

**Dhaka International University
Department of CSE**

Course Code: 0612-304

Course Title: Database Management System Lab

**Project Proposal on
Student Result Management System**

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Overview

It's a centralized digital platform for result management. Teachers can input marks → System calculates grades → Students can view results securely. Built using database design concepts: entities, relationships, and normalization.

Tables: Student, Teacher, Course, Result, ResultDetails, Enrolls, Conducts, etc.

Objectives

- ❖ Efficiently store and manage students' academic records digitally.
- ❖ Automatically generate accurate result sheets from stored marks.
- ❖ Minimize human errors in result calculation and management.
- ❖ Allow authorized teachers and administrators to input, update, and manage marks.

Problem Statement

Many educational institutions rely on manual or semi-manual methods to store and process student academic results. This leads to several issues such as delayed result generation, human errors in calculations, duplication of data, and difficulty in access for both staff and students. Manual processing is also labor-intensive, time-consuming, and prone to data loss or unauthorized access, negatively affecting the accuracy and timely delivery of student performance information.

Solution Statement

The Student Result Management System will automate the collection, storage, and processing of students' academic data. This centralized digital system will enable teachers to input marks easily, automatically calculate final results and grades, and allow students to securely view their results anytime. The system will enhance data accuracy, reduce administrative workload, and provide faster access to academic performance information.

Entities

✓ Strong Entities:

➤ Student

student_id (PK)
name
email
address
reg_number
department
batch
roll
date_of_birth
age

➤ Course

course_code (PK)
course_title
credit

➤ Teacher

teacher_id (PK)
name
email
department

➤ Result

result_id (PK)
student_id (FK)
course_code (FK)
teacher_id (FK)
marks
cgpa
grade

✓ Weak Entities

➤ ResultDetails

result_id (FK)
marks
course_code (FK)
exam_type
remarks

ER Diagram (without relationship)

