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Description for all the project

Description of Tables for School Management System

1. Teacher Table

Attribute	Explanation
teacher_id	Unique identifier for each teacher (Primary Key).
email	Unique email address of the teacher (cannot be null).
password	Password for teacher login.
fname	First name of the teacher.
lname	Last name of the teacher
dob	Date of birth of the teacher.
phone	Landline phone number of the teacher.
mobile	Unique mobile phone number of the teacher.
status	Active status of the teacher (0 for inactive, 1 for active).
last_login_date	Date of the last login by the teacher.
last_login_ip	IP address of the last login.

2. Grade Table

Attribute	Explanation
grade_id	Unique identifier for each grade (Primary Key).
name	Name of the grade (e.g., "Grade 1", "Grade 2").
grade_description	Description or remarks about the grade.

3. Classroom Table

Attribute	Explanation
classroom_id	Unique identifier for each classroom (Primary Key).
year	The academic year for the classroom.
grade_id	References the grade table to associate the classroom with a grade.
section	Section identifier for the classroom.
status	Status of the classroom (0 for inactive, 1 for active).
remarks	Any additional notes or comments about the classroom.
teacher_id	References the teacher table to associate a teacher with the classroom.

4. Parent Table

Attribute	Explanation
parent_id	Unique identifier for each parent (Primary Key).
email	Unique email address of the parent.
password	Password for parent login.
fname	First name of the parent.
lname	Last name of the parent (optional).
dob	Date of birth of the parent.
phone	Landline phone number of the parent.
mobile	Unique mobile phone number of the parent.
status	Status of the parent (0 for inactive, 1 for active).
last_login_date	Date of the last login by the parent.
last_login_ip	IP address of the last login.

5. Student Table

Attribute	Explanation
student_id	Unique identifier for each student (Primary Key).
email	Unique email address of the student.
password	Password for student login.
fname	First name of the student.
lname	Last name of the student (optional).
dob	Date of birth of the student.
phone	Landline phone number of the student.
mobile	Mobile phone number of the student.
parent_id	References the parent table to associate a parent with the student.
date_of_join	Date when the student joined.
status	Status of the student (0 for inactive, 1 for active).
last_login_date	Date of the last login by the student.
last_login_ip	IP address of the last login.

6. Classroom-Student Table

Attribute	Explanation
classroom_id	References the classroom table to associate students with classrooms.
student_id	References the student table to associate a student with a classroom.

7. Attendance Table

Attribute	Explanation
date_of_attendance	Date of the attendance record.
student_id	References the student table to indicate which student the record belongs to.
status	Attendance status (1 for present, 0 for absent).
remark	Additional comments or remarks about the attendance.

8. Exam Type Table

Attribute	Explanation
exam_type_id	Unique identifier for the type of exam (Primary Key).
name	Name of the exam type.
description_exam	Description or remarks about the exam type.

9. Exam Table

Attribute	Explanation
exam_id	Unique identifier for the exam (Primary Key).
exam_type_id	References the exam_type table to associate the exam with a type.
name	Name of the exam.
start_date	Date when the exam is scheduled to start.

10. Course Table

Attribute	Explanation
course_id	Unique identifier for the course (Primary Key).
name	Name of the course.
description	Description of the course.
grade_id	References the grade table to associate the course with a grade.

11. Exam Result Table

Attribute	Explanation
exam_id	References the exam table to identify which exam the result belongs to.
student_id	References the student table to associate the result with a student.
course_id	References the course table to identify the course.
marks	Marks obtained by the student for the exam.

SQL Queries and Descriptions

Query 1: Retrieve a list of all students in a specific classroom along with their grade

Description: This query retrieves a list of students enrolled in a specific classroom, including their full name, grade, and grade description. The results are ordered by classroom ID and the students' last names.

Query:

```
SELECT
  c.classroom_id AS classroom_id,
  s.fname || ' ' || s.lname AS student_name,
  g.name AS grade_name,
  g.grade_description AS grade_desc
FROM
   student s
JOIN
    classroom_student cs ON s.student_id = cs.student_id
JOIN
    classroom c ON cs.classroom_id = c.classroom_id
JOIN
    grade g ON c.grade_id = g.grade_id
ORDER BY c.classroom_id, s.lname;
```

Query 2: Fetch the details of all teachers teaching a specific course

Description: This query fetches teacher information (ID, name, email, and phone) for teachers associated with a specific course. It uses a filter on `course_id` to ensure results pertain to the specified course.

