PIZZA SELLING PROJECT

Project Summary

The data analysis project aims at optimizing pizza sales to maximize profits in the upcoming year.

The analysis has been conducted using SQL in MySQL Workbench. The approach can be summarized into the following key objectives:

- Analyze the current performance of pizza sales by identifying the best and worst-selling pizzas.
- Determine the best and worst periods in terms of order volume.
- Formulate recommendations and suggestions based on the findings.

Data Sources:

An open-source Kaggle dataset is utilized for the project consisting of four CSV files:

- orders.csv containing columns: order_id, date, and time.
- order_details.csv containing columns: order_details_id, order_id, pizza_id, and quantity.
- pizza_types.csv containing columns: pizza_type_id, name, category, and ingredients.
- pizzas.csv containing columns: pizza_id, pizza_type_id, size, and price.

The combination of the four tables has a consolidated dataset of 48,260 unique rows and 11 unique columns.

Data Processing:

The analysis began with the following steps:

1. Data Retrieval: The Kaggle dataset is imported by using SQL in MySQL Workbench (Fig.1).

```
LOAD DATA LOCAL INFILE 'D:/projects/SQL_pizza_project/data/order.csv'
INTO TABLE orders
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\n'
IGNORE 1 ROWS;
```

Fig.1. Example of importing Kaggle dataset

2. Data Cleaning: Data cleaning performance to address issues such as null values, and duplicate rows, and ensure correct data types.

```
DELETE FROM orders
WHERE orders.date IS NULL
```

Fig. 2. Code part of deleting null values in dataset ‘orders’

Data Analysis:

Brief descriptive analysis: The pizzeria's menu boasts an extensive selection of 32 distinct pizza varieties, providing customers with a wide array of choices. In the year 2015, the store successfully fulfilled 21,350 orders, resulting in the sale of an impressive 49,574 pizzas showing the highest result. On average, there were 2 pizzas ordered per transaction.

The main findings of our analysis can be summarized as follows:

1) Best and Worst-Selling Pizzas: Identify the pizzas with the highest and lowest sales, providing insights into top-performing products. Building the distribution of the number of pizzas ordered by pizza size helps to understand which pizza in terms of size is the most popular (Fig. 3).

```sql
SELECT
    CASE
        WHEN SUBSTR(pizza_id, -1) = 's' THEN 'Small'
        WHEN SUBSTR(pizza_id, -1) = 'm' THEN 'Medium'
        WHEN SUBSTR(pizza_id, -1) = 'l' THEN 'Large'
        ELSE 'Unknown'
    END AS Pizza_Size,
    sum(quantity) AS Total_Quantity
FROM order_details
GROUP BY Pizza_Size
ORDER BY Total_Quantity DESC;
```

Fig. 3. Code part of finding the distribution of the quantity of pizzas ordered by pizza size.

As a result, the large one is sold 19536, medium – 15635, and small – 14403. Moreover, the "big_meat_s" pizza was the most ordered, with a total quantity of 1,914.

2) Best and Worst Selling Time: Determination of the months with the highest and lowest order volumes, showing seasonal trends (Fig. 4).

```sql
SELECT DATE_FORMAT(date, '%Y-%m') AS Month,
       COUNT(DISTINCT order_id) AS Total_Orders
FROM orders
GROUP BY Month
ORDER BY Total_Orders desc;
```

Fig. 4. Code part to identify the month of the highest selling volume

The highest order volume was observed in July with 1,935 orders and the lowest in October with 1,646 orders.

Doing the same with weekdays, it's found out that Friday is the day with the most orders with 3,538 orders in total (Fig. 5).

```sql
SELECT DATE_FORMAT(date,'%w') AS Day_of_Week, COUNT(order_id) AS Total_Orders
FROM orders
GROUP BY Day_of_Week
ORDER BY Total_Orders DESC
LIMIT 1;
```

Fig. 5. Code part to identify the month of the highest selling volume

Recommendations:

Based on the analysis, the following actions can be taken to improve profitability:

- Product Optimization: Maximize the popularity of best-selling pizzas, like "big_meat_s." Use promotions and size discounts to encourage exploration of different flavors.
- Seasonal Strategies: Target peak days like Fridays with specific promotions. Plan marketing campaigns to boost sales during slower months, e.g., October.
- Customer Preferences: Tailor your menu based on customer feedback and preferences, introducing items aligned with their tastes.
- Pricing Strategy: Optimize pricing to attract and retain customers while considering cost factors and size-specific demand.
- Operational Efficiency: Streamline operations to handle higher order volumes during peak months effectively, including staffing and resource allocation.
- Upselling and Combos: Encourage customers to order more items or complementary products like sides and drinks. Implement bundle deals and suggest add-ons during the ordering process to increase order value.