INTRODUCTION TO DATA MANAGEMENT PROJECT REPORT

(Project Semester: January – April 2025)

EDA Project on Zomato Restaurants in different countries

Submitted By:
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Programme and Section: CSE, K23GX
Course Code: INT 217

Under the Guidance of
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CERTIFICATE

This is to certify that Arnav Khandelwal, bearing

Registration No. 12308643, has successfully completed the INT 217 project titled, "***EDA Project on Zomato Restaurants in different countries***" under my guidance and supervision.

To the best of my knowledge, the present work is the result of his original development, effort, and study. Signature and Name of the Supervisor Designation:

Lovely Professional University, Phagwara, Punjab

Date: 12-04-2025

DECLARATION

I, Arnav Khandelwal, student of *Introduction to Data Management* under the CSE/IT Discipline at Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine to the best of my knowledge. Date: 12/04/2025 Signature:

Arnav Khandelwal
Registration No.: 12308643

1. Introduction

In this project, I have developed a comprehensive data analysis dashboard that explores restaurant trends and customer behavior based on publicly available data from Zomato's restaurant listings. The primary goal is to visualize and uncover meaningful insights from the dining landscape in major localities, with a focus on understanding pricing, customer preferences, and service patterns in the food and beverage sector.

The dashboard and analysis enable stakeholders—such as restaurant owners, hospitality consultants, food delivery platforms, and business analysts—to explore:

- **Overall restaurant density and distribution by locality**
- **Patterns in pricing and cost for two across different areas**
- **Relationship between customer ratings and meal prices**
- **Impact of online delivery and table booking services**
- **Cuisine preferences and premium dining clusters**

This data-driven approach empowers businesses and decision-makers to better understand consumer trends, optimize restaurant services, and strategically position offerings in highly competitive markets.

2. Source of Dataset

- **Dataset Title: Zomato Restaurants Data Analysis**
- **Time Period Covered: 2018 to 2021**
- **Source: Kaggle.com – Open Data Platform for Data Science Projects**
- **File Name: zomato_reataurants_analysis_in_Excel.xlsx**
- **Total Records: Approximately 51,934**
- **Primary Attributes Include:**
  - **Restaurant Name**
  - **Locality and City**
  - **Project Completion Date**
  - **Price Range Category**

3. Dataset Preprocessing

Before creating the dashboard and visualizations, the Zomato dataset underwent several essential preprocessing steps to ensure data accuracy and meaningful insights:

- **Date Conversion:**
  The *"Datekey_Opening"* column was reformatted into a proper datetime format, extracting the year component for year-wise trend analysis.
- **Handling Missing Values:**
  Fields like *"Rating"*, *"Votes"*, and *"Cuisines"* contained missing or null values. These records were either excluded from specific visualizations or grouped under an "Unknown" or "Not Available" category to maintain clarity and consistency in charts.
- **Data Cleaning Techniques Used:**
  - **Trimmed extra white spaces and corrected inconsistent text casing across string columns like *Locality*, *Cuisines*, and *City*.**
  - **Removed duplicate restaurant records based on name, locality, and cost attributes to avoid redundant entries.**

- **Converted string-formatted numeric columns (e.g., Project Cost, Savings) into numerical data types.**

This cleaning ensured reliable analytics and accurate graphical representations.

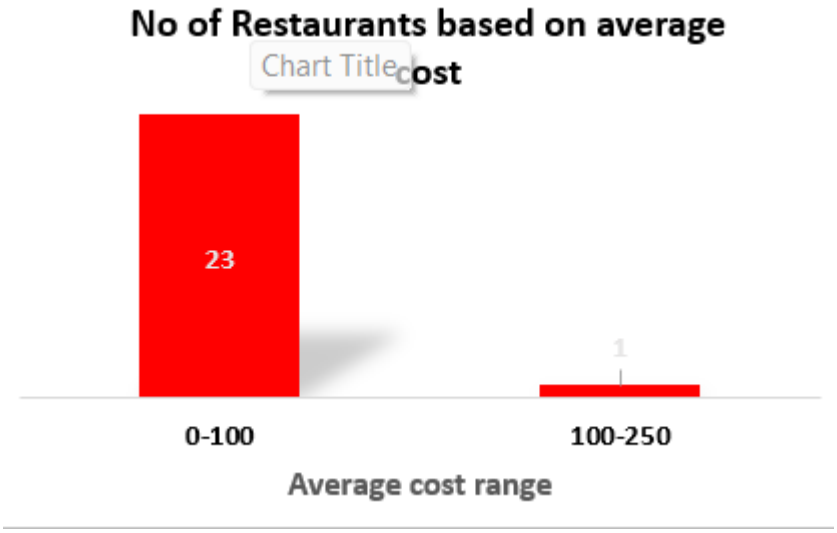
4. Data Analysis & Dashboard Insights

The dashboard was created using Microsoft Excel, incorporating pivot tables, slicers, and dynamic charts to support interactive exploration of the dataset.
Key Overview Metrics:

Metric	Value
Total Number of Restaurants	9,235
Restaurants	
Number of Restaurants Accepting Table	
Bookings	2,112
Average Cost for Two (Overall Mean)	₹746
Most Popular Cuisine	North Indian

4.1. Average Cost Distribution of Restaurants

- **Visualization: Bar chart of the number of restaurants by *Average Cost for Two* price range.**
- **Insight: The highest number of restaurants fall within the ₹0–₹100 price range, indicating a strong presence of budget-friendly, affordable dining options. In contrast, only a small number of restaurants are positioned within the ₹100–₹250 price range, highlighting a relatively lower presence of mid-range establishments in the dataset.**

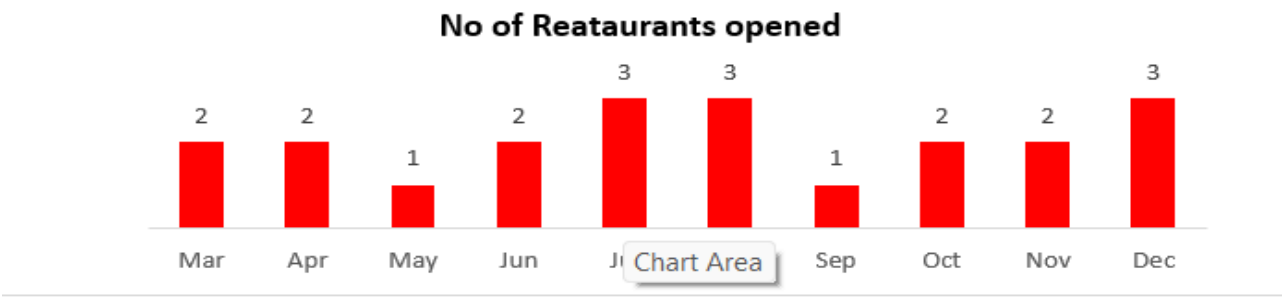


4.2. Distribution of Restaurants by Average Ratings

- **Visualization: Bar chart showing the number of restaurants within different average rating ranges.**
- **Top Rating Ranges:**
  - **3.5–4.0**: 10 restaurants
  - **3.0–3.5**: 5 restaurants
  - **4.0–4.5:** 5 restaurants
- **Insight: Most restaurants in the dataset have ratings between 3.5 and 4.0, indicating a generally positive customer experience across the majority of establishments. Only a small number of restaurants fall below a 3.0 rating or exceed 4.5, suggesting moderate variability in service quality and customer satisfaction**

4.3. Restaurant Openings by Month

- **Visualization: Bar chart showing the number of restaurants opened each month.**
- **Findings:**
  - **June, July, and December recorded the highest number of new restaurant openings (3 each).**
  - **May and September saw the lowest activity, with just 1 new opening in each month.**



4.4. Total Project Cost by County

- **Visualization: Line chart comparing cumulative project costs across counties.**
- **Top Counties by Investment:**
  - **Kings**
  - **New York**
  - **Erie**
  - **Suffolk**
  - **Monroe**
- **Insight: Popular cuisines such as Modern, Café, and Pizza received the bulk of restaurant offerings—likely due to higher customer demand and a preference for trendy dining experiences in different countries.**

4.5. Dashboard Interactivity (Slicers)

The dashboard includes interactive filters and slicers that allow users to dynamically filter and analyze data based on:

- **Locality: View restaurant trends and comparisons within specific areas or neighborhoods.**
- **Online Delivery Availability: Analyze restaurants that offer delivery services versus those that don't.**
- **Table Booking Availability: Filter for dine-in places accepting advance reservations.**
- **Cuisines Offered: Explore the performance and distribution of different cuisine categories like North Indian, Chinese, Continental, etc**
- **Average Cost for Two (Price Range): Segment restaurants by affordability levels to compare pricing and customer ratings.**

This functionality enhances the user experience, allowing customized views for deeper analysis.

