**Case Study: Manufacturing Quality Control System**

**Problem Statement:**

Design and implement a Manufacturing Quality Control System using Oracle SQL and PL/SQL. The system will be used to manage products, quality inspections, defects, and corrective actions. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle inspection scheduling, defect logging, and generating quality reports.

**Requirements:**

1. **Product Management**:
   * Implement the functionality to add, update, delete, and search for products.
   * Ensure that each product has attributes such as PRODUCT\_ID, NAME, CATEGORY, DESCRIPTION, MANUFACTURING\_DATE, and BATCH\_NUMBER.
2. **Inspection Management**:
   * Implement the functionality to schedule and track quality inspections.
   * Ensure that each inspection has attributes such as INSPECTION\_ID, PRODUCT\_ID, INSPECTION\_DATE, INSPECTOR\_NAME, and RESULT.
3. **Defect Management**:
   * Implement the functionality to log and track defects found during inspections.
   * Ensure that each defect has attributes such as DEFECT\_ID, INSPECTION\_ID, DESCRIPTION, SEVERITY, and STATUS.
4. **Corrective Action Management**:
   * Implement the functionality to manage corrective actions for identified defects.
   * Ensure that each corrective action has attributes such as ACTION\_ID, DEFECT\_ID, DESCRIPTION, RESPONSIBLE\_PERSON, ACTION\_DATE, and STATUS.

**Tasks:**

1. **Design the Database Schema**:
   * Create the Products, Inspections, Defects, and CorrectiveActions 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 Products, Inspections, Defects, and CorrectiveActions tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle inspection scheduling. The procedure should insert a new inspection record.
   * Create a procedure to handle defect logging. The procedure should insert a new defect record and update the inspection result.
   * Create a procedure to generate quality reports, including details such as product information, inspection results, and defects.

**Expected Outcomes:**

1. **Products Table**:
   * Contains all information about the products manufactured.
2. **Inspections Table**:
   * Tracks the quality inspections for each product.
3. **Defects Table**:
   * Logs defects found during inspections.
4. **CorrectiveActions Table**:
   * Manages corrective actions taken to address identified defects.
5. **PL/SQL Procedures**:
   * Efficiently manage inspection scheduling, defect logging, and generating quality reports, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the Products, Inspections, Defects, and CorrectiveActions tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to handle inspection scheduling, defect logging, and generate quality reports.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **Products Table**:
   * **PRODUCT\_ID**: Number, Primary Key
   * **NAME**: Varchar2(100)
   * **CATEGORY**: Varchar2(50)
   * **DESCRIPTION**: Varchar2(255)
   * **MANUFACTURING\_DATE**: Date
   * **BATCH\_NUMBER**: Varchar2(50)
2. **Inspections Table**:
   * **INSPECTION\_ID**: Number, Primary Key
   * **PRODUCT\_ID**: Number, Foreign Key References Products(PRODUCT\_ID)
   * **INSPECTION\_DATE**: Date
   * **INSPECTOR\_NAME**: Varchar2(100)
   * **RESULT**: Varchar2(50)
3. **Defects Table**:
   * **DEFECT\_ID**: Number, Primary Key
   * **INSPECTION\_ID**: Number, Foreign Key References Inspections(INSPECTION\_ID)
   * **DESCRIPTION**: Varchar2(255)
   * **SEVERITY**: Varchar2(50)
   * **STATUS**: Varchar2(50)
4. **CorrectiveActions Table**:
   * **ACTION\_ID**: Number, Primary Key
   * **DEFECT\_ID**: Number, Foreign Key References Defects(DEFECT\_ID)
   * **DESCRIPTION**: Varchar2(255)
   * **RESPONSIBLE\_PERSON**: Varchar2(100)
   * **ACTION\_DATE**: Date
   * **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 inspection scheduling, defect logging, and generating quality reports.
* **Test**: Test the procedures with various scenarios (e.g., scheduling an inspection, logging a defect, generating reports, ensuring proper updates).