**Data Analysis Report**

**Analyzing User Behavior, Cooking Preferences, and Order Trends**

## ****1. Introduction****

### ****Objective:****

The primary goal of this project is to analyze three datasets related to user behavior, cooking preferences, and order trends. Here, users engage in cooking sessions and place orders. By analyzing these datasets, we aim to:

* Understand the relationships between cooking sessions and user orders.
* Identify popular dishes and meal types.
* Explore how demographic factors (such as age and location) influence user behavior and order patterns.
* Provide actionable business insights to enhance user engagement and improve sales strategies.

### ****Datasets****

We used the following datasets:

* **UserDetails**: Contains demographic information about users with columns: User id, user name, age, location, registration date, phone, email, favorite meal, total orders.
* **CookingSessions**: Records of each cooking session with session id, user id, dish name, meal type, session start, session end, duration, session rating **OrderDetails**: Information about orders placed by users including order id, user id, order date, meal type, dish name, order status, amount (USD), time of day, rating, session id

## ****2. Data Cleaning and Preparation****

### ****Data Import****

The data from the three datasets (UserDetails, CookingSessions, and OrderDetails) was loaded into Python using the pandas library.

### ****Missing Data****

Upon initial examination of the datasets, there were some missing values in Rating column of OrderDetails found. So I handled the missing numerical values in Rating by replacing with 0. There were no missing values in other 2 datasets.

### ****Duplicates check****

I also checked for duplicate rows in all the 3 datasets and there were none found.

### ****Data Merging****

I merged the datasets based on shared identifiers, such as User ID, to create a unified dataset for analysis.

## ****3. Exploratory Data Analysis (EDA)****

### ****Descriptive Statistics****

To get an overview of the data, we computed basic descriptive statistics such as mean, median, and standard deviation for numerical variables like age, total orders, and amount (USD).

### ****Data Visualizations****

We used visualizations to explore various relationships in the data, such as the relationship between user demographics and order trends, session duration and meal preferences.

#### ****1. Total Orders Distribution by Age****

A bar plot was created to explore the relationship between a user’s age and their total number of orders placed.

* **Insight**: The plot shows that users of age 42 and 38 have placed more orders. They might be more engaged with the platform, possibly due to lifestyle and convenience.

#### ****2. Most Popular Dishes ordered****

We analyzed which dishes are the most popular by maximum number of orders placed using a bar plot.

* **Insight**: The most popular dishes are Grilled Chicken and Spaghetti. This can give a clear picture of what dishes are the most popular and can influence menu planning.

#### ****3. Session Duration vs total orders****

We created a scatter plot to visualize if there’s a relationship between the user’s duration of cooking sessions and the number of orders that they place.

**Insight**: Users In Sessions of 30 mins and 40 mins have placed more orders. However there is no such pattern visible here. Improving session experiences might lead to more frequent user engagement.

* We have also plotted which user has placed how many orders. Charlie Lee has placed maximum number of 15 orders.

#### Meal Type Distribution by Age

We analyzed which meal type (Dinner, Breakfast, Lunch) has been preferred according to the age of users using a countplot.

* **Insight**: Almost all of the users have ordered Dinner. You can see which meal types are more popular in each age group, which can help customize meal offerings for different age demographics.

#### ****5. Dish Preferences by Age****

We analyzed which dishes are the most preferred by the age group of people using a count plot.

* **Insight**: Preferences are varying however Veggie Burger and Oatmeal are ordered lesser compared to the the remaining items.

#### ****6. Total Orders according to the time****

Analyzed during what time of the day, most orders have been placed using a bar plot.

* **Insight**: Morning - Breakfast has maximum number of orders placed

#### ****7. Total Orders by Location****

We used a bar plot to show how the distribution of total orders varies across different user locations.

* **Insight**: Certain locations have a significantly higher number of orders, like Chicago and Boston, suggesting regional preferences or market opportunities in specific areas.

### ****8. Order Amount vs. Time of Day****

Exploring whether people tend to spend more money at certain times of day (morning, day, night) using a boxplot.

* **Insights**: This could reveal trends in spending based on the time of day, helping businesses understand when users tend to make larger purchases. Here, users spent more on Dinners

## ****4. Business Insights and Recommendations****

### ****Insights****

* **Age and Order Frequency**: Older users, particularly 30+ place more orders on average. These users may prefer convenience and time-saving meal options.
* **Location-Based Trends**: Certain regions have more active users, indicating potential areas for targeted marketing campaigns and regional promotions.
* **Session Duration**: While session length does not strongly correlate with more orders, there could be value in optimizing session experiences to encourage longer, more engaging sessions.
* **Meal Type Preferences :** Dinner tend to be the most popular, suggesting that businesses should consider running time-limited offers or discounts during this period to maximize revenue.
* **Order Timing**: Examining order amounts by time of day revealed that customers tend to spend more during the evening, suggesting that the platform could offer evening promotions to boost sales.

### ****Recommendations****

1. **Targeted Marketing**
2. **Optimize Cooking Sessions**
3. **Menu Customization**
4. **Evening(Dinner) Promotions**
5. **Sales Optimization**

## ****5. Conclusion****

* The analysis of the datasets revealed several interesting trends that can be used to optimize the platform’s offerings and marketing strategies. By focusing on the identified user segments, meal preferences, and session characteristics, the platform can enhance user engagement and drive higher order volumes.