Advanced SQL Analytics and Data Visualization on Restaurant Orders

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Project Objectives

- Perform Exploratory Data Analysis (EDA) to get familiar with the dataset: its size, shape, data types, and structure.
- Perform advanced SQL analytics on restaurant order data to derive business insights using MySQL.
- Perform comprehensive analysis of customer order data across multiple restaurant cuisines using Power BI.
- To uncover actionable insights that can inform strategic decisions in restaurant operations, marketing, and customer engagement.

Data Preparation & Setup

- Database: project2
- Table: orders
- Fields: Order ID, Customer Code, Placed At, Restaurant ID, Cuisine, Order Status, Promo Code
- Data Volume: 60+ sample records with diverse cuisines and promo usage

Tools Used: MySQL, Power BI

Business Questions Addressed via SQL

- Utilized advanced SQL techniques including **aggregate functions, window functions, joins, subqueries, conditional logic, sorting, date/time operations, and data filtering** to address and solve key business scenarios outlined in the analysis.

  - Top 3 Restaurants per Cuisine: Identified using ROW_NUMBER() over partitioned cuisine groups.
  - Daily Customer Metrics: Tracked total and new customers per day using nested queries and date comparisons.
  - One-Time January Customers: Customers who ordered only once in Jan 2025 and never again.
  - Dormant Customers: Customers with no orders in the last 7 days but acquired via promo a month ago.
  - Every 3rd Order Tracker: Used to trigger personalized messages after every 3rd order.
  - Promo-Only Loyal Customers: Identified customers who placed multiple orders, all with promo codes.
  - Promo-Free First Orders: Calculated percentage of customers acquired without using a promo code.

Key Metrics Derived Using Advanced SQL

Below listed metrics extracted for each cuisine.

Total Orders	Weekend Orders	Week Orders	% of weekend orders	Promo orders	% of promo orders

GitHub repository

Link to view SQL query script

Link to view query outputs

Power BI Visualization for Key Insights

- Leveraged Power BI capabilities to create calculated columns and measures using **DAX** functions. Developed a **variety of visualizations** including line and stacked column charts, stacked bar charts, ribbon charts, matrix tables, KPI cards, pie charts, and donut charts to effectively communicate key insights and performance indicators.

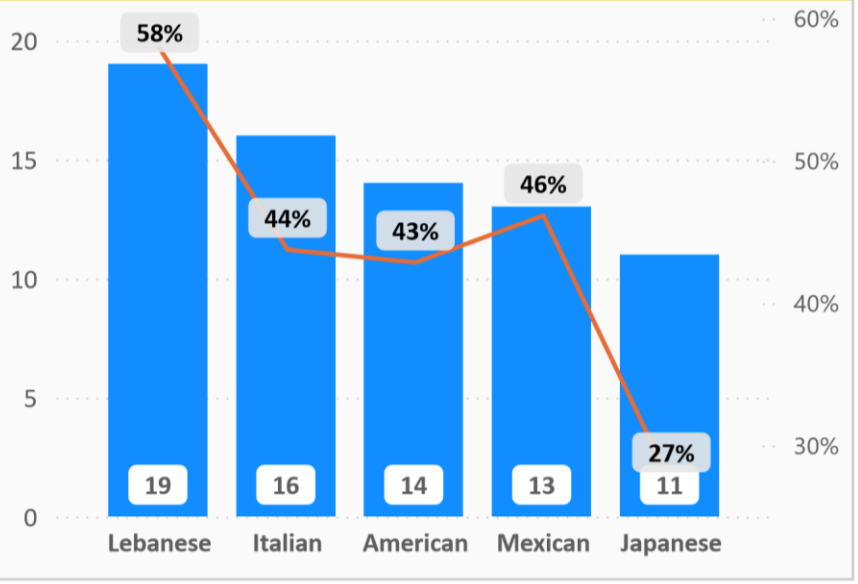
The analysis focus on:

- **Identifying the most popular cuisines** based on order volume.
- **Evaluating the effectiveness of promotional codes** across different cuisines and customer segments.
- **Analyzing restaurant-level performance** in terms of order count and promotional uptake.
- **Understand customer behavior patterns**, including order frequency, cuisine diversity, and promo code adoption.
- **Track order trends over time**, including weekly and weekend-based variations.
- **Support data-driven decision-making** for marketing, menu optimization, and customer retention strategies.

