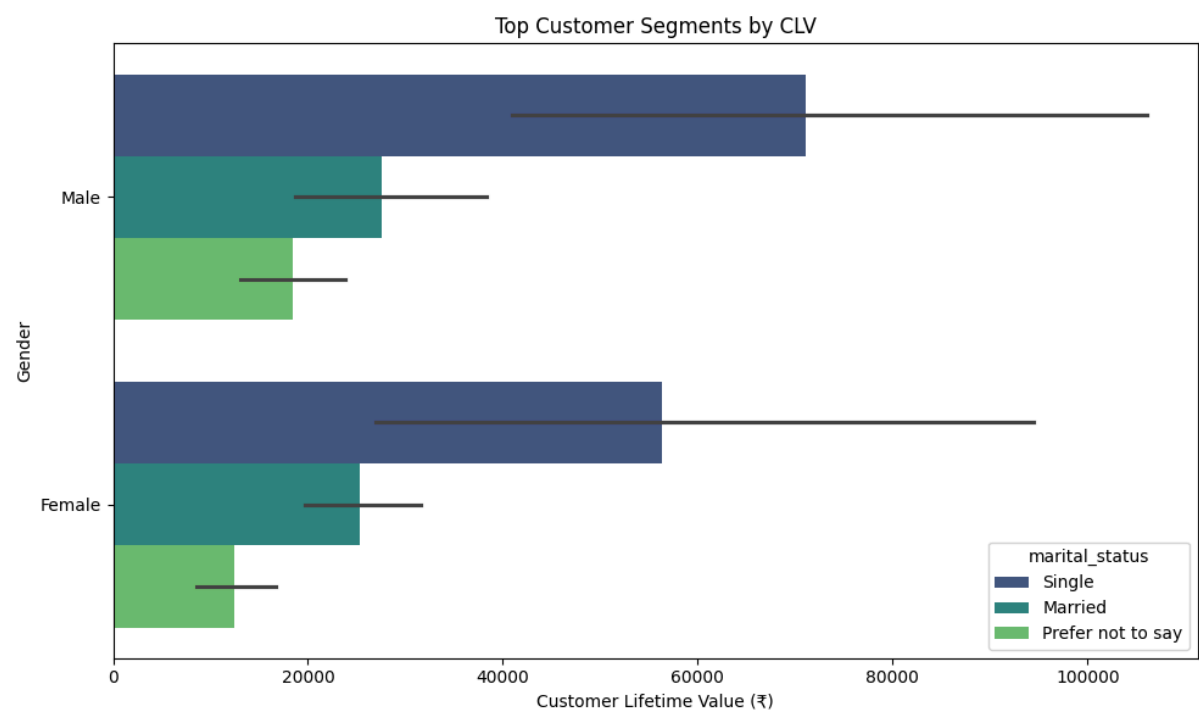
Monthly Sales Trends



9: Total Sales Amount Based on Marital Status



10: Customer Lifetime Value



11: Overall Average Order Value With Cities And Cuisines

Overall AOV: ₹ 5189.35947

Top 5 City-Cuisine Combinations by AOV:

	city	cuisine	aov	order_count
11140	Connaught Place,Delhi	Desserts	1228148.0	1
9793	Chandkheda,Ahmedabad	Waffle,Desserts	996102.0	1
31539	Navrangpura,Ahmedabad	Chinese,Pizzas	970130.0	1
15839	Ghatlodia,Ahmedabad	Sweets	970130.0	1
13473	Electronic City,Bangalore	Pizzas,Chinese	760255.0	1

