**Case Study: Student Management System**

**Problem Statement:**

Design and implement a Student Management System using Oracle SQL and PL/SQL. The system will be used to manage students, courses, enrollments, and grades. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle course enrollment, grade assignment, and generating student reports.

**Requirements:**

1. **Student Management**:
   * Implement the functionality to add, update, delete, and search for students.
   * Ensure that each student has attributes such as STUDENT\_ID, FIRST\_NAME, LAST\_NAME, DOB, GENDER, and EMAIL.
2. **Course Management**:
   * Implement the functionality to add, update, delete, and search for courses.
   * Ensure that each course has attributes such as COURSE\_ID, NAME, DESCRIPTION, CREDIT\_HOURS, and INSTRUCTOR.
3. **Enrollment Management**:
   * Implement the functionality to enroll students in courses, drop courses, and view enrollment status.
   * Ensure that each enrollment has attributes such as ENROLLMENT\_ID, STUDENT\_ID, COURSE\_ID, ENROLLMENT\_DATE, and GRADE.

**Tasks:**

1. **Design the Database Schema**:
   * Create the Students, Courses, and Enrollments 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 Students, Courses, and Enrollments tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle course enrollment. The procedure should check course availability, insert a new enrollment record, and update the student's course list.
   * Create a procedure to assign grades to students. The procedure should update the grade for a specific enrollment record.
   * Create a procedure to generate student reports, including details such as student information, course details, enrollment date, grade, and GPA.

**Expected Outcomes:**

1. **Students Table**:
   * Contains all information about the students enrolled in the system.
2. **Courses Table**:
   * Contains details of all courses offered in the system.
3. **Enrollments Table**:
   * Tracks the enrollment history, including enrollment details and grades.
4. **PL/SQL Procedures**:
   * Efficiently manage course enrollment, grade assignment, and generating student reports, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the Students, Courses, and Enrollments tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to enroll students, assign grades, and generate student reports.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **Students Table**:
   * **STUDENT\_ID**: Number, Primary Key
   * **FIRST\_NAME**: Varchar2(50)
   * **LAST\_NAME**: Varchar2(50)
   * **DOB**: Date
   * **GENDER**: Varchar2(10)
   * **EMAIL**: Varchar2(100)
2. **Courses Table**:
   * **COURSE\_ID**: Number, Primary Key
   * **NAME**: Varchar2(100)
   * **DESCRIPTION**: Varchar2(255)
   * **CREDIT\_HOURS**: Number
   * **INSTRUCTOR**: Varchar2(100)
3. **Enrollments Table**:
   * **ENROLLMENT\_ID**: Number, Primary Key
   * **STUDENT\_ID**: Number, Foreign Key References Students(STUDENT\_ID)
   * **COURSE\_ID**: Number, Foreign Key References Courses(COURSE\_ID)
   * **ENROLLMENT\_DATE**: Date
   * **GRADE**: Varchar2(2)

**Case Study Task:**

* **Design**: Create the database schema as provided.
* **Implement**: Insert sample data into the tables.
* **Develop**: Write PL/SQL procedures for enrolling students, assigning grades, and generating student reports.
* **Test**: Test the procedures with various scenarios (e.g., enrolling a student, assigning a grade, generating reports, ensuring proper updates).