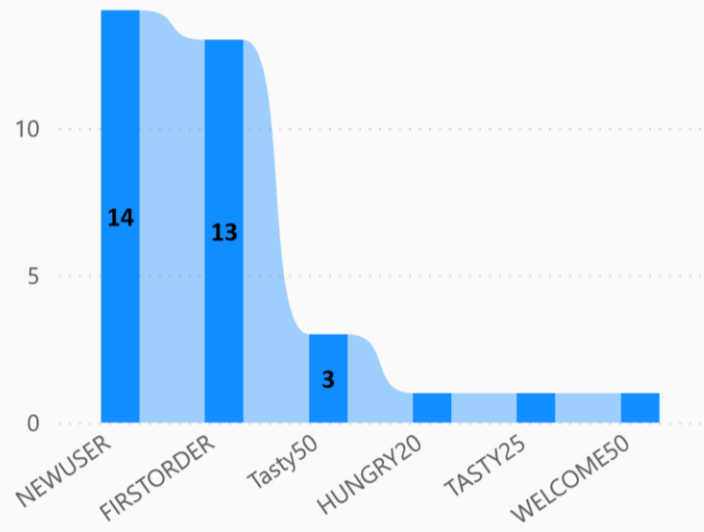
Link to view .pbix file

Dataset Exploratory Data Analysis (EDA) Overview

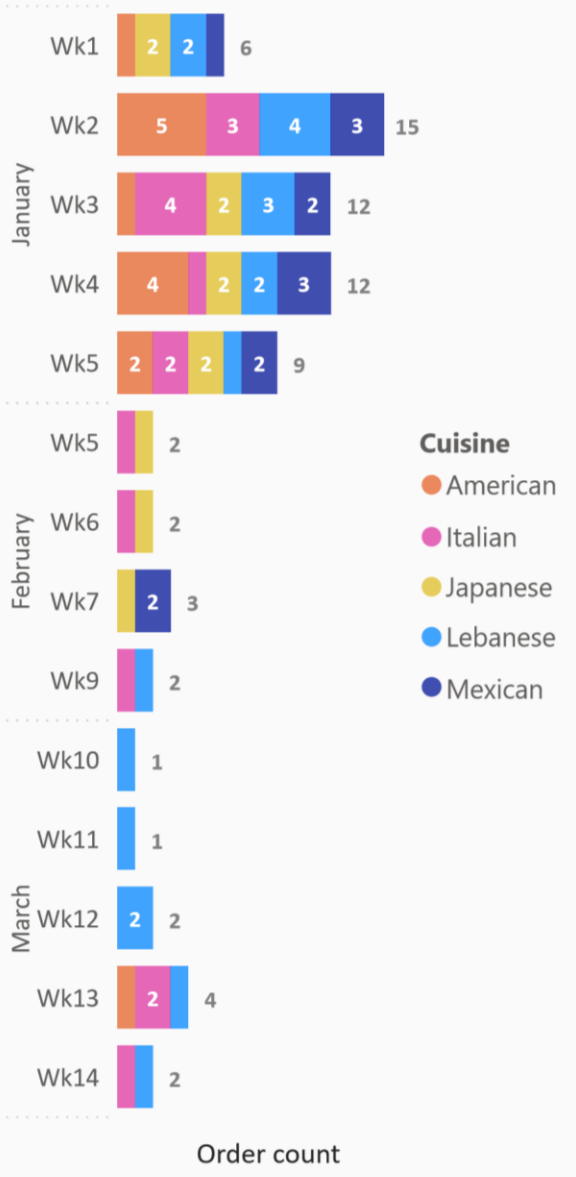
Cuisine wise promo orders trend



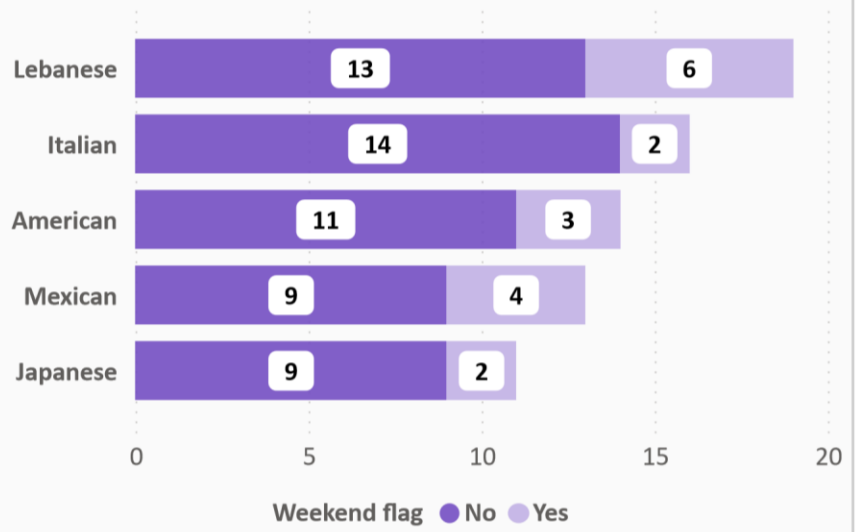
Promo code wise Order volume



Week and Cuisine wise order volume



Cuisine wise orders by weekend flag



Cuisine and Restaurant wise orders

Cuisine Name	Restaurant_id	Order count	Promo Orders %
Italian	PIZZA123	10	50%
Lebanese	KMKMH6787	10	80%
Lebanese	LEBANESE2	9	33%
American	BURGER99	8	13%
Mexican	TACO789	7	29%
American	AMERICAN2	6	83%
Italian	ITALIAN2	6	33%
Japanese	SUSHI456	6	33%
Mexican	MEXICAN2	6	67%
Japanese	JAPANESE2	5	20%
Total		**73**	**45%**

