**Data Analysis Report**

**Title: Pizza Business Analysis for Operational Insights**

**Prepared By: Priyanka Mohapatra**

**Objective**

**The primary goal of this analysis is to derive actionable insights for a pizza business based on historical sales data. The analysis focuses on the following questions:**

1. **How many customers do we have each day? Are there any peak hours?**
2. **How many pizzas are typically in an order? Do we have any bestsellers?**
3. **How much money did we make this year? Can we identify any seasonality in the sales?**
4. **Are there any pizzas we should take off the menu, or any promotions we could leverage?**

**Dataset Overview**

**The analysis utilized the following datasets:**

1. **Data Dictionary: Metadata describing the fields in other datasets.**
2. **Orders: Details of individual customer orders.**
3. **Pizza Types: Descriptions of available pizza varieties.**
4. **Pizzas: Detailed inventory of pizza items.**
5. **Order Details: Itemized breakdown of each order.**

**Libraries Used**

* **Pandas: Data manipulation and analysis.**
* **NumPy: Numerical computation.**
* **Matplotlib & Seaborn: Data visualization.**

**Methodology**

**1. Data Loading and Cleaning**

* **Imported datasets into Python using pandas.**
* **Previewed and cleaned datasets to handle missing or inconsistent data.**
* **Verified data types for compatibility with analysis requirements.**

**2. Analysis**

**Customer Trends**

* **Evaluated daily customer counts.**
* **Identified peak hours using time-based groupings.**

**Order Insights**

* **Analysed order sizes to determine average pizzas per order.**
* **Ranked pizzas by sales volume to identify bestsellers.**

**Revenue Analysis**

* **Summarized yearly revenue from sales records.**
* **Used line plots to uncover seasonality trends in sales.**

**Menu Optimization**

* **Identified pizzas with consistently low sales.**
* **Suggested promotional strategies for top-performing items.**

**Customer Purchase Behaviour**

* **Segmented customers based on purchasing frequency and value.**

1. **How many customers do we have each day? Are there any peak hours?**

* **Daily Customers:**
  + **The number of customers each day varies, with the example showing:**
    - **January 1, 2015: 69 customers**
    - **January 2, 2015: 67 customers, and so on.**
* **Peak Hours:**
  + **Peak business hours were identified as:**
    - **12 PM (2,520 orders), 1 PM (2,455 orders), 5 PM (2,336 orders), 6 PM (2,399 orders), and 7 PM (2,009 orders).**

1. **How many pizzas are typically in an order? Do we have any bestsellers?**

* **Pizzas Per Order:**
  + **On average, each order contains 2.32 pizzas.**
* **Best-Selling Pizzas:**
  + **The top 5 bestsellers are:**
    1. **Big Meat (Small): 1,914 pizzas.**
    2. **Thai Chicken (Large): 1,410 pizzas.**
    3. **Five Cheese (Large): 1,409 pizzas.**
    4. **Four Cheese (Large): 1,316 pizzas.**
    5. **Classic Deluxe (Medium): 1,181 pizzas.**

1. **How much money did we make this year? Can we identify any seasonality in the sales?**

* **Total Revenue: $817,860.05 for the year.**
* **Monthly Revenue Insights:**
  + **The highest revenue months were:**
    - **July: $72,557.90**
    - **May: $71,402.75**
  + **Sales declined in September and October, indicating possible seasonality or external factors.**

1. **Are there any pizzas we should take off the menu, or any promotions we could leverage?**

* **Pizzas to Remove: No pizzas had extremely low sales to suggest removal.**
* **Promotions:**
  + **The best candidates for promotions are the top-sellers:**
    - **Big Meat (Small)**
    - **Thai Chicken (Large)**
    - **Five Cheese (Large)**
    - **Four Cheese (Large)**