❖ **Problem Statement:**

Optimizing Pizza Restaurant Operations through Data Analysis

Background

A pizza restaurant has been collecting transactional data for the past year. This data presents a valuable opportunity to gain deeper insights into customer behavior, operational efficiency, and revenue performance.

Business Objective

The primary goal of this project is to leverage data analytics to optimize restaurant operations, increase sales, and enhance customer satisfaction.

Specific Business Questions

To achieve this objective, we will address the following key questions:

1. **Peak Period Identification:**
    - What are the busiest days of the week and times of the day for the restaurant?
    - How does demand vary across different seasons and holidays?
2. **Pizza Demand Analysis:**
    - Which pizza types and sizes are the most popular?
    - Are there any seasonal trends or preferences in pizza orders?
3. **Revenue Performance:**
    - What is the average daily, weekly, and monthly revenue?
    - How does revenue fluctuate over time?
    - What factors influence revenue, such as promotions, special events, or weather conditions?
4. **Operational Efficiency:**
    - How many pizzas are produced during peak periods?
    - Are there any bottlenecks or inefficiencies in the production process?
    - Can staffing levels be optimized to better meet demand?

Data

The dataset consists of the following relevant features:

- **Order-Level Data:**
    - `order_id`: Unique identifier for each order
    - `order_date`: Date of the order
    - `order_time`: Time of the order
    - `total_price`: Total price of the order
- **Pizza-Level Data:**
    - `order_details_id`: Unique identifier for each pizza item in an order
    - `pizza_id`: Unique identifier for each pizza type
    - `quantity`: Quantity of pizzas ordered
    - `unit_price`: Price per pizza
    - `pizza_size`: Size of the pizza

- `pizza_type`: Type of pizza
- `pizza_ingredients`: Ingredients of the pizza

Expected Outcomes

By analyzing this data, we aim to deliver the following insights and recommendations:

- **Peak Period Optimization:** Identify peak hours and days to optimize staffing and inventory levels.
- **Menu Engineering:** Analyze pizza popularity and profitability to refine the menu and create targeted promotions.
- **Revenue Enhancement:** Identify opportunities to increase average order value and drive sales during slow periods.
- **Operational Efficiency:** Optimize production processes to reduce wait times and improve customer satisfaction.
- **Data-Driven Decision Making:** Establish a data-driven culture to inform future business strategies and initiatives.

By addressing these business questions and leveraging data-driven insights, the restaurant can improve operational efficiency, increase sales, and enhance the overall customer experience.