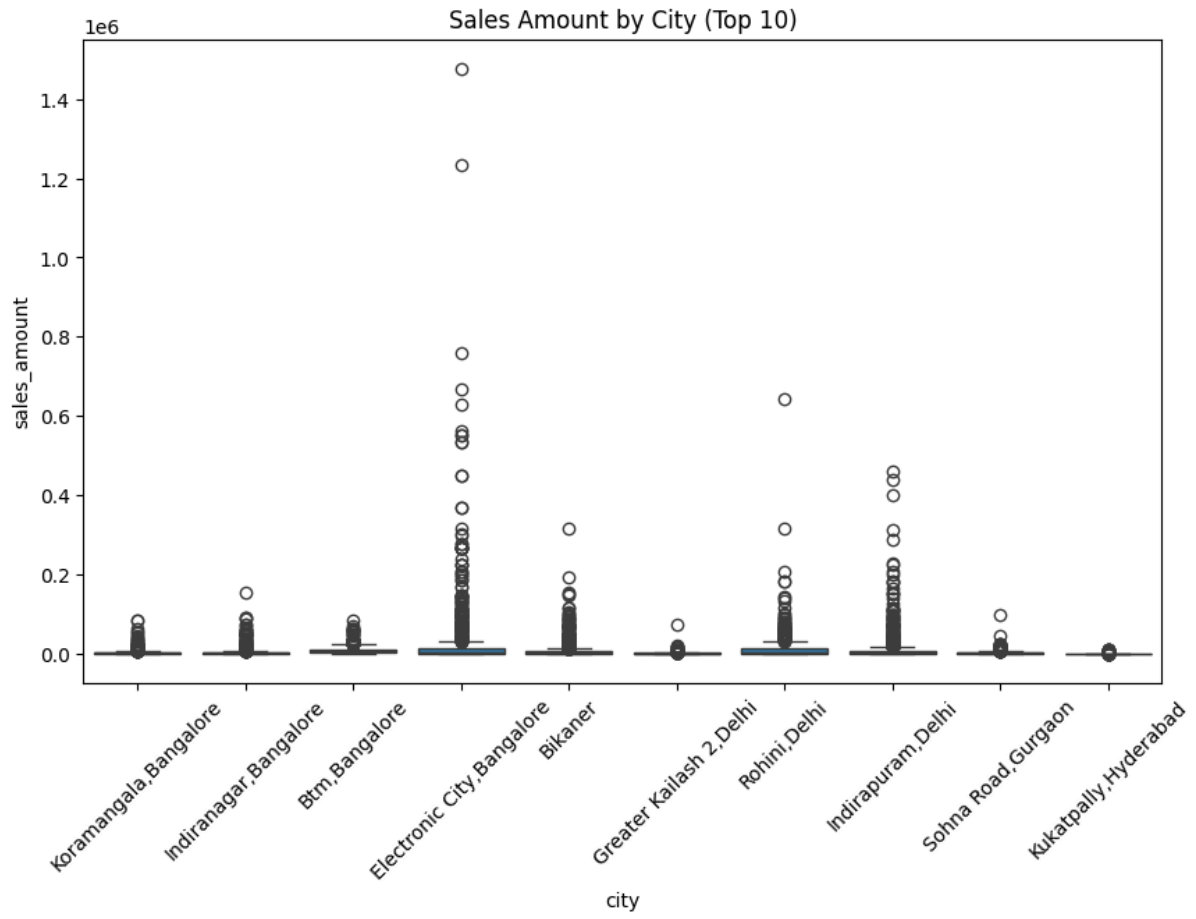
12: Top Performing Cities

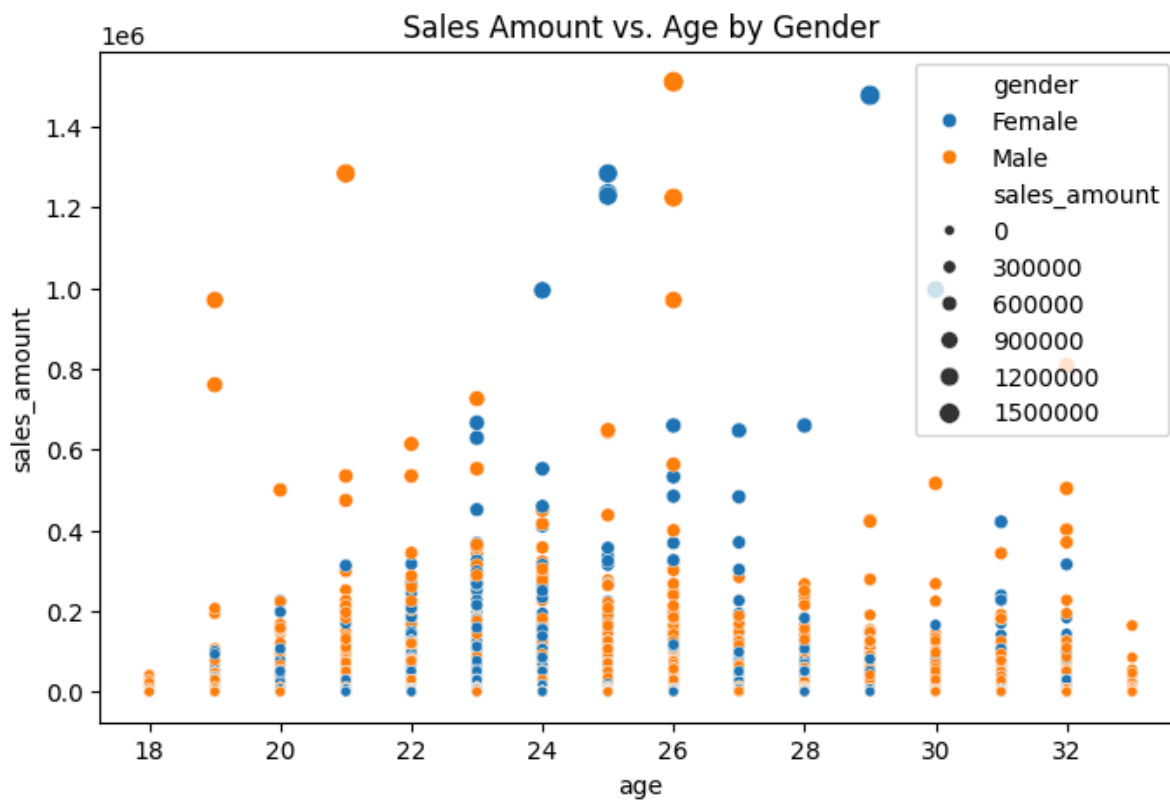
