

# Restaurant Order Analytics

## In this project,

we worked on **analyzing** restaurant order data to gain better insights into how customers behave while ordering food. Our aim was to figure out a few simple but useful things:

- Which dishes are ordered most often
- What time of the day people usually place orders (breakfast, lunch, dinner)
- How customers rate their experience with food and delivery
- Which payment methods are used most frequently

We wanted to turn this raw data into a clean, meaningful, and interactive dashboard that could help restaurant managers make better decisions.

## Importing the Data in Python

We started with two Excel files:

1. One file had detailed information about each food order (items, amount, time, payment, etc.)
2. The second file contained restaurant-level details (restaurant name, type, cuisine, zone, etc.)

Using Python, especially the **Pandas** library, we loaded both files into Jupyter Notebook. This helped us view and explore the data in table format before cleaning or analyzing it.

Importing in Python also allowed us to manipulate the data easily — like filtering, joining, and modifying columns.

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## Step 2: Data Cleaning

The data was real-world, so it wasn't perfect. We noticed issues like:

- Some rows had missing values (blanks)
- Some columns weren't useful (like index or repetitive IDs)
- Dates and times were in text format
- Column names were inconsistent (spaces, capital letters, etc.)

To clean this:

- We dropped duplicate and null rows to ensure only useful records remained
- We renamed columns to follow a clean format: all lowercase and no spaces (e.g., `order_date` instead of `Order Date`)

- We converted date columns into proper datetime format using `pd.to_datetime()`
- Then, we **joined** both datasets (orders + restaurants) using `restaurant_id` so all order info could be matched with restaurant info

Finally, we saved this cleaned and merged dataset as a CSV file (`Cleaned_Restaurant_Orders.csv`), which was ready for dashboard use.

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### Step 3: Creating the Dashboard in Power BI

After cleaning the data, we moved on to creating the visual dashboard using **Power BI**.

Here's what we did:

1. **Imported the cleaned CSV** into Power BI Desktop.
2. Used **DAX** (Data Analysis Expressions) to create a new column called **Meal Time**, which split orders into categories like Breakfast, Lunch, and Dinner based on the time of order.
3. We **unpivoted** the customer rating columns so we could compare **Food Rating** vs **Delivery Rating** in a single chart.
4. Built multiple visuals for better insights:
  - **Top Restaurants by Orders** – to show which restaurants had the most orders
  - **Customer Rating Comparison** – to compare satisfaction for food and delivery
  - **Revenue by Meal Time** – to find out which time of day earns more
  - **Payment Method Breakdown** – to understand how customers prefer to pay
5. Added interactive **filters** such as:
  - Order Month
  - Cuisine Type
  - Zone (A/B/C/D)
  - Customer Category (Pro or Ordinary)
  - Meal Time (Breakfast/Lunch/Dinner)

These visuals made it easier to explore the data and find patterns.

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### Outcome

The final dashboard was clean, informative, and interactive. From it, we could clearly see:

- Which dishes and restaurants are most popular
- When people usually place their orders (Lunch was the most revenue-generating)
- How customers rate food and delivery (food usually gets higher ratings than delivery)

- Credit card and debit card are the most preferred payment methods
- Zone D has the highest number of orders, especially for South Indian food

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This project taught us how to work with real-life datasets, clean and prepare them using Python, and create professional dashboards using Power BI. It helped us understand how data can be turned into insights that support better business decisions.

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