**Case Study: Logistics Management System**

**Problem Statement:**

Design and implement a Logistics Management System using Oracle SQL and PL/SQL. The system will be used to manage shipments, vehicles, drivers, and routes. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle shipment tracking, vehicle allocation, and generating delivery reports.

**Requirements:**

1. **Shipment Management**:
   * Implement the functionality to add, update, delete, and search for shipments.
   * Ensure that each shipment has attributes such as SHIPMENT\_ID, SHIPMENT\_DATE, ORIGIN, DESTINATION, STATUS, and ESTIMATED\_DELIVERY\_DATE.
2. **Vehicle Management**:
   * Implement the functionality to add, update, delete, and search for vehicles.
   * Ensure that each vehicle has attributes such as VEHICLE\_ID, TYPE, CAPACITY, STATUS, and CURRENT\_LOCATION.
3. **Driver Management**:
   * Implement the functionality to add, update, delete, and search for drivers.
   * Ensure that each driver has attributes such as DRIVER\_ID, FIRST\_NAME, LAST\_NAME, LICENSE\_NUMBER, and STATUS.
4. **Route Management**:
   * Implement the functionality to define and manage routes.
   * Ensure that each route has attributes such as ROUTE\_ID, START\_LOCATION, END\_LOCATION, DISTANCE, and ESTIMATED\_TRAVEL\_TIME.

**Tasks:**

1. **Design the Database Schema**:
   * Create the Shipments, Vehicles, Drivers, and Routes 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 Shipments, Vehicles, Drivers, and Routes tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle shipment tracking. The procedure should update the shipment status and current location.
   * Create a procedure to handle vehicle allocation. The procedure should assign a vehicle and driver to a shipment.
   * Create a procedure to generate delivery reports, including details such as shipment information, vehicle details, driver details, route information, and delivery status.

**Expected Outcomes:**

1. **Shipments Table**:
   * Contains all information about the shipments in the system.
2. **Vehicles Table**:
   * Contains details of all vehicles available for transporting shipments.
3. **Drivers Table**:
   * Contains details of all drivers available for driving vehicles.
4. **Routes Table**:
   * Contains details of all predefined routes for deliveries.
5. **PL/SQL Procedures**:
   * Efficiently manage shipment tracking, vehicle allocation, and generating delivery reports, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the Shipments, Vehicles, Drivers, and Routes tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to track shipments, allocate vehicles, and generate delivery reports.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **Shipments Table**:
   * **SHIPMENT\_ID**: Number, Primary Key
   * **SHIPMENT\_DATE**: Date
   * **ORIGIN**: Varchar2(100)
   * **DESTINATION**: Varchar2(100)
   * **STATUS**: Varchar2(20)
   * **ESTIMATED\_DELIVERY\_DATE**: Date
2. **Vehicles Table**:
   * **VEHICLE\_ID**: Number, Primary Key
   * **TYPE**: Varchar2(50)
   * **CAPACITY**: Number
   * **STATUS**: Varchar2(20)
   * **CURRENT\_LOCATION**: Varchar2(100)
3. **Drivers Table**:
   * **DRIVER\_ID**: Number, Primary Key
   * **FIRST\_NAME**: Varchar2(50)
   * **LAST\_NAME**: Varchar2(50)
   * **LICENSE\_NUMBER**: Varchar2(20)
   * **STATUS**: Varchar2(20)
4. **Routes Table**:
   * **ROUTE\_ID**: Number, Primary Key
   * **START\_LOCATION**: Varchar2(100)
   * **END\_LOCATION**: Varchar2(100)
   * **DISTANCE**: Number
   * **ESTIMATED\_TRAVEL\_TIME**: Number

**Case Study Task:**

* **Design**: Create the database schema as provided.
* **Implement**: Insert sample data into the tables.
* **Develop**: Write PL/SQL procedures for handling shipment tracking, vehicle allocation, and generating delivery reports.
* **Test**: Test the procedures with various scenarios (e.g., tracking a shipment, allocating a vehicle, generating reports, ensuring proper updates).