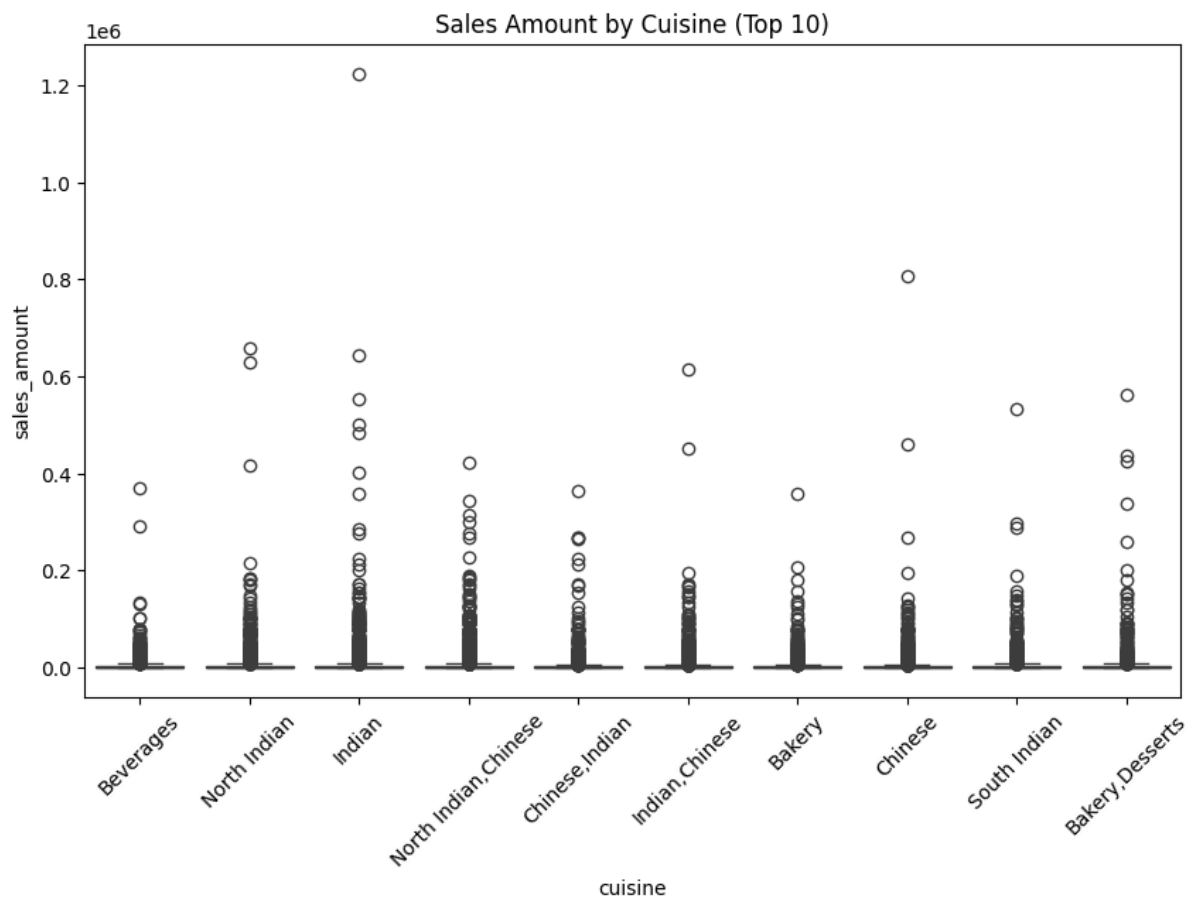
Top Performing Cities by Revenue:

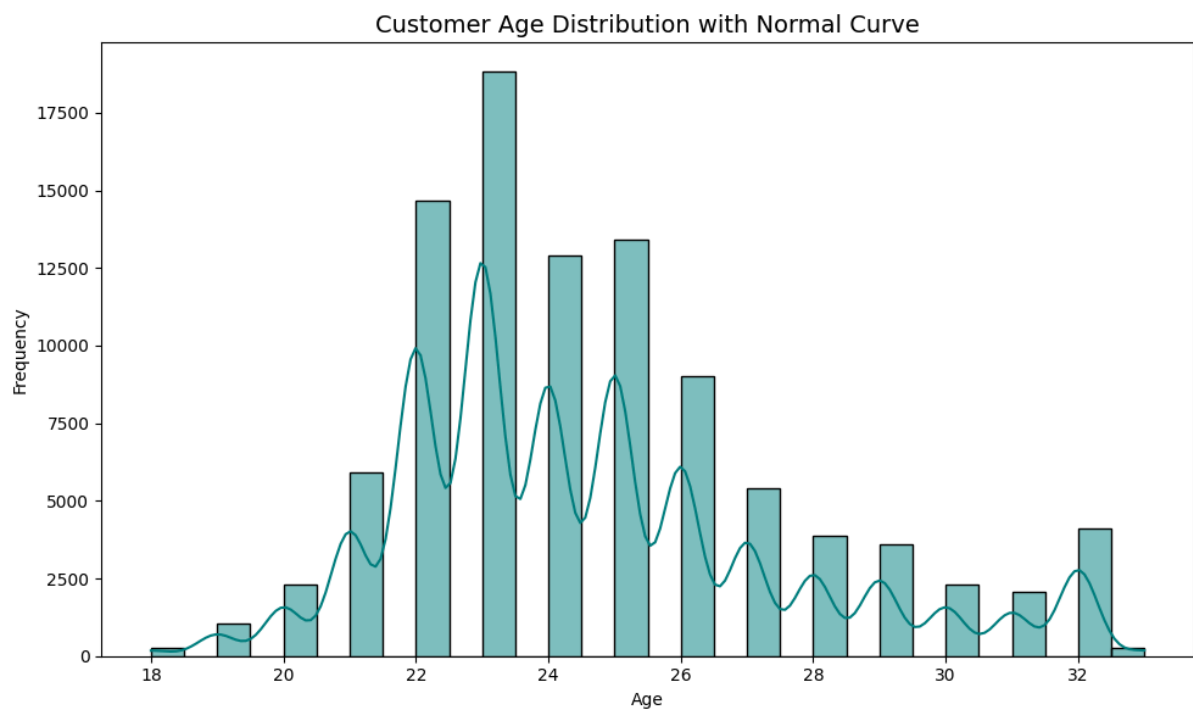
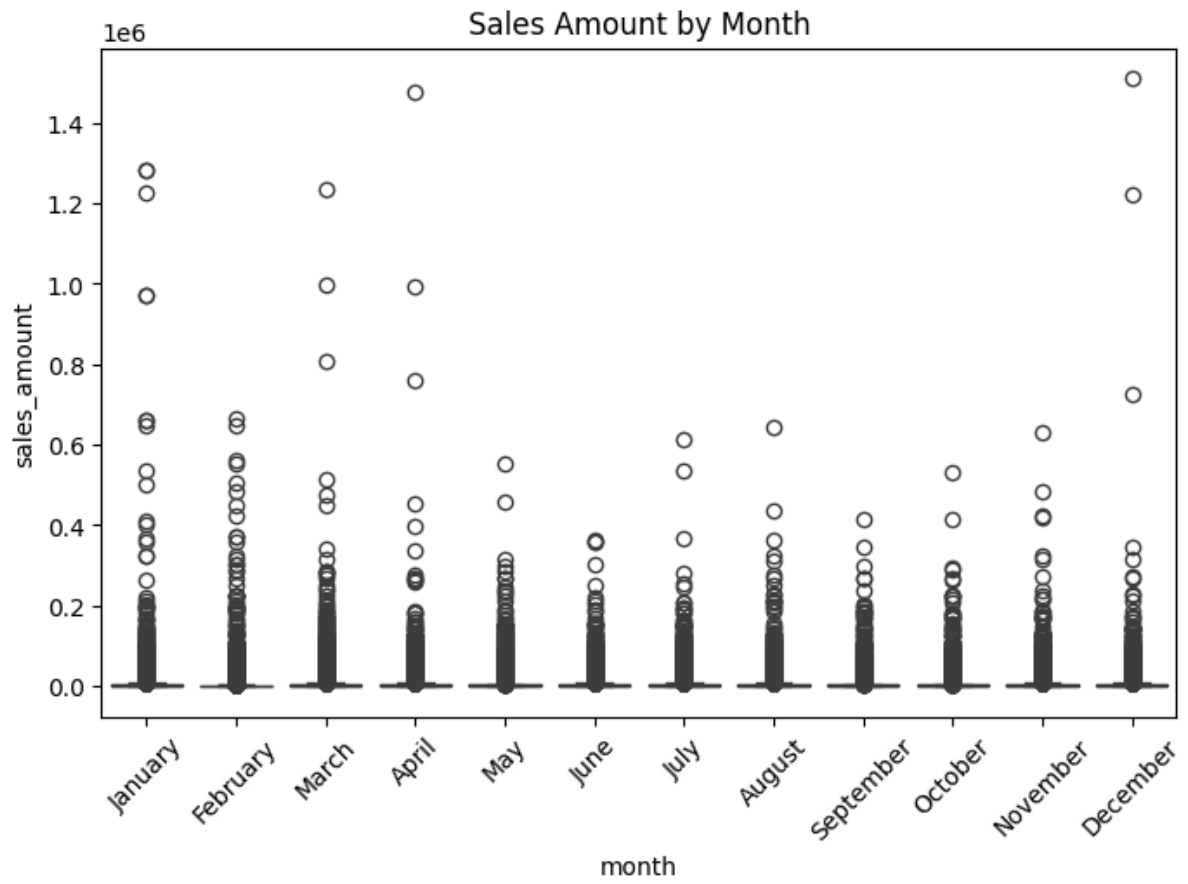
	state	city	total_revenue	aov	\
2378	Karnataka	Electronic City,Bangalore	5672707	28363.535000	
4384	Uttar Pradesh	Indirapuram,Delhi	2868235	10864.526515	
1335	Delhi	Rohini,Delhi	1727951	16614.913462	
2422	Karnataka	Electronic City,Bangalore	1714435	25976.287879	
1631	Gujarat	Chandkheda,Ahmedabad	1703749	46047.270270	