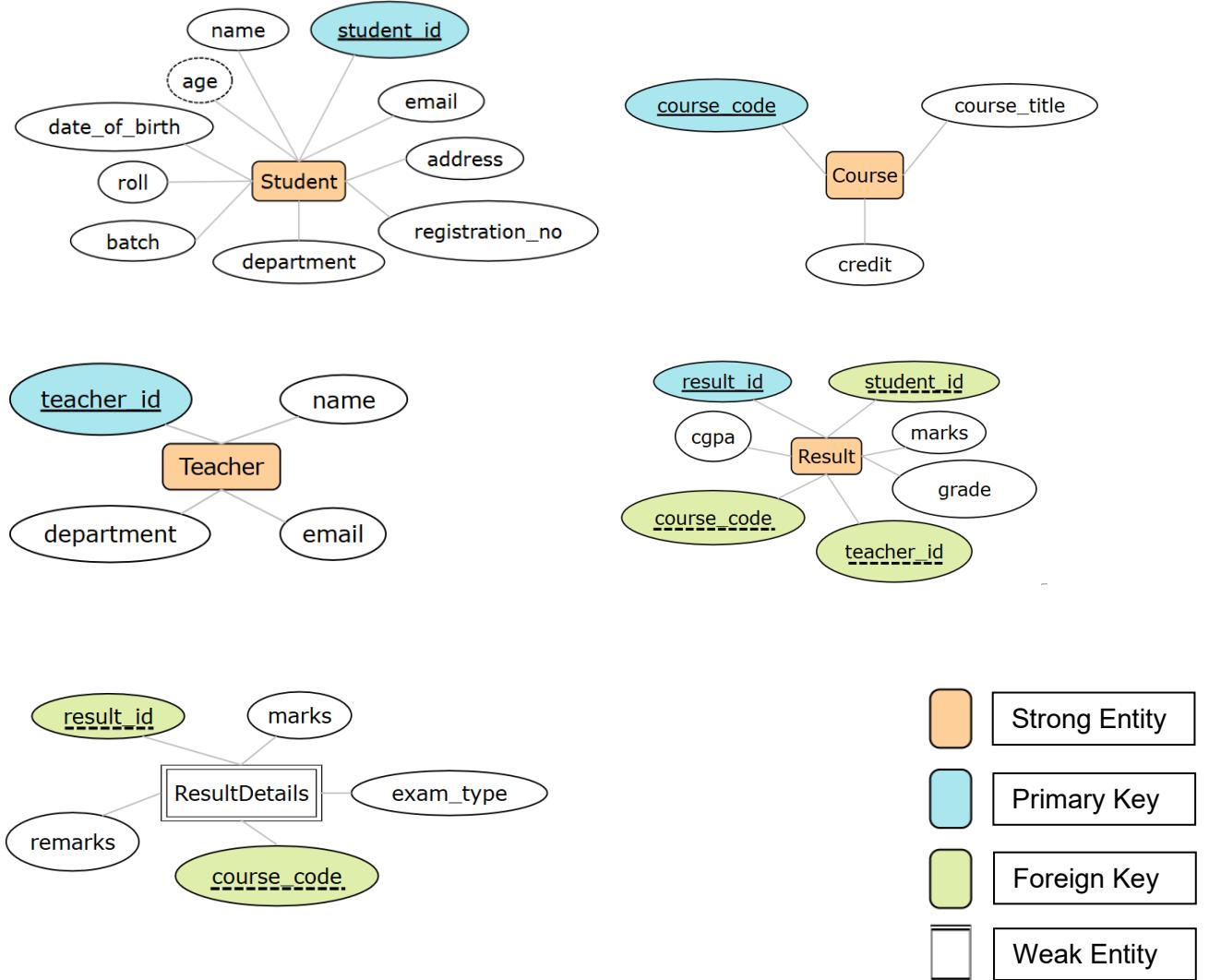


Figure 1: ER diagram of Student Result Management System without relationship

Relationships

- ❖ A student can enroll in many courses, and each course can have many students.
→ **Many-to-Many (M:N)**
- ❖ One teacher can teach many courses, also each course is taught by many teacher.
→ **One-to-Many (N:M)**
- ❖ One student can have many results (for different courses).
→ **One-to-Many (1:M)**
- ❖ One course can have many results (for different students).
→ **One-to-Many (1:M)**
- ❖ Each result has its detailed information like marks, grade, percentage, etc.
→ **One-to-One (1:1) (if multiple details stored)**

ER Diagram (with relationship)

