Project Report

on

STUDENT RESULT MANAGEMENT SYSTEM

Submitted by

Samir Sharma

25MCI10391

Under the guidance of

Mr.Sachin Raj

in partial fulfilment for the award of the degree of

MASTER OF COMPUTER APPLICATIONS

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Chandigarh University

Nov 2025

Certificate

This is to certify that Samir Sharma, a student of Master of Computer Applications (MCA) – Artificial Intelligence & Machine Learning, has successfully completed the Minor Project titled

"STUDENT RESULT MANAGEMENT SYSTEM"

under the esteemed guidance of Mr. Sachin Raj, Assistant Professor, University Institute of Computing (UIC), Chandigarh University.

This project was undertaken as a part of the academic curriculum and is submitted in partial fulfilment of the requirements for the MCA program. The work presented in this project is a result of independent research, diligent effort, and dedication, demonstrating the student's ability to apply theoretical knowledge to practical problem-solving.

This project demonstrates how relational databases can be used to maintain the academic records of students. The application maintains student information (name, course, semester) and their corresponding results.

It uses two main tables — STUDENT and RESULT — linked by a foreign key (student_id).

The PL/SQL block is used to retrieve and display each student's name along with their grade.

I hereby confirm that this project is an original work carried out by the student and has not been submitted elsewhere for the award of any other degree, diploma, or certification.

Project Guide:
Mr.Sachin Raj
Assistant Professor
University Institute of Computing
Chandigarh University

Acknowledgement

I would like to express my sincere gratitude to Chandigarh University and the University Institute of Computing (UIC) for providing me with the opportunity to undertake this project,

“STUDENT RESULT MANAGEMENT SYSTEM.”

I extend my heartfelt appreciation to my esteemed mentor, Mr. Sachin Raj, Assistant Professor, for his invaluable guidance, continuous support, and insightful feedback throughout the project. His expertise in PL/SQL played a crucial role in the successful completion of this work.

I am also deeply grateful to my friends and peers for their encouragement and discussions, which helped refine my approach. Lastly, I thank my family for their unwavering support and motivation during this research.

This project has been an incredible learning experience, and I hope it serves as a strong foundation for further exploration in PL/SQL.

Samir Sharma

MCA – Artificial Intelligence & Machine Learning

Chandigarh University

Contents

1.Introduction

Student Result Management System

The Student Result Management System is a simple yet efficient database application designed to store, manage, and display student academic results.

It is implemented using Oracle PL/SQL (Procedural Language/Structured Query Language) — a procedural extension of SQL that allows developers to combine SQL statements with procedural constructs such as loops, variables, and conditions.

This project demonstrates how relational databases can be effectively used to maintain and manage academic records of students.

Key Features

- Maintains essential student information such as name, course, and semester.
- Stores corresponding academic results in a structured and relational format.
- Utilizes two main database tables:
  - STUDENT – contains student details.
  - RESULT – contains result details, linked to the STUDENT table via a foreign key (student_id).
- Employs a PL/SQL block to retrieve and display each student's name along with their corresponding grade.

Project Coverage

The project covers:

- Database design using relational concepts.
- Data manipulation using SQL and PL/SQL statements.
- Retrieval and presentation of academic records dynamically.

2.Objective

The main objectives of the Student Result Management System project are as follows:

- To understand and implement database design principles using PL/SQL.
- To develop a relational database incorporating real-world constraints such as primary and foreign keys.
- To demonstrate the use of PL/SQL blocks for providing procedural control over SQL statements.
- To display the final student results using loops and conditional logic for dynamic data retrieval.
- To handle database errors gracefully, including issues such as duplicate tables or foreign key violations.

