Restaurant Sales Analysis

1. Introduction

1.1. Domain Background

The restaurant and food service industry is one of the most dynamic sectors in the global economy. Businesses in this industry continuously strive to improve profitability, optimize menu performance, and enhance customer satisfaction. With the growing importance of data-driven decision-making, analytics tools like Power BI allow restaurants to visualize trends, track performance, and identify opportunities for improvement in real time.

1.2. Dataset Description

The **Restaurant Sales Dataset** used in this project contains transactional data representing restaurant orders.

- **Dataset Size:** 1,111 records (representing total quantity sold)
- **Variables:** Includes fields such as *Order ID*, *Item Name*, *Category*, *Quantity*, *Price*, *Rating*, and *Date of Sale*.
- **Key Fields:**
    - Order ID – Unique identifier for each order
    - Item – Name of the item sold (e.g., Burger, Juice, Pasta)
    - Category – Type of food (e.g., Fast Food, Beverages, Main Course)
    - Sum of Price – Total revenue per item or category
    - Average Rating – Customer satisfaction measure (on a scale of 1 to 5)
    - Date – Day of transaction (used for trend analysis)

1.3. Objective

The primary objective of this project is to analyze restaurant sales data to uncover actionable insights that can help management make informed decisions. The analysis aims to answer the following key questions:

1. What is the total revenue, total quantity sold, and average rating for the restaurant?
2. Which food items and categories generate the highest revenue and sales volume?
3. How do daily sales fluctuate over time?
4. What are the major trends and performance insights across product categories?
5. What areas need improvement, particularly concerning customer satisfaction?

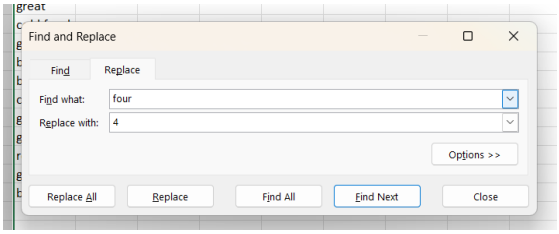
2. Data Preparation

The dataset contained several missing and unformatted values in key columns such as **Rating** and **Feedback**. Microsoft Excel and Power Query Editor were used to clean, transform, and prepare the data for analysis.

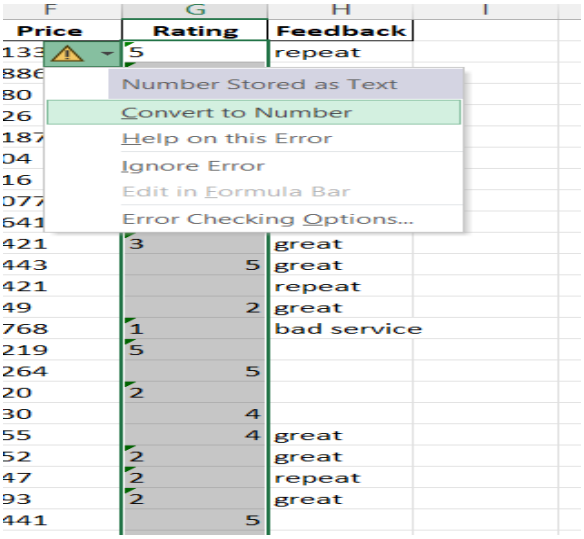
	A	B	C	D	E	F	G	H
1	OrderID	OrderDate	Item	Category	Quantity	Price	Rating	Feedback
2	R40000	13/01/202	burger	beverages	3	1133	5	repeat
3	R40001	28/06/202	steak	Fast Food	1	1886	5	cold food
4	R40002	Jan 15, 20	pasta	beverages	1	980		great
5	R40003	Jul 21, 202	salad	Main Course	2	726	four	great
6	R40004	19/06/202	juice	beverages	8	1187	2	cold food
7	R40005	11/10/202	steak	Main Course	5	104	four	great
8	R40006	12/02/202	steak	Beverages	5	316	1	bad service
9	R40007	2024-04-0	salad	Beverages	8	1077	2	bad service
10	R40008	2024-08-1	Salad	fast food	4	1641	5	cold food
11	R40009	13/03/202	Steak	Main Course	7	1421	3	great
12	R40010	May 10, 2(	burger	Beverages	6	1443	five	great
13	R40011	2024-09-1	pasta	beverages	3	1421		repeat
14	R40012	2023-01-0	salad	Fast Food	8	949	2	great
15	R40013	16/04/202	Pizza	Fast Food	7	1768	1	bad service
16	R40014	2023-07-2	pizza	Main Course	3	1219	5	
17	R40015	15/10/202	burger	fast food	1	1264	five	
18	R40016	Dec 03, 20	Pasta	beverages	3	320	2	
19	R40017	19/11/202	Pizza	Main Course	3	430	four	
20	R40018	Jun 28, 20	pizza	Fast Food	1	755	four	great
21	R40019	2023-07-1	juice	Main Course	6	552	2	great
22	R40020	2022-03-0	Juice	beverages	7	947	2	repeat
23	R40021	2024-07-2	Steak	Beverages	2	293	2	great
24	R40022	2022-07-0	juice	beverages	2	1441	five	
25	R40023	Jun 22, 20	burger	Beverages	1	929	four	cold food
26	R40024	2024-04-2	pasta	Beverages	9	885	3	cold food
27	R40025	06/09/202	Burger	Beverages	4	1165	1	bad service