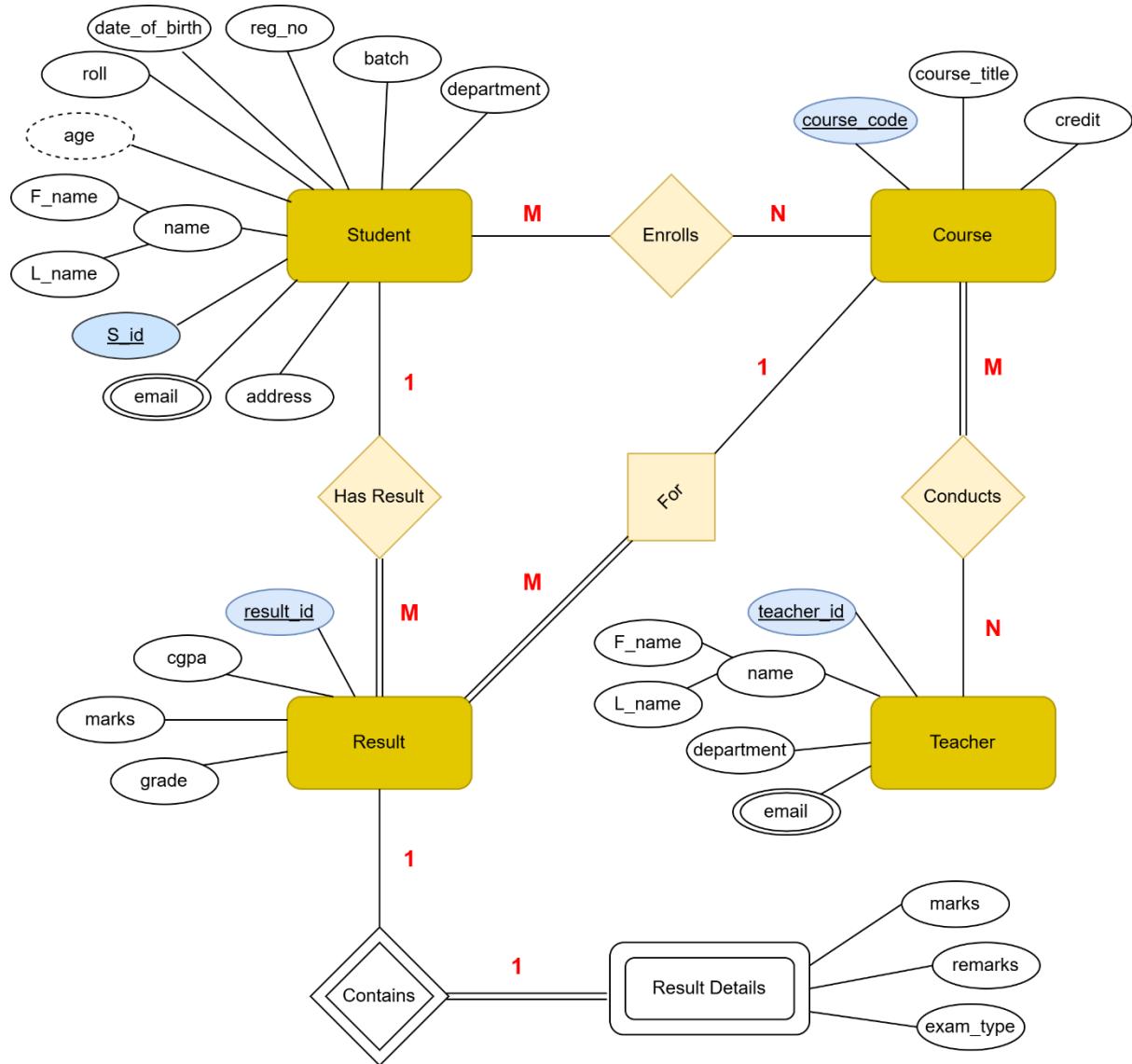


Figure 2: ER diagram of Student Result Management System with relationship

Mapping

1. Student:

Student_id	F_name	L_name	roll	address	Reg_no	DoB	Batch	Department
------------	--------	--------	------	---------	--------	-----	-------	------------

2. Student Email:

Student_id	S_Email
------------	---------

3. Course:

Course_id	Course_title	credit	Teacher_id
-----------	--------------	--------	------------

4. Teacher:

Teacher_id	F_name	L_name	Department
------------	--------	--------	------------

5. Teacher Email:

Teacher_id	Teacher_Email
------------	---------------

6. Result:

Result_id	cgpa	grade	marks	Course_id	Student_id
-----------	------	-------	-------	-----------	------------

7. Result Details:

Result_id	remarks	Exam_type
-----------	---------	-----------

8. Enrolls:

Student_id	Course_id
------------	-----------

9. Conducts:

Course_id	Teacher_id
-----------	------------

Data Base

1. Create Database:

```
create Database student_result_management_system_d87;
```

2. Student Table:

```
2
3 • CREATE TABLE Student (
4     Student_id INT PRIMARY KEY,
5     F_name VARCHAR(30) NOT NULL,
6     L_name VARCHAR(30) NOT NULL,
7     roll INT UNIQUE NOT NULL,
8     address VARCHAR(100),
9     Reg_no VARCHAR(20) UNIQUE NOT NULL,
10    DoB DATE NOT NULL,
11    Batch VARCHAR(10) NOT NULL,
12    Department VARCHAR(30) NOT NULL
13 );
14
15 • INSERT INTO Student VALUES
16 (1, 'Nusrat', 'Jahan', 101, 'Badda, Dhaka', 'REG2025001', '2004-03-15', '56', 'CSE'),
17 (2, 'Rafi', 'Hasan', 102, 'Mirpur, Dhaka', 'REG2025002', '2003-07-22', '56', 'CSE'),
18 (3, 'Mitu', 'Akter', 103, 'Uttara, Dhaka', 'REG2025003', '2004-01-10', '57', 'EEE'),
19 (4, 'Sami', 'Rahman', 104, 'Banani, Dhaka', 'REG2025004', '2003-04-09', '57', 'CSE'),
20 (5, 'Tanha', 'Khan', 105, 'Dhanmondi, Dhaka', 'REG2025005', '2004-02-05', '58', 'BBA'),
21 (6, 'Arif', 'Hossain', 106, 'Badda, Dhaka', 'REG2025006', '2003-12-12', '56', 'EEE'),
22 (7, 'Farzana', 'Noor', 107, 'Mirpur, Dhaka', 'REG2025007', '2004-05-15', '57', 'CSE'),
23 (8, 'Imran', 'Ali', 108, 'Uttara, Dhaka', 'REG2025008', '2003-06-22', '58', 'CSE'),
24 (9, 'Sadia', 'Rahim', 109, 'Banani, Dhaka', 'REG2025009', '2004-07-09', '59', 'BBA'),
25 (10, 'Naeem', 'Islam', 110, 'Dhanmondi, Dhaka', 'REG2025010', '2003-09-21', '56', 'EEE');
```

Student Table (Output):

