**RESTAURANT RATING DATA ANALYSIS BY EMMANUEL AJIMATI**

**PROJECT OVERVIEW:**

The project aims to analyze consumer preferences, restaurant ratings, and market demand-supply gaps to identify the best restaurant investment opportunities based on data-driven insights.

**Dataset Description**

The dataset comprises four related tables:

1. **Consumer Preferences**

* This dataset captures **what cuisines consumers prefer.** Each entry represents a consumer and their **favourite type of cuisine,** such as **Mexican, Italian, Chinese, or Coffee Shops.**

1. **Consumers**

* This dataset provides **insights into consumer behaviour** by detailing their **age, location, occupation, spending habits, and lifestyle choices**. It helps identify **target audiences** for restaurant investments.  
  It includes:
* **Age & Occupation**: - Determines whether consumers are students, professionals, or retirees.
* **Budget**: - Categorizes spending power (Low, Medium, or High).
* **Lifestyle Factors**: - Indicates whether a consumer **smokes, drinks alcohol, or has children.**
* **Transportation Method**: - Helps understand how customers travel to restaurants (public transport, car, walking).

1. Restaurant Ratings
   * This dataset stores customer ratings for restaurants, including:
   * Overall Rating: - How satisfied customers are.
   * Food Rating: - Evaluates food quality.
   * Service Rating: - Measures restaurant service experience.

This helps determine which cuisines perform well and whether ratings align with consumer preferences.

1. Restaurant Cuisines
   * This dataset links each restaurant to its cuisine type, showing what kind of food, they offer. By comparing it with consumer preferences, we can determine whether supply meets demand or if there are market gaps.
2. Restaurants

This dataset contains **business-related information** for restaurants, including:

* Location (City, State, Country, ZIP Code, Coordinates) → Useful for geographic analysis.
* Price Category (Low, Medium, High) → Helps identify whether pricing affects ratings.
* Alcohol & Smoking Policies → Important for targeting different customer segments.
* Parking & Franchise Information → Determines if a restaurant is independent or part of a larger chain.

**INTRODUCTION:**

The food industry is constantly evolving, shaped by consumer preferences, dining habits, and market trends. Understanding what customers want and what restaurants offer is crucial for making data-driven business decisions.

This project aims to analyze consumer preferences, restaurant ratings, and supply-demand gaps to uncover the best investment opportunities in the restaurant industry.

**PROBLEM STATEMENT:**

The restaurant industry is highly competitive, and consumer preferences are constantly changing. Investors and restaurant owners need data-driven insights to make informed decisions about which cuisines to offer, where to open restaurants, and how to optimize pricing and service quality. This project addresses the following key issues:

However, there are several challenges:

1. **Mismatch Between Consumer Demand & Restaurant Supply**

* Are restaurants offering the cuisines that people actually want?
* Are there high-demand cuisines with very few restaurants available (*market gaps*)?

1. **Understanding What Makes a Restaurant Successful**

* Do top-rated restaurants serve the most popular cuisines?
* What factors influence customer ratings (food quality, service, price, location)?

1. **Finding the Best Business Strategy for New Restaurants**

* Which cuisines, locations, and price ranges will attract the most customers?
* How do consumer demographics (age, budget, lifestyle) affect dining choices?

**CHALLENGES FACED AND HOW THEY WERE RESOLVED:**

During the analysis of consumer preferences, restaurant ratings, and market demand, several challenges arose. Here’s how each issue was tackled:

1. **Data Gaps & Missing Information**

**Problem:**

* Some datasets contained missing values, especially in consumer demographics and restaurant details.
* Certain cuisines had zero restaurant supply, making it hard to compare demand vs. supply.

**Solution:**

* Used data cleaning techniques (e.g., filling missing values, removing incomplete records).
* For completely missing data points, used average values or similar category approximations.
* Focused on cuisines with sufficient data, while marking missing ones as potential market opportunities.

1. **Inconsistent Rating Scales & Bias in Reviews**

**Problem:**

* Some restaurants had very low ratings, even for the "highest-rated" ones.
* Consumers might be more likely to leave negative reviews than positive ones.

**Solution:**

* Checked correlations between ratings and consumer preferences to find actual demand trends.
* Analyzed review distribution to ensure fair representation of different cuisines.

1. **Consumer Bias & Demographic Imbalance**

**Problem:**

Majority of consumers were young (21-25), single, and students, leading to skewed preferences.

Data was collected only from Mexico, limiting global insights.

**Solution:**

* Identified high-demand cuisines specific to the target demographic (e.g., fast food, coffee shops).
* Recommended targeted business strategies for the dominant customer segment (e.g., affordable pricing for students).
* Suggested future data collection from other regions to expand insights beyond one location.