By the end of this project, the learner gains practical experience in:

- Database programming,
- Query handling, and
- Procedural execution within Oracle PL/SQL

3.Tools and Technologies Used

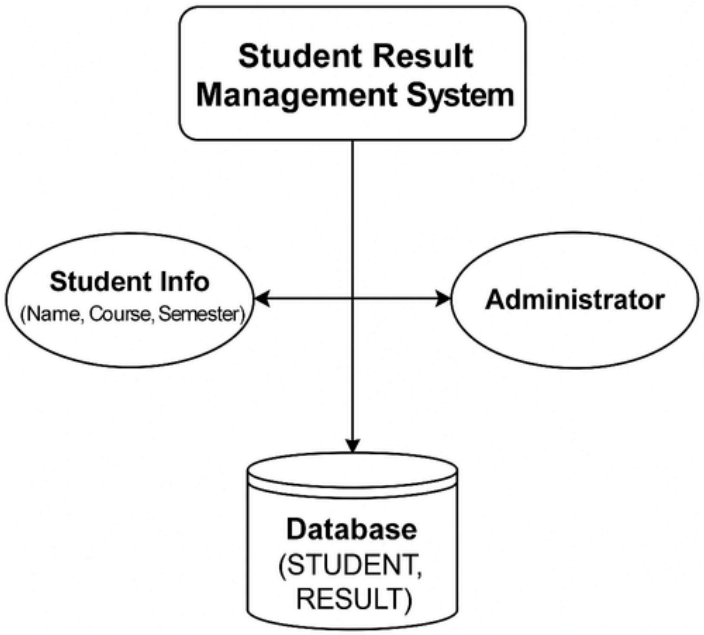
Tool	Purpose
Oracle SQL Developer / Live SQL	For writing, testing, and executing SQL and PL/SQL code
Oracle Database ١١g / ١٢c	For creating and storing tables and data
PL /SQL	Procedural extension to SQL for creating blocks, loops, and logic
DBMS_OUTPUT Package	To print results and messages on the console
Operating System	Windows / Linux
Text Editor (Optional)	For writing and saving SQL scripts

4. Data Flow Diagrams (DFD'S)

The Student Result Management System can be represented using Data Flow Diagrams (DFDs) to visualize how data moves within the system. These diagrams illustrate the flow of information between processes, data stores, and external entities.

Level 0 DFD (Context Diagram)

The Level 0 DFD provides an overview of the entire system as a single process interacting with external entities.