	Student_id	F_name	L_name	roll	address	Reg_no	DoB	Batch	Department
▶	1	Nusrat	Jahan	101	Badda, Dhaka	REG2025001	2004-03-15	56	CSE
	2	Rafi	Hasan	102	Mirpur, Dhaka	REG2025002	2003-07-22	56	CSE
	3	Mitu	Akter	103	Uttara, Dhaka	REG2025003	2004-01-10	57	EEE
	4	Sami	Rahman	104	Banani, Dhaka	REG2025004	2003-04-09	57	CSE
	5	Tanha	Khan	105	Dhanmondi, Dhaka	REG2025005	2004-02-05	58	BBA
	6	Arif	Hossain	106	Badda, Dhaka	REG2025006	2003-12-12	56	EEE
	7	Farzana	Noor	107	Mirpur, Dhaka	REG2025007	2004-05-15	57	CSE
	8	Imran	Ali	108	Uttara, Dhaka	REG2025008	2003-06-22	58	CSE
	9	Sadia	Rahim	109	Banani, Dhaka	REG2025009	2004-07-09	59	BBA
	10	Naeem	Islam	110	Dhanmondi, Dhaka	REG2025010	2003-09-21	56	EEE
*	HULL	HULL	HULL	HULL	HULL	HULL	HULL	HULL	HULL

3. Student Email Table:

```
28 • CREATE TABLE Student_Email (
29     Student_id INT NOT NULL,
30     S_Email VARCHAR(50) UNIQUE NOT NULL,
31     FOREIGN KEY (Student_id) REFERENCES Student(Student_id)
32 );
33
34 • INSERT INTO Student_Email VALUES
35     (1, 'nusrat@gmail.com'),
36     (2, 'rafi@gmail.com'),
37     (3, 'mitu@gmail.com'),
38     (4, 'sami@gmail.com'),
39     (5, 'tanha@gmail.com'),
40     (6, 'arif@gmail.com'),
41     (7, 'farzana@gmail.com'),
42     (8, 'imran@gmail.com'),
43     (9, 'sadia@gmail.com'),
44     (10, 'naeem@gmail.com');
```

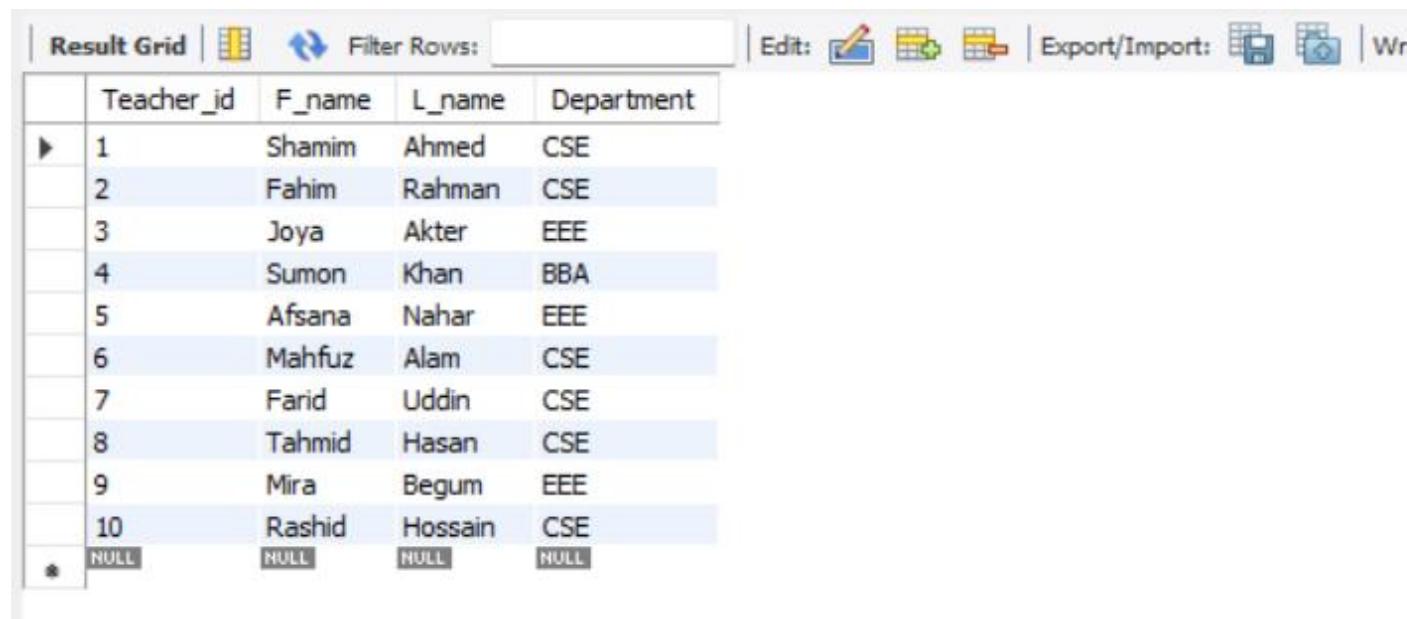
Student Email Table (Output):