2.1. Formatting

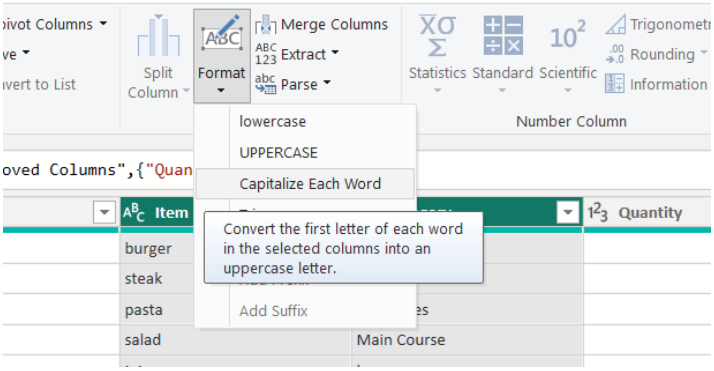
- **Converted textual numbers to numeric values**
  Some numerical values were written in words, so they were renamed and converted to actual numbers.



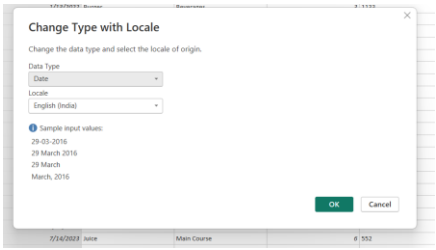
- **Converted numbers stored as text to proper numeric format**
  Certain numeric fields were incorrectly stored as text; these were transformed into numerical data types.



- **Applied consistent capitalization**
  Each word was capitalized in Power Query Editor to ensure uniform text formatting.



- **Standardized date formats**
  Dates were converted into a consistent format using the **Use Locale** option in Power Query Editor.



2.2. Handling Missing Values

- **Rating**
  Missing values in the *Rating* column were imputed using the median value.
  Formula used:
  =MEDIAN(G2:G211)

- **Feedback**
  Missing values in the *Feedback* column were filled using the most frequently occurring (mode) value.
  Formula used:
  =INDEX(H2:H211, MATCH(MAX(COUNTIF(H2:H211, H2:H211)), COUNTIF(H2:H211, H2:H211), 0))

	A	B	C	D	E	F	G	H	I	J
1	**OrderID**	**OrderDate**	**Item**	**Category**	**Quantity**	**Price**	**Rating**	**Feedback**		
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3	R40001	28/06/202	steak	Fast Food	1	1886	5	cold food		
4	R40002	Jan 15, 20	pasta	beverages	1	980	4	great	Rating (median)	4
5	R40003	Jul 21, 202	salad	Main Course	2	726	4	great	Feedback (freq occuring)	repeat
6	R40004	19/06/202	juice	beverages	8	1187	2	cold food		
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13	R40011	2024-09-1	pasta	beverages	3	1421	4	repeat		

- **Pricing**
  Only two null values were found in the *Price* column, so the values were filled using the **Fill Down** method.

3 Visualization & Analysis

3.1. KPI Cards (Total Revenue, Total Quantity, Avg Revenue per Item, Average Ratings)

- **Visualization Type:** KPI Cards
- **Interpretation:** These cards display quick, at-a-glance business metrics — total revenue ($213.54K), total quantity sold (1,111), average revenue per item ($35.59K), and overall average rating (3.52).
- **Reason for Use:** KPI cards are ideal for summarizing performance indicators and providing a snapshot of overall business health in a single glance.

3.2. Line Graph (Sales by Day)

- **Visualization Type:** Line Chart
- **Interpretation:** The graph shows how total daily sales fluctuate throughout the period. There are noticeable peaks and troughs, indicating inconsistent daily performance.