	active_days	avg_rating	restaurant_count	orders_per_restaurant	\
2378	175	3.941381	200	1.0	
4384	204	3.918572	264	1.0	
1335	98	3.895647	104	1.0	
2422	61	3.894959	66	1.0	
1631	34	3.883380	37	1.0	

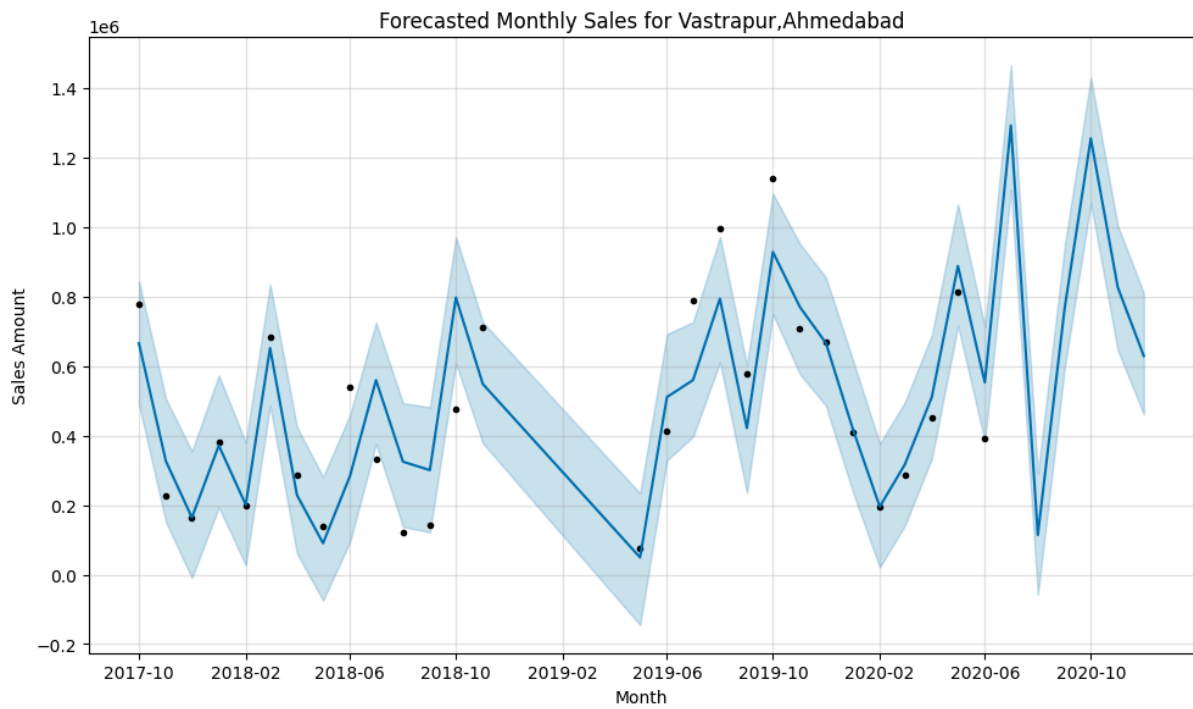
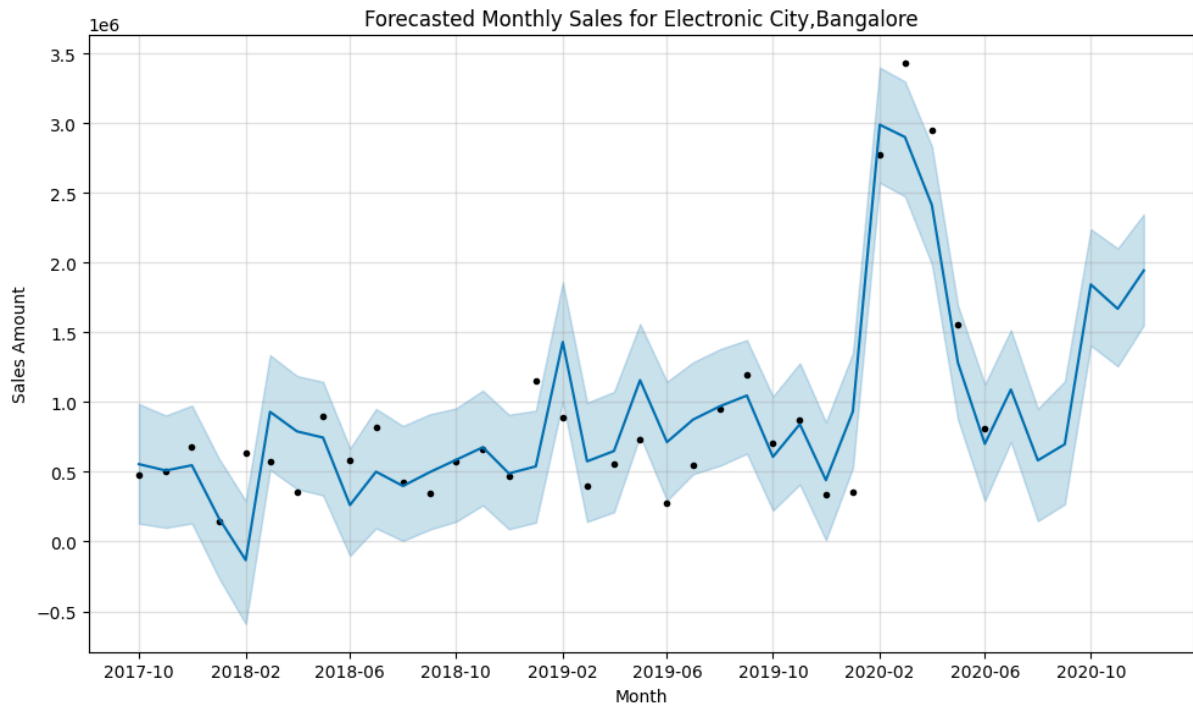
	revenue_density
2378	28363.535000
4384	10864.526515
1335	16614.913462
2422	25976.287879
1631	46047.270270







Made A Forecasting Model



Part 4.1: Trained Random Forest model
Part 4.2: Made predictions on test set
Part 4.3: Model Performance
Mean Squared Error: 580669282.31
R^2 Score: 0.01

Part 4.4: Feature Importance

	Feature	Importance
6	cuisine_encoded	0.225005
1	age	0.125339
3	pincode	0.096075
5	city_encoded	0.088778
0	rating	0.081741
2	month_num	0.077229
4	year	0.073785
10	month_encoded	0.068949
11	state_encoded	0.062921
9	occupation_encoded	0.038063
8	marital_status_encoded	0.033039
7	gender_encoded	0.029077

Part 4.4: Saved feature importance plot

Part 4.4: Saved feature importance to CSV