Result Grid		Filter Rows:	Edit:	Export/Import:	Wrap Cell Content:
	Student_id	S_Email			
▶	1	nusrat@gmail.com			
	2	rafi@gmail.com			
	3	mitu@gmail.com			
	4	sami@gmail.com			
	5	tanha@gmail.com			
	6	arif@gmail.com			
	7	farzana@gmail.com			
	8	imran@gmail.com			
	9	sadia@gmail.com			
	10	naeem@gmail.com			
*	HULL	NULL			

4. Teacher Table:

```
47 • CREATE TABLE Teacher (
48     Teacher_id INT PRIMARY KEY,
49     F_name VARCHAR(30) NOT NULL,
50     L_name VARCHAR(30) NOT NULL,
51     Department VARCHAR(30) NOT NULL
52 );
53
54 • INSERT INTO Teacher VALUES
55     (1, 'Shamim', 'Ahmed', 'CSE'),
56     (2, 'Fahim', 'Rahman', 'CSE'),
57     (3, 'Joya', 'Akter', 'EEE'),
58     (4, 'Sumon', 'Khan', 'BBA'),
59     (5, 'Afsana', 'Nahar', 'EEE'),
60     (6, 'Mahfuz', 'Alam', 'CSE'),
61     (7, 'Farid', 'Uddin', 'CSE'),
62     (8, 'Tahmid', 'Hasan', 'CSE'),
63     (9, 'Mira', 'Begum', 'EEE'),
64     (10, 'Rashid', 'Hossain', 'CSE');
```

Teacher Table (Output):



The screenshot shows the MySQL Workbench interface with the 'Result Grid' tab selected. The grid displays the data from the Teacher table. The columns are labeled Teacher_id, F_name, L_name, and Department. The data consists of 10 rows, each representing a teacher with their ID, first name, last name, and department. Row 10 is marked with an asterisk (*) and contains all NULL values.

	Teacher_id	F_name	L_name	Department
▶	1	Shamim	Ahmed	CSE
	2	Fahim	Rahman	CSE
	3	Joya	Akter	EEE
	4	Sumon	Khan	BBA
	5	Afsana	Nahar	EEE
	6	Mahfuz	Alam	CSE
	7	Farid	Uddin	CSE
	8	Tahmid	Hasan	CSE
*	9	Mira	Begum	EEE
	10	Rashid	Hossain	CSE
*	NULL	NULL	NULL	NULL

5. Teacher Email Table:

```
67 • CREATE TABLE Teacher_Email (
68     Teacher_id INT NOT NULL,
69     Teacher_Email VARCHAR(50) UNIQUE NOT NULL,
70     FOREIGN KEY (Teacher_id) REFERENCES Teacher(Teacher_id)
71 );
72
73 • INSERT INTO Teacher_Email VALUES
74     (1, 'shamim@univ.com'),
75     (2, 'fahim@univ.com'),
76     (3, 'joya@univ.com'),
77     (4, 'sumon@univ.com'),
78     (5, 'afsana@univ.com'),
79     (6, 'mahfuz@univ.com'),
80     (7, 'farid@univ.com'),
81     (8, 'tahmid@univ.com'),
82     (9, 'mira@univ.com'),
83     (10, 'rashid@univ.com);
84
```

Teacher Email Table (Output):

Result Grid		Filter Rows:	Edit:	Export/Import:	Wrap Cell
	Teacher_id	Teacher_Email			
▶	1	shamim@univ.com			
	2	fahim@univ.com			
	3	joya@univ.com			
	4	sumon@univ.com			
	5	afsana@univ.com			
	6	mahfuz@univ.com			
	7	farid@univ.com			
	8	tahmid@univ.com			
	9	mira@univ.com			
	10	rashid@univ.com			
*	NULL	NULL			