- **Reason for Use:** A line chart effectively displays trends over time, helping identify demand patterns, volatility, and possible operational inefficiencies.

3.3. Bar Chart (Sales by Category)

- **Visualization Type:** Horizontal Bar Chart
- **Interpretation:** Beverages lead with the highest sales (around $90K), followed by Fast Food and Main Course. This shows which product categories drive the most revenue.
- **Reason for Use:** Bar charts provide a clear visual comparison of categorical data, making it easy to compare revenue across different product types.

3.4. Pie Chart (Quantity by Category)

- **Visualization Type:** Pie Chart
- **Interpretation:** Fast Food accounts for 41.22% of total quantity sold, Beverages 38.43%, and Main Course 20.34%. This highlights the proportion of items sold per category.
- **Reason for Use:** A pie chart is suitable for illustrating the relative share of each category within the total, making proportions visually intuitive.

3.5. Table (Top 5 Items)

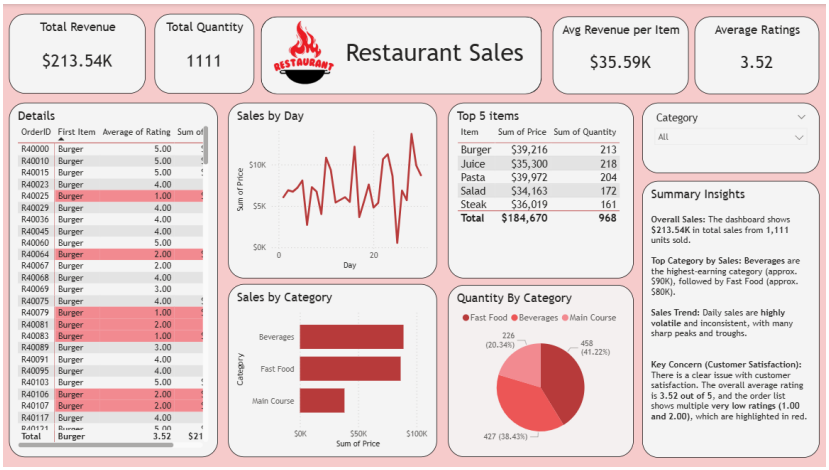
- **Visualization Type:** Tabular View
- **Interpretation:** The top five items — Burger, Juice, Pasta, Salad, and Steak — contribute $184,670 in sales, with Burger being the top seller.
- **Reason for Use:** Tables are best for presenting detailed item-level data and exact figures for sales and quantities, which complement the visual summaries.

3.6. Table with Conditional Formatting (Details Section)

- **Visualization Type:** Data Table with Color Scale
- **Interpretation:** Displays order-level details, including ratings and prices. Low ratings (1.0 or 2.0) are highlighted in red, signaling poor customer feedback.
- **Reason for Use:** Conditional formatting quickly draws attention to performance issues and helps identify problem areas in service or product quality.

3.7. Text Box (Summary Insights)

- **Visualization Type:** Text/Annotation Box
- **Interpretation:** Provides narrative insights summarizing the dashboard findings — sales performance, trends, and key concerns like customer satisfaction.
- **Reason for Use:** A text box helps communicate analysis in plain language, connecting data visuals to actionable business meaning.



4. Insights & Findings

4.1. Beverages have high revenue

Beverages have the highest revenue (~$90K), showing strong demand.
The restaurant can add more drink options or combo deals to boost profits.

4.2. Inconsistent Daily sales

Daily sales are inconsistent with many ups and downs.
Offer weekday discounts or promotions to maintain steady sales.

4.3. Average customer rating is low

Average customer rating is low at 3.52/5.
Improve food quality and service to increase customer satisfaction.

4.4. Focus on quality

Top five items make up 86% of total sales.
Focus on promoting and maintaining quality of these popular dishes.

5. Conclusion & Recommendations

5.1 Conclusion

The Restaurant Sales Dashboard shows that total sales reached **$213.54K** from **1,111 items sold**. Beverages and Fast Food are the top-performing categories, while Main Courses are less popular. Customer satisfaction is moderate with an average rating of **3.52/5**, showing room for improvement. Daily sales also fluctuate, suggesting inconsistent demand.

5.2 Recommendations

- **Improve Customer Satisfaction:**
  Focus on food quality and service to raise customer ratings. Collect regular feedback to identify and fix issues quickly.
- **Promote Best-Selling Items:**
  Highlight popular items like Burgers and Juices through combos or special offers to increase sales.

- **Boost Low Sales Days:**
  Use weekday promotions or discounts during slow periods to keep sales steady.