Query:

```
SELECT t.teacher_id, t.fname || ' ' || t.lname AS teacher_name, t.email,
t.phone
FROM teacher t
JOIN classroom c ON t.teacher_id = c.teacher_id
JOIN course cr ON c.grade_id = cr.grade_id
WHERE cr.course_id = 4;
```

Query 3: Find all exams taken by a student along with their marks

Description: This query retrieves the list of exams, exam types, and the marks obtained by a specific student. It filters results based on the student's ID.

Query:

```
SELECT e.name AS exam_name, et.name AS exam_type, er.marks
FROM exam_result er
JOIN exam e ON er.exam_id = e.exam_id
JOIN exam_type et ON e.exam_type_id = et.exam_type_id
WHERE er.student_id = 3;
```

Query 4: Retrieve the attendance records for a specific student within a given date range

Description: This query fetches attendance records (date, status, and remarks) for a specific student, filtered within a defined date range. The results are ordered by attendance date.

Query:

```
SELECT
  A.date_of_attendance,
  A.status,
  A.remark
FROM
  attendance  A
WHERE
  A.student_id = 6
  AND A.date_of_attendance BETWEEN TO_DATE('2024-01-01', 'YYYY-MM-DD') AND
TO_DATE('2024-01-31', 'YYYY-MM-DD')
ORDER BY
  A.date_of_attendance;
```

Query 5: List the parents' contact information for all students in a particular grade

Description: This query retrieves the names, phone numbers, mobile numbers, and email addresses of parents whose children are enrolled in a specific grade.

Query:

```
SELECT p.fname || ' ' || p.lname AS parent_name, p.phone, p.mobile, p.email
FROM parent p
JOIN student s ON p.parent_id = s.parent_id
JOIN classroom_student cs ON s.student_id = cs.student_id
JOIN classroom c ON cs.classroom_id = c.classroom_id
JOIN grade g ON c.grade_id = g.grade_id
WHERE g.grade_id = 1;
```

Query 6: Fetch the average marks for each exam type for a specific course

Description: This query calculates the average marks for each exam type within a specific course. It uses grouping by exam type to calculate the averages.

Query:

```
SELECT et.name AS exam_type, AVG(TO_NUMBER(er.marks)) AS average_marks
FROM exam_result er
JOIN exam e ON er.exam_id = e.exam_id
JOIN exam_type et ON e.exam_type_id = et.exam_type_id
WHERE er.course_id = 1
GROUP BY et.name;
```

Query 7: Display all courses along with their associated grade and teacher

Description: This query lists all courses, the grades they belong to, and the teachers associated with those grades.

Query:

```
SELECT cr.name AS course_name, g.name AS grade_name, t.fname || ' ' ||
t.lname AS teacher_name
FROM course cr
JOIN grade g ON cr.grade_id = g.grade_id
JOIN classroom c ON g.grade_id = c.grade_id
JOIN teacher t ON c.teacher_id = t.teacher_id;
```

Query 8: List all classrooms along with the number of students in each

Description: This query provides a list of classrooms, including the year, section, and the number of students enrolled in each classroom. It uses a `LEFT JOIN` to include classrooms with no students.

Query:

```
SELECT c.classroom_id, c.year, c.section, COUNT(cs.student_id) AS
student_count
FROM classroom c
LEFT JOIN classroom_student cs ON c.classroom_id = cs.classroom_id
GROUP BY c.classroom_id, c.year, c.section
ORDER BY c.classroom_id;
```

Views

View 1: Report of Average Marks by Classroom

Description: This view calculates and stores the average marks for each classroom, grouped by classroom ID, year, and section.

Query:

```
CREATE OR REPLACE VIEW report1 AS
SELECT
  c.classroom_id,
  c.year,
  c.section,
  AVG(TO_NUMBER(er.marks)) AS average_marks
FROM
  classroom c
JOIN classroom_student cs ON c.classroom_id = cs.classroom_id
JOIN exam_result er ON cs.student_id = er.student_id
GROUP BY
  c.classroom_id, c.year, c.section
ORDER BY
  c.classroom_id;
```

Usage:

```
desc report1;
SELECT * FROM report1;
```

View 2: Report of Teachers and Courses by Grade

Description: This view stores details about teachers, the courses they teach, and the associated grades.

Query:

```
CREATE OR REPLACE VIEW report2 AS
SELECT
  t.teacher_id,
  t.fname || ' ' || t.lname AS teacher_name,
  cr.course_id,
  cr.name AS course_name,
  g.grade_id,
  g.name AS grade_name
FROM
  teacher t
JOIN classroom c ON t.teacher_id = c.teacher_id
JOIN grade g ON c.grade_id = g.grade_id
JOIN course cr ON g.grade_id = cr.grade_id
ORDER BY
  t.teacher_id, cr.course_id;
```

Usage:

```
desc report2;
SELECT * FROM report2;
```