6. Course Table:

```
86 • CREATE TABLE Course (
87     Course_id INT PRIMARY KEY,
88     Course_title VARCHAR(50) NOT NULL,
89     credit INT DEFAULT 3,
90     Teacher_id INT NOT NULL,
91     FOREIGN KEY (Teacher_id) REFERENCES Teacher(Teacher_id)
92 );
93
94 • INSERT INTO Course VALUES
95     (101, 'Database Systems', 3, 1),
96     (102, 'Digital Logic', 3, 2),
97     (103, 'Data Structures', 3, 3),
98     (104, 'Accounting', 2, 4),
99     (105, 'Electronics', 3, 5),
100    (106, 'AI Fundamentals', 3, 6),
101    (107, 'Web Development', 3, 7),
102    (108, 'Networking', 3, 8),
103    (109, 'Microprocessor', 3, 9),
104    (110, 'Machine Learning', 3, 10);
```

Course Table (Output):

	Course_id	Course_title	credit	Teacher_id
▶	101	Database Systems	3	1
	102	Digital Logic	3	2
	103	Data Structures	3	3
	104	Accounting	2	4
	105	Electronics	3	5
	106	AI Fundamentals	3	6
	107	Web Development	3	7
	108	Networking	3	8
	109	Microprocessor	3	9
	110	Machine Learning	3	10
*	NULL	NULL	NULL	NULL

7. Result Table:

```
108 • CREATE TABLE Result (
109     Result_id INT PRIMARY KEY,
110     cgpa FLOAT CHECK (cgpa BETWEEN 0.00 AND 4.00) NOT NULL,
111     grade CHAR(2) NOT NULL,
112     marks INT CHECK (marks BETWEEN 0 AND 100) NOT NULL,
113     Course_id INT NOT NULL,
114     Student_id INT NOT NULL,
115     FOREIGN KEY (Course_id) REFERENCES Course(Course_id),
116     FOREIGN KEY (Student_id) REFERENCES Student(Student_id)
117 );
118
119 • INSERT INTO Result VALUES
120     (1, 3.80, 'A', 85, 101, 1),
121     (2, 3.50, 'A-', 78, 102, 2),
122     (3, 3.60, 'A-', 81, 103, 3),
123     (4, 3.90, 'A', 88, 104, 4),
124     (5, 3.70, 'A-', 83, 105, 5),
125     (6, 3.20, 'B+', 75, 106, 6),
126     (7, 3.00, 'B', 70, 107, 7),
127     (8, 3.85, 'A', 86, 108, 8),
128     (9, 3.40, 'A-', 79, 109, 9),
129     (10, 3.95, 'A+', 90, 110, 10);
130
```

Result Table (Output):

The screenshot shows the MySQL Workbench interface with the 'Result Grid' tab selected. The table has columns: Result_id, cgpa, grade, marks, Course_id, and Student_id. The data is as follows:

	Result_id	cgpa	grade	marks	Course_id	Student_id
▶	1	3.8	A	85	101	1
	2	3.5	A-	78	102	2
	3	3.6	A-	81	103	3
	4	3.9	A	88	104	4
	5	3.7	A-	83	105	5
	6	3.2	B+	75	106	6
	7	3	B	70	107	7
	8	3.85	A	86	108	8
	9	3.4	A-	79	109	9
*	10	3.95	A+	90	110	10
*	NULL	NULL	NULL	NULL	NULL	NULL

8. Result Details Table:

```
132 • CREATE TABLE Result_Details (
133     Result_id INT NOT NULL,
134     remarks VARCHAR(50),
135     Exam_type VARCHAR(20) NOT NULL,
136     FOREIGN KEY (Result_id) REFERENCES Result(Result_id)
137 );
138
139 • INSERT INTO Result_Details VALUES
140     (1, 'Excellent', 'Final'),
141     (2, 'Good', 'Mid'),
142     (3, 'Very Good', 'Final'),
143     (4, 'Outstanding', 'Final'),
144     (5, 'Satisfactory', 'Mid'),
145     (6, 'Average', 'Mid'),
146     (7, 'Improved', 'Final'),
147     (8, 'Excellent', 'Final'),
148     (9, 'Good', 'Mid'),
149     (10, 'Top Score', 'Final');
150
```

Result Details Table (Output):

	Result_id	remarks	Exam_type
▶	1	Excellent	Final
	2	Good	Mid
	3	Very Good	Final
	4	Outstanding	Final
	5	Satisfactory	Mid
	6	Average	Mid
	7	Improved	Final
	8	Excellent	Final
	9	Good	Mid
	10	Top Score	Final