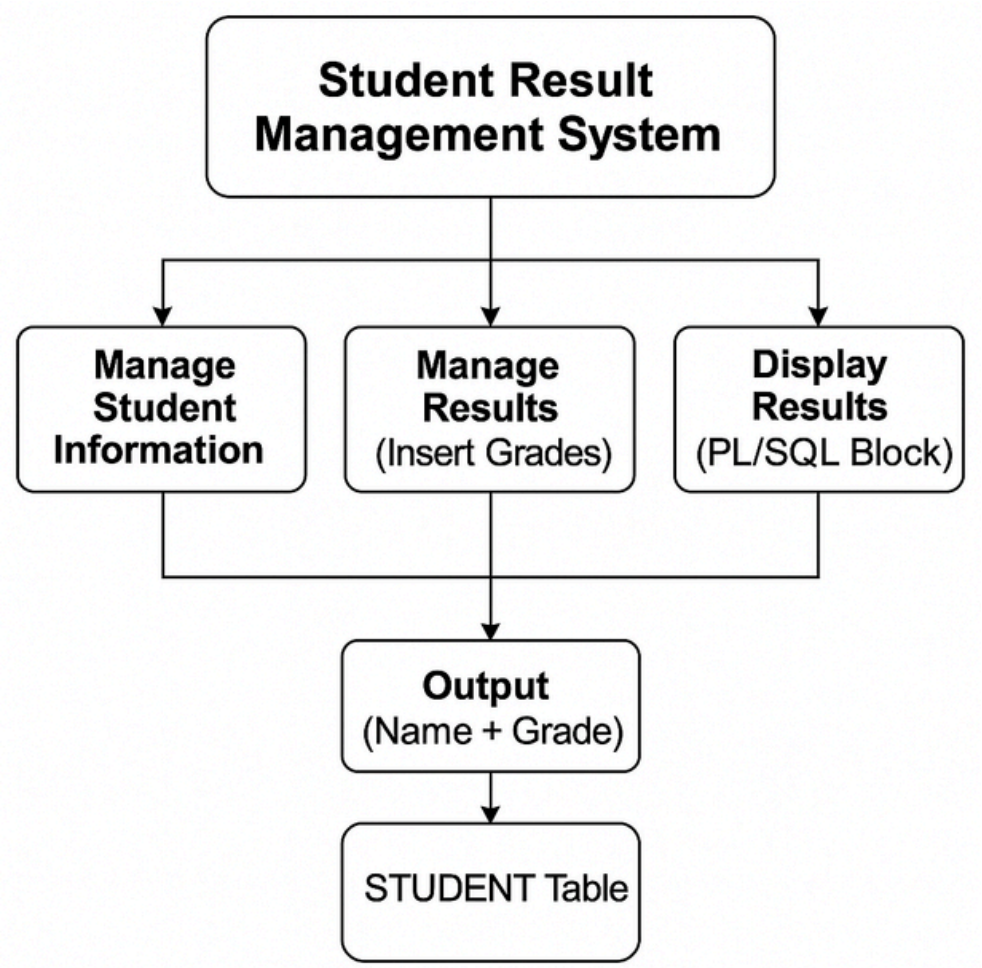


Description:

- Student submits details and views results.
- Administrator inserts or updates data.
- The system interacts with the database to store and retrieve information.

Level 1 DFD

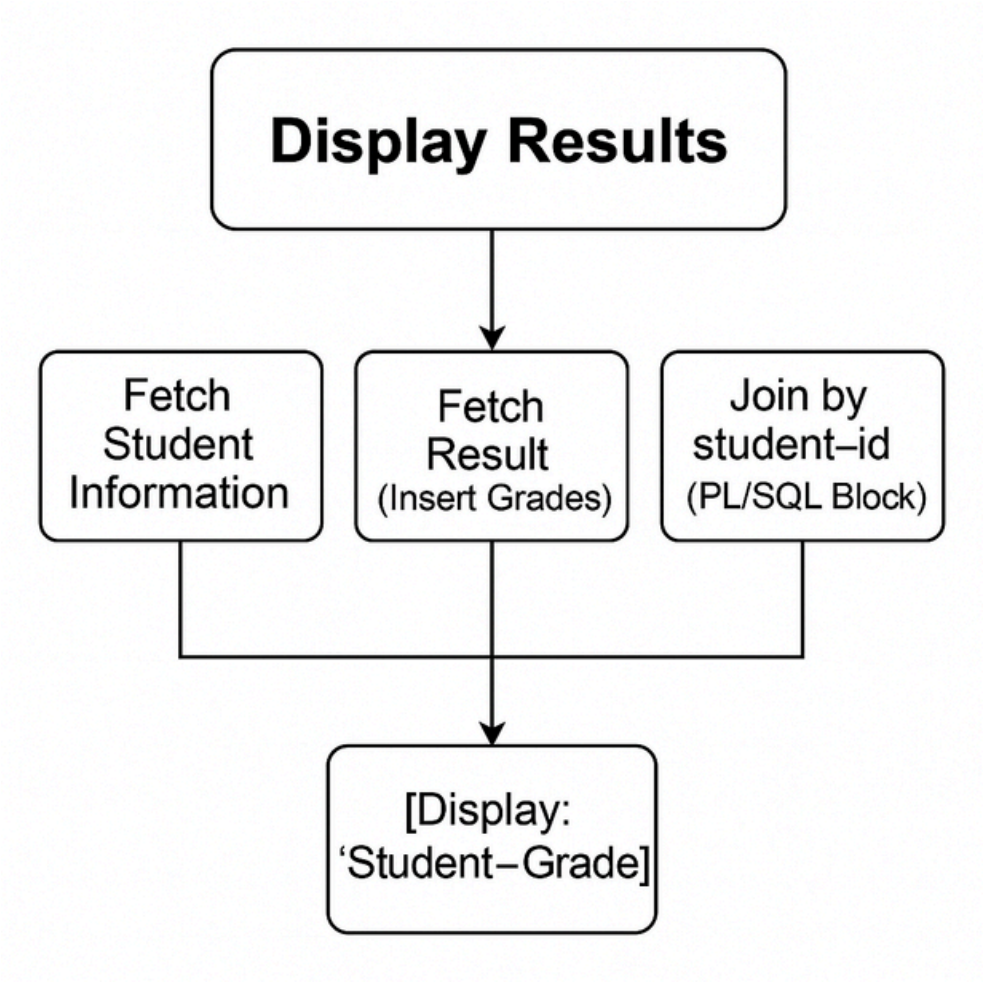
This level breaks the system into three main processes:



Data Flow Explanation:

1. Manage Student Information: Accepts student details and stores them in the STUDENT table.
2. Manage Results: Inserts grades in the RESULT table linked by student_id.
3. Display Results: Uses a PL/SQL block to join both tables and display student names with their grades.

Level 2 DFD (Detailed – Display Results)



Process Summary:

- Retrieves student and result data.
- Joins tables using student_id.
- Displays each student's name with their grade using PL/SQL loops and output procedures.

5. Implementation Steps

This section explains each step of the project implementation along with the corresponding code and logic.

Step 1: Creating Tables
We begin by creating two main tables — STUDENT and RESULT.
Code:

```
CREATE TABLE student (
    student_id VARCHAR2(10) PRIMARY KEY,
    name VARCHAR2(50),
    course VARCHAR2(30),
    semester NUMBER
);

CREATE TABLE result (
    student_id VARCHAR2(10),
    grade CHAR(2),
    FOREIGN KEY (student_id) REFERENCES student(student_id)
);
```

Description:

- The student table stores student details such as ID, name, course, and semester.
- The result table stores the grades of each student and references student_id as a foreign key.

Step 2: Inserting Data into Tables
We insert sample student records and their corresponding results.
Code:

```
INSERT INTO student VALUES ('S101', 'Aarav Sharma', 'BCA', 5);
INSERT INTO student VALUES ('S102', 'Riya Singh', 'BCA', 5);
INSERT INTO student VALUES ('S103', 'Kunal Mehta', 'BCA', 5);

INSERT INTO result VALUES ('S101', 'A');
INSERT INTO result VALUES ('S102', 'B');
INSERT INTO result VALUES ('S103', 'A');
```

Description:
This step populates the database with sample data for demonstration purposes.

Step 3: Displaying the Table Data
Code:

```
SELECT * FROM student;
SELECT * FROM result;
```

Description:
Displays all the records stored in the student and result tables.

Step 4: Writing the PL/SQL Block

```
SET SERVEROUTPUT ON;

DECLARE
   v_name student.name%TYPE;
   v_grade result.grade%TYPE;
BEGIN
   FOR rec IN (
      SELECT s.name, r.grade
      FROM student s
      JOIN result r
      ON s.student_id = r.student_id
   )
   LOOP
      DBMS_OUTPUT.PUT_LINE('Student: ' || rec.name || ' - Grade: ' ||
rec.grade);
   END LOOP;
END;
/
```

Description:

- The block uses a cursor FOR loop to fetch and display each student's name and grade.
- The DBMS_OUTPUT.PUT_LINE procedure prints the results on the console.

Logic Flow

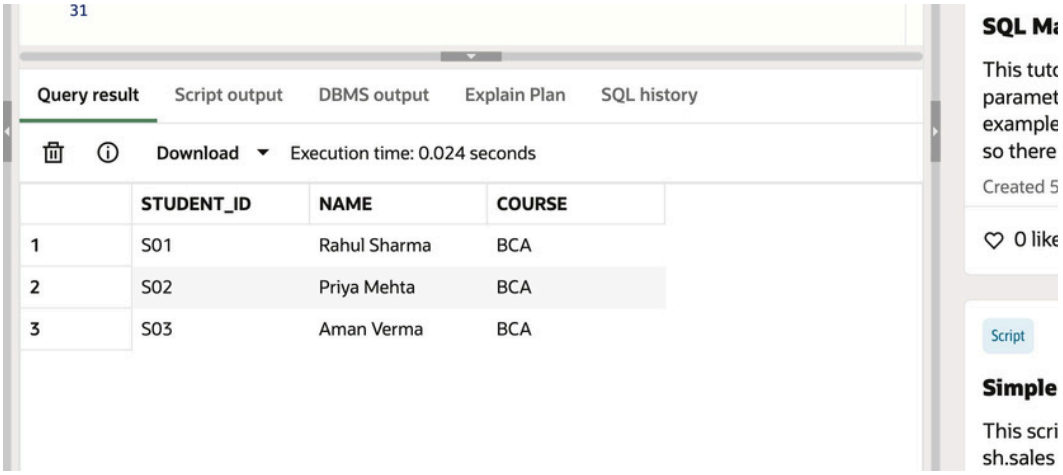
1. Fetch all records using a JOIN between student and result tables.
2. Loop through the results sequentially.
3. Print each student's name and corresponding grade.