73
Total Orders

47
Total Customers

5
Total Cuisines

10
Total Restaurants

45%
Promo Orders %

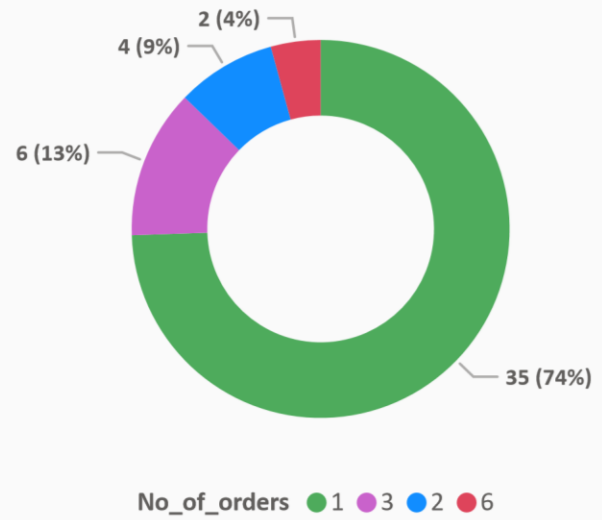
17
Weekend Orders

Deep dive: Customer – Cuisine – Promo / Weekend Order Pattern

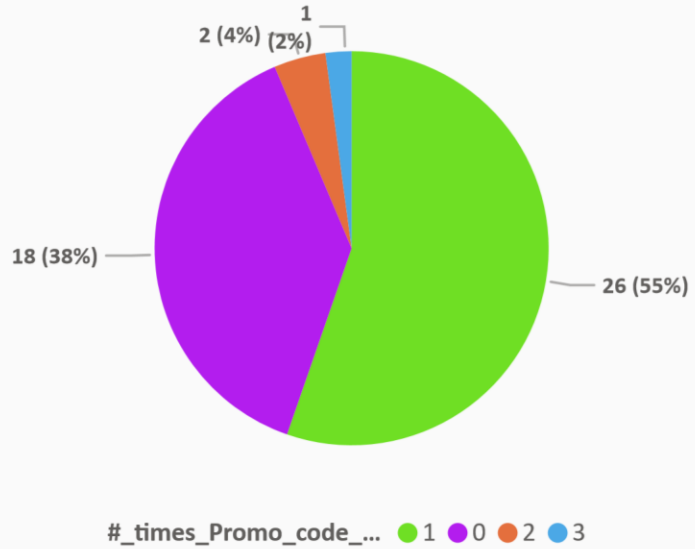
Cuisine and Restaurant wise orders

Customer_code	No of Orders	No of Cuisines	Weekend orders	Promo Orders %
MULTI_CUISINE_CUST	6	3	2	17%
UFDDN1991918XUY1	6	3		33%
ABC9876543210MNO	3	2	1	33%
LAST_ORDER_7DAYS	3	1		33%
PROMO_FIRST_ONLY	3	1	1	33%
THIRD_ORDER_CUST1	3	1	1	33%
THIRD_ORDER_CUST2	3	1		33%
UVW7890123456JKL	3	2	1	100%
ABC1234567890XYZ	2	2	1	50%
CDE3456789012GHI	2	2	1	
DEF9876543210XYZ	2	2	1	100%
NO_ORDER_RECENT	2	1	1	50%
BCD7890123456ABC	1	1		100%
DEF5678901234MNO	1	1		
EFG1234567890DEF	1	1	1	
FGH7890123456GHI	1	1		100%
GHI3456789012MNO	1	1		
GHI5678901234XYZ	1	1		100%
HIJ9876543210DEF	1	1	1	100%
IJK1234567890JKL	1	1		
JAN_ONLY_ORDER1	1	1		100%
JAN_ONLY_ORDER2	1	1		100%
JKL3456789012XYZ	1	1	1	100%
JKL7890123456MNO	1	1		100%
KLM5678901234DEF	1	1		
LMN9876543210JKL	1	1		100%
MNO1234567890PQR	1	1		
MNO7890123456XYZ	1	1	1	
NO_ORDER_LAST7_1	1	1	1	100%
Total	**73**	**5**	**17**	**45%**

Distribution of Customer - Order Volume



Distribution of Customer - Promo code applied



47
Total Customers

29
Promo Customers

Cuisine
- American
- Italian
- Japanese
- Lebanese
- Mexican

Restaurant
All

Ordered Week
All

Month
All

Summary of Analytical Insights

🍽️ Cuisine & Restaurant Insights

- Top Ordered Cuisines:
  - Lebanese (19 orders)
  - Italian (16)