9. Enrolls Table:

```
152 • CREATE TABLE Enrolls (
153     Student_id INT NOT NULL,
154     Course_id INT NOT NULL,
155     PRIMARY KEY (Student_id, Course_id),
156     FOREIGN KEY (Student_id) REFERENCES Student(Student_id),
157     FOREIGN KEY (Course_id) REFERENCES Course(Course_id)
158 );
159
160 • INSERT INTO Enrolls VALUES
161     (1, 101),
162     (2, 102),
163     (3, 103),
164     (4, 104),
165     (5, 105),|
166     (6, 106),
167     (7, 107),
168     (8, 108),
169     (9, 109),
170     (10, 110);
```

Enrolls Table (Output):

	Student_id	Course_id
▶	1	101
	2	102
	3	103
	4	104
	5	105
	6	106
	7	107
	8	108
	9	109
	10	110
*	NULL	NULL

10. Conducts Table:

```
172
173 • CREATE TABLE Conducts (
174     Course_id INT NOT NULL,
175     Teacher_id INT NOT NULL,
176     PRIMARY KEY (Course_id, Teacher_id),
177     FOREIGN KEY (Course_id) REFERENCES Course(Course_id),
178     FOREIGN KEY (Teacher_id) REFERENCES Teacher(Teacher_id)
179 );
180
181 • INSERT INTO Conducts VALUES
182     (101, 1),
183     (102, 2),
184     (103, 3),
185     (104, 4),
186     (105, 5),
187     (106, 6),
188     (107, 7),
189     (108, 8),
190     (109, 9),
191     (110, 10);
```

Conducts Table (Output):

The screenshot shows the MySQL Workbench interface with the 'Result Grid' tab selected. The grid displays the data from the 'Conducts' table. The columns are labeled 'Course_id' and 'Teacher_id'. The data consists of 11 rows, each containing a unique course ID and teacher ID pair. The last row is a placeholder with 'NULL' values.

	Course_id	Teacher_id
▶	101	1
	102	2
	103	3
	104	4
	105	5
	106	6
	107	7
	108	8
	109	9
◀	110	10
*	NULL	NULL

Logical Sql Queries

1. Show all students with their email addresses:

1. Show all students with their email addresses

```
SELECT S.Student_id, CONCAT(S.F_name, ' ', S.L_name) AS Student_Name, SE.S_Email  
FROM Student S  
JOIN Student_Email SE ON S.Student_id = SE.Student_id;
```

Output:

	Student_id	Student_Name	S_Email
▶	1	Nusrat Jahan	nusrat@gmail.com
	2	Rafi Hasan	rafi@gmail.com
	3	Mitu Akter	mitu@gmail.com
	4	Sami Rahman	sami@gmail.com
	5	Tanha Khan	tanha@gmail.com
	6	Arif Hossain	arif@gmail.com
	7	Farzana Noor	farzana@gmail.com
	8	Imran Ali	imran@gmail.com
	9	Sadia Rahim	sadia@gmail.com
	10	Naeem Islam	naeem@gmail.com

2. List all students with their department and batch:

2. List all students with their department and batch

```
SELECT F_name, L_name, Department, Batch  
FROM Student;
```

Output:

	F_name	L_name	Department	Batch
▶	Nusrat	Jahan	CSE	56
	Rafi	Hasan	CSE	56
	Mitu	Akter	EEE	57
	Sami	Rahman	CSE	57
	Tanha	Khan	BBA	58
	Arif	Hossain	EEE	56
	Farzana	Noor	CSE	57
	Imran	Ali	CSE	58
	Sadia	Rahim	BBA	59
	Naeem	Islam	EEE	56

3.Find students who scored more than 3.80 CGPA:

3. Find students who scored more than 3.80 CGPA

```
SELECT S.F_name, S.L_name, R.cgpa, R.grade
FROM Student S
JOIN Result R ON S.Student_id = R.Student_id
WHERE R.cgpa > 3.80;
```

Output:

	F_name	L_name	cgpa	grade
▶	Sami	Rahman	3.9	A
	Imran	Ali	3.85	A
	Naeem	Islam	3.95	A+

4.Find which teacher conducts which course:

4. Find which teacher conducts which course

```
SELECT T.F_name AS Teacher, C.Course_title
FROM Teacher T
JOIN Conducts Co ON T.Teacher_id = Co.Teacher_id
JOIN Course C ON Co.Course_id = C.Course_id;
```

Output:

	Teacher	Course_title
▶	Shamim	Database Systems
	Fahim	Digital Logic
	Joya	Data Structures
	Sumon	Accounting
	Afsana	Electronics
	Mahfuz	AI Fundamentals
	Farid	Web Development
	Tahmid	Networking
	Mira	Microprocessor
	Rashid	Machine Learning

