**Case Study: Manufacturing Production Scheduling System**

**Problem Statement:**

Design and implement a Manufacturing Production Scheduling System using Oracle SQL and PL/SQL. The system will be used to manage production lines, schedules, and machine maintenance activities. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle production scheduling, maintenance logging, and generating production and maintenance reports.

**Requirements:**

1. **Production Line Management**:
   * Implement the functionality to add, update, delete, and search for production lines.
   * Ensure that each production line has attributes such as LINE\_ID, LINE\_NAME, CAPACITY, and STATUS.
2. **Production Schedule Management**:
   * Implement the functionality to create, update, delete, and track production schedules.
   * Ensure that each schedule has attributes such as SCHEDULE\_ID, LINE\_ID, START\_DATE, END\_DATE, PRODUCT\_ID, and QUANTITY.
3. **Machine Maintenance Management**:
   * Implement the functionality to log and track machine maintenance activities.
   * Ensure that each maintenance record has attributes such as MAINTENANCE\_ID, LINE\_ID, MAINTENANCE\_DATE, DESCRIPTION, and STATUS.

**Tasks:**

1. **Design the Database Schema**:
   * Create the ProductionLines, Schedules, and Maintenance tables with the appropriate fields and constraints.
   * Define primary keys and foreign keys to maintain data integrity.
2. **Populate the Database with Sample Data**:
   * Insert sample records into the ProductionLines, Schedules, and Maintenance tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle production scheduling. The procedure should insert a new schedule record and update the line status.
   * Create a procedure to handle maintenance logging. The procedure should insert a new maintenance record and update the line status.
   * Create a procedure to generate production and maintenance reports, including details such as production line information, schedule details, and maintenance history.

**Expected Outcomes:**

1. **ProductionLines Table**:
   * Contains all information about the production lines available.
2. **Schedules Table**:
   * Tracks the production schedules for each production line.
3. **Maintenance Table**:
   * Logs the maintenance activities for each production line.
4. **PL/SQL Procedures**:
   * Efficiently manage production scheduling, maintenance logging, and generating production and maintenance reports, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the ProductionLines, Schedules, and Maintenance tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to handle production scheduling, maintenance logging, and generate production and maintenance reports.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **ProductionLines Table**:
   * **LINE\_ID**: Number, Primary Key
   * **LINE\_NAME**: Varchar2(100)
   * **CAPACITY**: Number
   * **STATUS**: Varchar2(50)
2. **Schedules Table**:
   * **SCHEDULE\_ID**: Number, Primary Key
   * **LINE\_ID**: Number, Foreign Key References ProductionLines(LINE\_ID)
   * **START\_DATE**: Date
   * **END\_DATE**: Date
   * **PRODUCT\_ID**: Number
   * **QUANTITY**: Number
3. **Maintenance Table**:
   * **MAINTENANCE\_ID**: Number, Primary Key
   * **LINE\_ID**: Number, Foreign Key References ProductionLines(LINE\_ID)
   * **MAINTENANCE\_DATE**: Date
   * **DESCRIPTION**: Varchar2(255)
   * **STATUS**: Varchar2(50)

**Case Study Task:**

* **Design**: Create the database schema as provided.
* **Implement**: Insert sample data into the tables.
* **Develop**: Write PL/SQL procedures for handling production scheduling, maintenance logging, and generating production and maintenance reports.
* **Test**: Test the procedures with various scenarios (e.g., scheduling production, logging maintenance, generating reports, ensuring proper updates).