Step 5: Error Handling

Common errors encountered during implementation and their respective solutions are listed below:

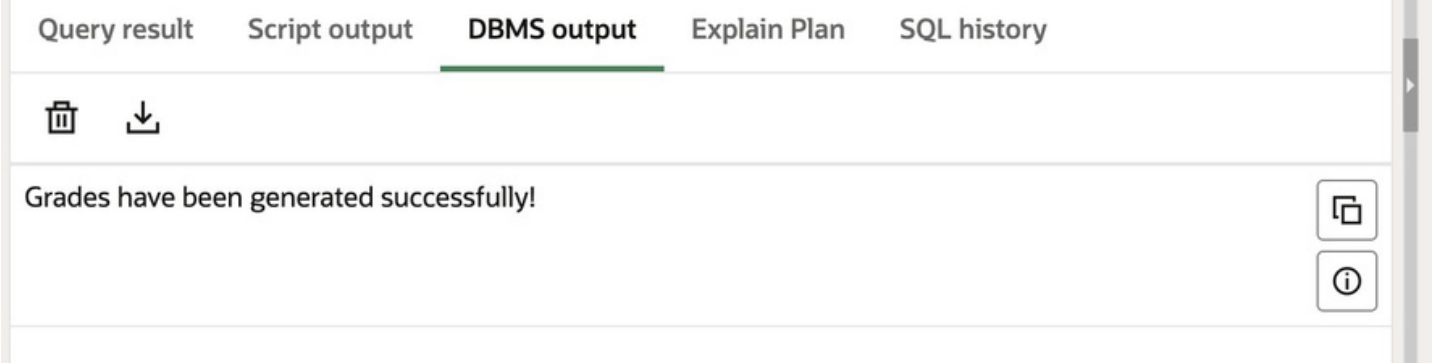
Error Code	Description	Solution
ORA-00955	Table name already exists	Use DROP TABLE table_name;
ORA-02449	Foreign key reference exists	Drop child table (**result**) before dropping parent (**student**).
ORA-02291	Foreign key constraint fails	Ensure the referenced student record exists before inserting into **result**

6. Screenshots / Outputs



```
STUDENT_ID SUBJECT MARKS
---------- ------- -----
S01        DBMS    85
S02        OS      92
S03        CN      65
S01        DBMS    85
S02        OS      92
S03        CN      65

Elapsed: 00:00:00.006
6 rows selected.
```



student id	name	course	bject	marks	grade
S01	Rahul	BCA	DBMS	85	B
S02	Priya	BCA	OS	92	A
S03	Aman	BCA	CN	65	C

7. Conclusion

The Student Result Management System project successfully demonstrates how SQL and PL/SQL can be used together to build a database-driven application.
The project emphasizes the use of relational integrity, loops, and procedural control for efficient data management.
Key Learnings

- Creating relational tables with constraints.
- Inserting and managing data in Oracle SQL.
- Using PL/SQL blocks for logic implementation.
- Debugging and handling common SQL errors.

This mini-project serves as a foundation for advanced database systems, including student management, payroll, and inventory management systems.

7. References

1.Oracle PL/SQL Developer Documentation – https://docs.oracle.com/en/database/

2.W3Schools SQL Tutorial – https://www.w3schools.com/sql/

3.GeeksforGeeks PL/SQL Tutorial – https://www.geeksforgeeks.org/pl-sql/

4.Oracle Live SQL Playground – https://livesql.oracle.com/