**EXPLORATORY DATA ANALYSIS (EDA):**

EDA helps uncover patterns, trends, and relationships in the data before making business decisions. Below is a breakdown of key insights from the datasets. Key Insights from Descriptive Statistics.

1. **Understanding Consumer Preferences**

**Objective:** Identify the most preferred cuisines among consumers.

**Steps:**

* Count the number of consumers who prefer each cuisine.
* Visualize top cuisines with a bar chart.

Expected Insights:

* Identify high-demand cuisines.
* Spot niche cuisines with growth potential.

1. **Analyzing Restaurant Ratings**

**Objective:** Determine **which cuisines receive the highest customer satisfaction**.

**Steps:**

* Calculate **average ratings** per restaurant.
* Merge ratings with **restaurant cuisines**.
* Identify **the highest-rated cuisines** based on **overall, food, and service ratings**.

**Expected Insights:**

* Do **top-rated cuisines** match **consumer preferences**?
* Find cuisines with **great ratings but low availability** (business opportunity!).

1. **Demand vs. Supply Gap Analysis**

**Objective:** Compare **how many people prefer a cuisine vs. how many restaurants serve it**.

**Steps:**

* Compare consumer preference count vs. restaurant count per cuisine.
* Highlight cuisines with high demand but low supply (*market gaps!*).
* Sort cuisines based on demand-supply imbalance.

**Expected Insights:**

* Find underrepresented cuisines with high consumer interest.
* Discover oversaturated cuisines (too many restaurants, low demand).
* Best investment opportunities where demand exceeds supply.

1. **Consumer Demographics & Behavior**

* **Objective:** Understand who the customers are and how their age, income, and lifestyle affect restaurant choices.

**Steps:**

* Analyze age distribution of consumers.
* Group consumers by spending budget (Low, Medium, High).
* Check preferences by age group (Do younger consumers prefer fast food?).

**Expected Insights:**

* Which age group dominates the market?
* Do high-budget consumers prefer certain cuisines?
* Identify target demographics for restaurant investments.

1. **Location-Based Analysis**

**Objective:** Find the best areas to open a restaurant based on customer concentration and demand.

**Steps:**

* Map where consumers are located.
* Find high-foot-traffic areas with demand for restaurants.
* Compare restaurant distribution vs. consumer locations.

**Expected Insights:**

* Which cities have the highest demand?
* Are there locations underserved by restaurants?
* Find hotspots for opening new restaurants.

**Recommendations:**

1. Invest in High-Demand, Low-Supply Cuisines
   * Coffee Shops, Latin American, Hot Dogs, and Afghan cuisine have high demand but few restaurants—great investment opportunities.
   * Start with food trucks, pop-ups, or cloud kitchens before full-scale restaurants.
2. Target Young, Budget-Conscious Consumers
   * Most customers are 21-25, students, and single, preferring affordable, fast-casual dining.
   * Focus on universities, nightlife areas, and business districts.
3. Improve Service & Pricing to Boost Ratings
   * Train staff for better service, ensure consistent food quality, and offer loyalty programs to retain customers.
4. Expand to Underserved Locations
   * Use heatmaps to find high-foot-traffic areas with few restaurants.
   * Consider delivery-only ghost kitchens in areas with high online food demand.
5. Use Data & Trends for Growth
   * Monitor customer preferences & sales data with Power BI dashboards.
   * Adapt the menu seasonally and follow emerging food trends.

**Key Findings Summary**

* Mexican & Coffee Shops are high-demand cuisines, but supply is limited.
* Young consumers (21-25) with medium budgets dominate the market.
* Opportunities exist for Latin American, Hot Dogs, and Afghan cuisine due to low competition.
* Restaurant success is driven by quality service, consistency, and strategic pricing.

**Tools and Visualizations**

* **Power BI**: - Interactive dashboards for tracking restaurant trends, demand-supply gaps, and location analysis.
* **Excel**: - Structured data organization, summary tables, and report generation.

**Key Visualizations & Insights**

1. Bar Charts: -Top-Rated Restaurant Cuisines vs. Consumer Preferences (to compare demand vs. supply).
2. Heatmaps: - Location-Based Demand & Restaurant Density (to identify underserved areas).
3. Scatter Plots: - Ratings vs. Pricing Strategy (to analyze customer satisfaction trends).
4. Pie Charts: - Consumer Demographics Breakdown (to understand spending habits & preferences).
5. Trend Lines: - Emerging Food Trends & Preferences Over Time (to track changes in demand).