  - American (14)
  - Mexican (13)
  - Japanese (11)
- Promo Order % by Cuisine:
  - Lebanese: 58%
  - Italian: 27%
  - American: 43%
  - Mexican: 46%
  - Japanese: 44%
- Top Restaurants by Orders:
  - PIZZA123 (Italian) and KMKMH6787 (Lebanese): 10 orders each
  - LEBANESE2: 9 orders
  - BURGER99: 8 orders

📅 Time-Based Trends

- Weekend Orders: 17 out of 73 total orders (~23%)
- Cuisine Preference on Weekends:
  - Lebanese and Italian are most popular on weekends
  - Japanese and Mexican have fewer weekend orders
- Weekly Order Volume:
  - Peak in Week 2 (15 orders) and Week 3 (12 orders)
  - Noticeable drop after Week 5

🎁 Promo Code Usage

- Most Used Promo Codes:
  - NEWUSER: 14 orders
  - FIRSTORDER: 13 orders
  - Others like Tasty50, HUNGRY20, WELCOME50 had fewer uses.
- Promo Orders: 45% of total orders (29 out of 73)
- Customers Using Promo Codes:
  - 55% used a promo once
  - 38% didn't use any
  - A few used promos multiple times

👥 Customer Behavior

- Customer Distribution by Order Volume:
  - 74% of customers placed only 1 order
  - 13% placed 3 orders
  - Only 4% placed 6 orders
- Multi-Cuisine Customers:
  - Some customers ordered from 2–3 cuisines, indicating diverse preferences

Strategic Takeaways:

✓ **Lebanese cuisine** is the most popular and has the highest promo usage.

✓ **Promo codes** significantly influence order volume.

✓ **Customer retention** is low — most customers order only once.

✓ **Weekend orders** are relatively low, suggesting an opportunity for targeted weekend promotions.