Row Labels	Count of Cuisines
Asian, Indonesian, Western	1
Burger	1
Cafe, Coffee and Tea, Western	1
Cafe, Desserts, Beverages	1
Cafe, Italian, Coffee and Tea, Western, Indonesian	1
Cafe, Western	1
Desserts, Bakery, Western	1
French, Western	1
Indonesian	1
Italian, Continental	1
Japanese	1
Japanese, Sushi, Ramen	1
Korean	1
Peranakan, Indonesian	1
Seafood, Western	2
Sunda, Indonesian	3
Sushi, Japanese	1
Western, Asian, Cafe	1
Grand Total	21

Row Labels	Distinct Count of Cuisines
Asian, Indonesian, Western	1
Burger	1
Cafe, Coffee and Tea, Western	1
Cafe, Desserts, Beverages	1
Cafe, Italian, Coffee and Tea, Western, Indonesian	1
Cafe, Western	1
Desserts, Bakery, Western	1
French, Western	1
Indonesian	1
Italian, Continental	1
Japanese	1
Japanese, Sushi, Ramen	1
Korean	1
Peranakan, Indonesian	1
Seafood, Western	1
Sunda, Indonesian	1
Sushi, Japanese	1
Western, Asian, Cafe	1
Grand Total	18

Row Labels	Count of Has_Table_booking
No	21
Grand Total	21

Row Labels	Count of Has_Online_delivery
No	21
Grand Total	21

Row Labels	measure 1
2010	1
2011	5
2013	1
2014	4
2015	3
2016	1
2017	1
2018	5
Grand Total	21

Row Labels	measure 1
Mar	2
Apr	2
May	1
Jun	2
Jul	3
Aug	3
Sep	1
Oct	2
Nov	2
Dec	3
Grand Total	21

5. Conclusion

The dashboard provides a comprehensive overview of dining trends, customer behavior, and service patterns in the restaurant industry based on Zomato's restaurant listings data. Key takeaways include:

- **A significant concentration of restaurants in a few highly competitive localities, indicating popular dining hubs.**
- **North Indian and Chinese cuisines emerged as the most commonly offered food categories across cities.**
- **A large number of restaurants now offer online delivery services, reflecting shifting customer preferences towards convenience.**
- **The interactive dashboard serves as a valuable tool for restaurant owners, analysts, and delivery platforms to monitor market trends, identify opportunities, and optimize business strategies in the competitive food service industry.**

6. Future Scope

To further enrich the dashboard and expand its utility, the following enhancements are proposed:

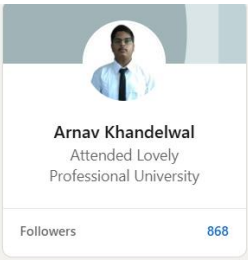
- **Integration with Real-Time Customer Reviews and Ratings:**
  Incorporating live updates from Zomato or other platforms to reflect changing customer sentiments and trending restaurants.
- **Predictive Modeling:**
  Implement machine learning models to predict the likelihood of a restaurant's success based on factors like location, cuisine, price range, and service features.
- **Geo-Spatial Mapping:**
  Use interactive maps to visually identify restaurant clusters, high-demand localities, and underserved areas within cities to support business expansion strategies.
- **Customer Segmentation Analysis:**

Categorize restaurants based on target audience preferences, such as family dining, fine dining, quick service, and delivery-focused outlets, to better understand market gaps and customer behavior trends.

7. References

- **Zomato Restaurants Dataset – Kaggle Open Data Platform**
- **Microsoft Excel Documentation and Dashboard Tutorials – ExcelJet.net**
- **Python Data Cleaning and Visualization Tutorials – Real Python**

8. Linkdin:-



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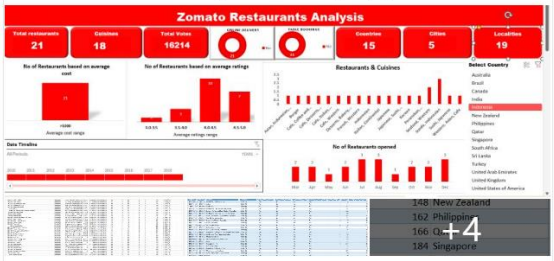

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