5. Show all results with remarks and exam type:

5. Show all results with remarks and exam type

```
SELECT R.Result_id, S.F_name, S.L_name, R.grade, R.cgpa, RD.remarks, RD.Exam_type
FROM Result R
JOIN Student S ON R.Student_id = S.Student_id
JOIN Result_Details RD ON R.Result_id = RD.Result_id;
```

Output:

	Result_id	F_name	L_name	grade	cgpa	remarks	Exam_type
▶	1	Nusrat	Jahan	A	3.8	Excellent	Final
	2	Rafi	Hasan	A-	3.5	Good	Mid
	3	Mitu	Akter	A-	3.6	Very Good	Final
	4	Sami	Rahman	A	3.9	Outstanding	Final
	5	Tanha	Khan	A-	3.7	Satisfactory	Mid
	6	Arif	Hossain	B+	3.2	Average	Mid
	7	Farzana	Noor	B	3	Improved	Final
	8	Imran	Ali	A	3.85	Excellent	Final
	9	Sadia	Rahim	A-	3.4	Good	Mid
	10	Naeem	Islam	A+	3.95	Top Score	Final

6. List all students with their enrolled courses and course teacher:

6. List all students with their enrolled courses and course teacher

```
SELECT S.F_name AS Student, C.Course_title, T.F_name AS Teacher
FROM Enrolls E
JOIN Student S ON E.Student_id = S.Student_id
JOIN Course C ON E.Course_id = C.Course_id
JOIN Teacher T ON C.Teacher_id = T.Teacher_id;
```

Output:

	Student	Course_title	Teacher
▶	Nusrat	Database Systems	Shamim
	Rafi	Digital Logic	Fahim
	Mitu	Data Structures	Joya
	Sami	Accounting	Sumon
	Tanha	Electronics	Afsana
	Arif	Fundamentals	Mahfuz
	Farzana	Web Development	Farid
	Imran	Networking	Tahmid
	Sadia	Microprocessor	Mira
	Naeem	Machine Learning	Rashid

7.Find total number of students in each department:

```
7. Find total number of students in each department
SELECT Department, COUNT(*) AS Total_Students
FROM Student
GROUP BY Department;
```

Output:

	Department	Total_Students
▶	CSE	5
	EEE	3
	BBA	2

8.Find the highest CGPA and corresponding student name:

```
8. Find the highest CGPA and corresponding student name
SELECT S.F_name, S.L_name, R.cgpa
FROM Student S
JOIN Result R ON S.Student_id = R.Student_id
WHERE R.cgpa = (SELECT MAX(CGPA) FROM Result);
```

Output:

	F_name	L_name	cgpa
▶	Naeem	Islam	3.95

9. Show list of teachers from CSE department with their email:

9. Show list of teachers from CSE department with their email

```
SELECT T.F_name, T.L_name, TE.Teacher_Email  
FROM Teacher T  
JOIN Teacher_Email TE ON T.Teacher_id = TE.Teacher_id  
WHERE T.Department = 'CSE';
```

Output:

	F_name	L_name	Teacher_Email
▶	Shamim	Ahmed	shamim@univ.com
	Fahim	Shamim	fahim@univ.com
	Mahfuz	Alam	mahfuz@univ.com
	Farid	Uddin	farid@univ.com
	Tahmid	Hasan	tahmid@univ.com
	Rashid	Hossain	rashid@univ.com

10. Calculate average CGPA per department:

10. Calculate average CGPA per department

```
SELECT S.Department, ROUND(AVG(R.cgpa), 2) AS Avg_CGPA  
FROM Result R  
JOIN Student S ON R.Student_id = S.Student_id  
GROUP BY S.Department;
```

Output:

	Department	Avg_CGPA
▶	CSE	3.61
	EEE	3.58
	BBA	3.55

Outcome

- ❖ Error minimization and faster result processing.
- ❖ Improved data security and accuracy.
- ❖ Enhanced user accessibility via different result viewing formats.
- ❖ Reduced administrative workload and paper consumption.

Discussion

The Student Result Management System helps automate result processing and reduce human errors. It ensures accurate data handling and easy access for both teachers and students. By using a well-structured database with proper relationships, the system maintains data consistency and improves overall efficiency in managing academic results.

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Git Hub Links

<https://github.com/tamim65k>

<https://github.com/Montasirpeal>

<https://github.com/paransha1>

<https://github.com/nusrattasfi>