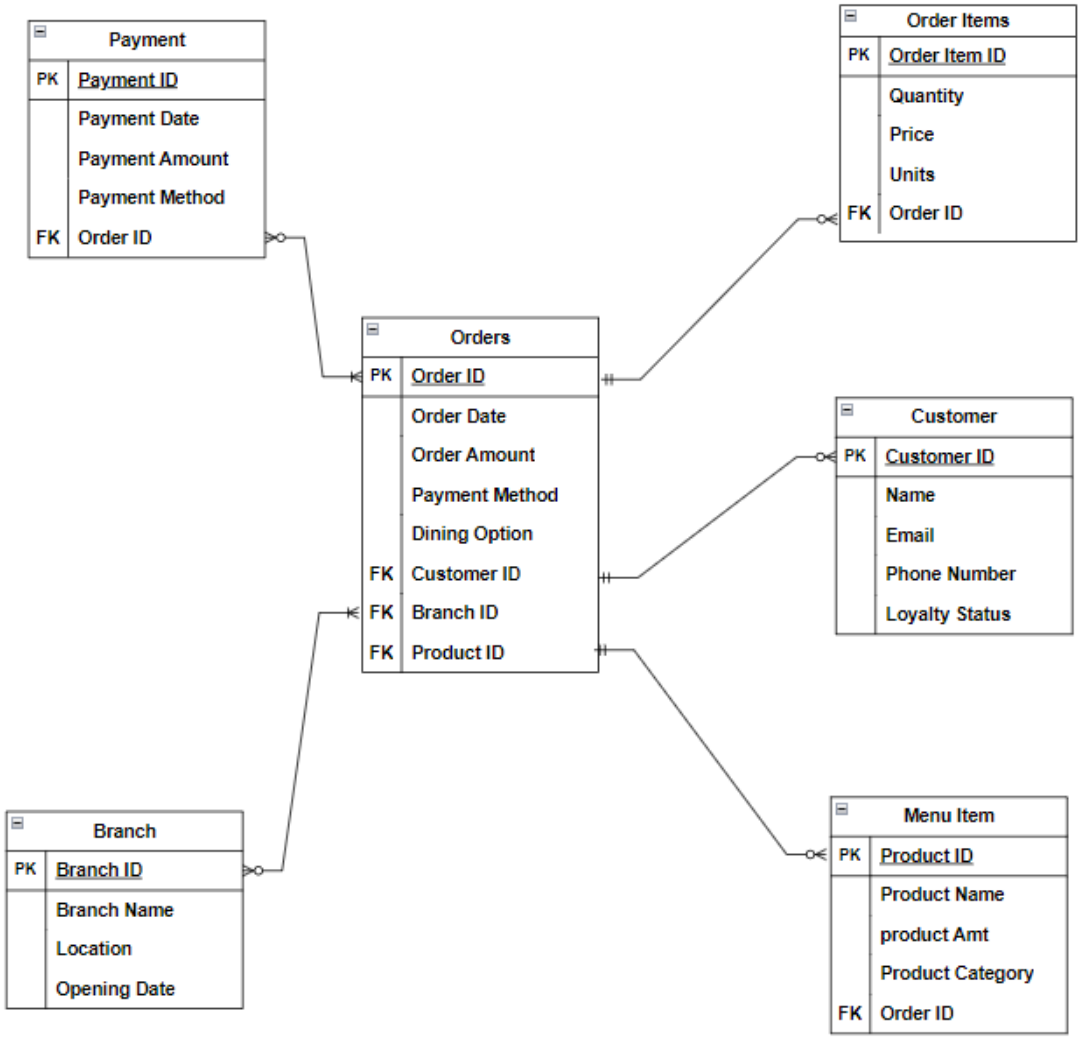
DATA MODELLING ASSIGNMENT

This is a data modelling assignment done by **AKINBUWA OLUWADARE** of the CDE bootcamp.

Question 1:
ERD Diagram showing the entities, attributes and their relationships can be found in the diagram below:



Constraints:

- Stock level must be tracked per branch to account for inventory differences.
- Each order must have a valid payment method.
- Products must belong to a specific branch's menu (since menu items can vary by location).
- Customers can place multiple orders, but one order is linked to only one customer and branch.

Question 2. Dimensional Model

Business Process:

The business process I will be focusing on is **"Sales Transactions."** This will allow Fufu Republic to analyze sales data, understand purchasing trends, track inventory, and provide personalized promotions.

Business Questions:

1. What are the total sales across different branches?
2. What is the breakdown of sales by payment method (cash, card, online)?
3. How do dine-in, take-out, and online orders compare in terms of sales?
4. What are the top-selling products by branch and category?
5. How often do individual customers return, and what are their purchasing patterns?

Fact Table: Sales Fact

The **grain** of the fact table will be at the **individual order item level**, meaning each row in the table represents a specific product sold in an order.

- **Primary Key**: (Order Item ID)
- **Foreign Keys**: Branch ID, Customer ID, Order ID, Product ID, Payment ID, Date ID
- **Measures**:
    - Quantity
    - Unit Price
    - Total Sale Amount (Quantity * Unit Price)
    - Discount Amount
    - Net Sale Amount (Total Sale Amount - Discount Amount)
    - Payment Method (Cash, Card, Online)
    - Dining Option (Dine-in, Take-out, Online)

Dimensions:

1. **Date Dimension** (Date_Dim):
    - **Attributes**: Date ID, Day, Month, Quarter, Year, Weekday/Weekend
2. **Branch Dimension** (Branch_Dim):
    - **Attributes**: Branch ID, Branch Name, Location (City/Area), Opening Date

3. **Customer Dimension** (Customer_Dim):
    - **Attributes**: Customer ID, Name, Email, Phone Number, Loyalty Program Status, Total Orders Placed, Total Spend
4. **Product Dimension** (Product_Dim):
    - **Attributes**: Product ID, Product Name, Category (e.g., Rice, Chicken), Price, Stock Level, Branch-Specific Availability
5. **Payment Dimension** (Payment_Dim):
    - **Attributes**: Payment ID, Payment Method (Cash, Card, Online), Payment Gateway (for online transactions)
6. **Order Dimension** (Order_Dim):
    - **Attributes**: Order ID, Order Date, Total Amount, Branch ID, Customer ID, Dining Option (Dine-in, Take-out, Online)

Final Model (Star Schema):

- **Fact Table: Sales_Fact**
    - **Grain**: Individual order items (Product sold in an order)
    - **Measures**: Quantity, Unit Price, Total Sale Amount, Discount Amount, Net Sale Amount, Payment Method, Dining Option
    - **Foreign Keys**: Branch ID, Customer ID, Product ID, Payment ID, Order ID, Date ID
- **Dimensions**:

1. **Date_Dim**: Time context (Date ID, Day, Month, Year, etc.)
2. **Branch_Dim**: Information about the branch (Branch ID, Location, etc.)
3. **Customer_Dim**: Customer details (Customer ID, Name, Loyalty Program, etc.)
4. **Product_Dim**: Product details (Product ID, Name, Category, Price, etc.)
5. **Payment_Dim**: Payment details (Payment ID, Payment Method, Gateway)
6. **Order_Dim**: Order-level information (Order ID, Total Amount, Dining Option)

This model will support Fufu Republic's goals of analyzing sales, managing inventory, and providing personalized promotions.