STUDENT STUDY MATERIALS

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Abstract :

This project aims to develop a database system for managing student study materials within an educational setting. The database schema includes tables for classes, students, study materials, and the association between students and materials. Through queries, subqueries, and joins, the system facilitates tasks such as class enrollment tracking, study material access, and class statistics generation. By structuring data in this manner, the project enhances educational resource management and supports efficient learning experiences for students.

Students study materials

PROJECT FOR SQL MODULE

1.Description

"Explore a curated collection of study materials designed to enhance your understanding of abstract concepts. From abstract art to mathematics, critical thinking to scientific theories, these resources provide clear explanations, examples, and exercises to help you grasp complex ideas. Dive into textbooks, articles, guides, and analyses tailored to various subjects, empowering you to excel in your academic pursuits and develop a deeper appreciation for abstract thinking."

- This database contain 4 tables.

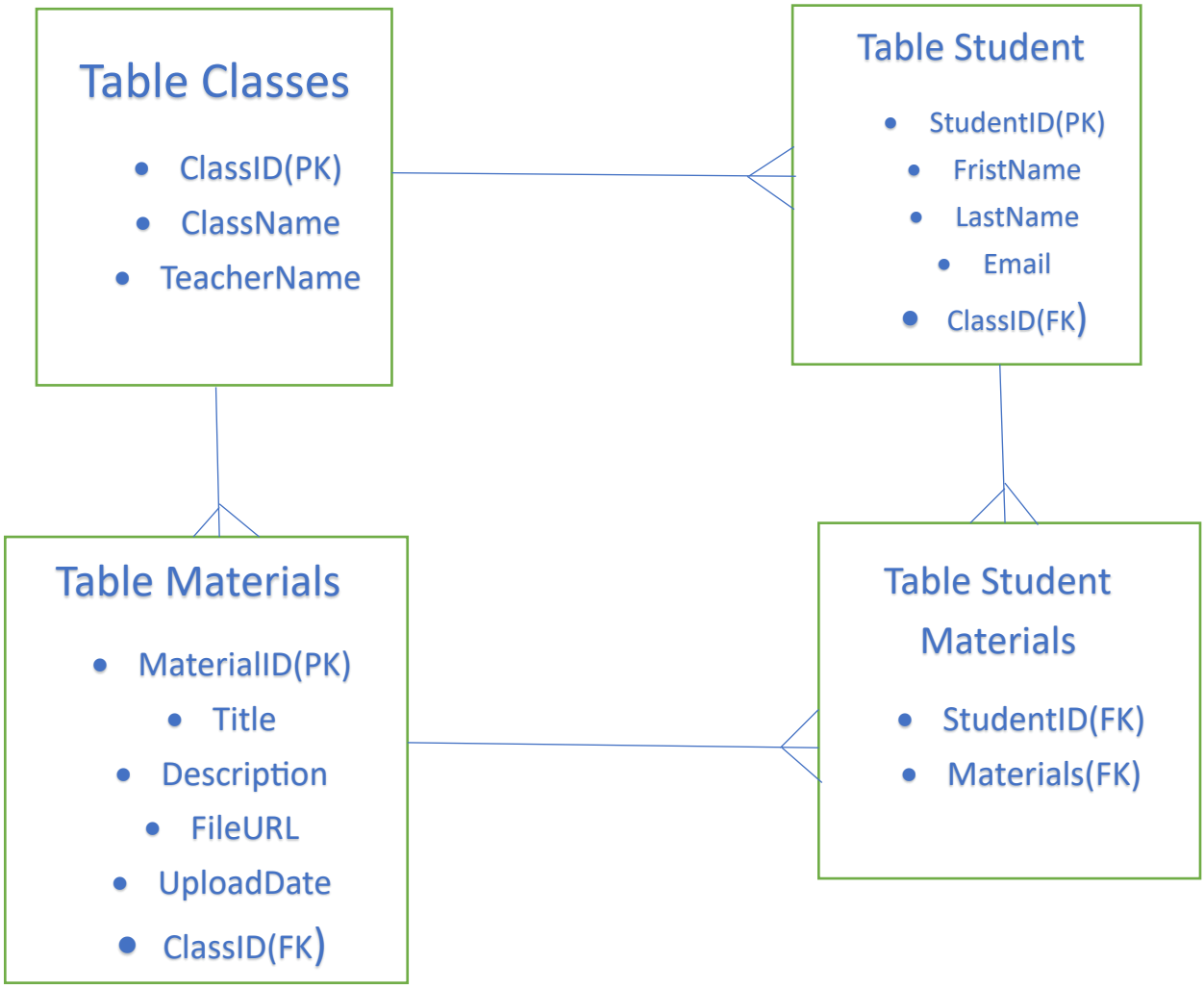
1.Students

2.Classes

3.Materials

4.StudentMaterials

2.ER.DIAGRAM(Entity Relation-Diagram) For STUDENTS STUDY MATERIALS



3. Table Descriptions:

1.Students:

```
42 •    DESC STUDENTS;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
StudentID	int	NO	PRI	NULL	
FirstName	varchar(50)	YES		NULL	
LastName	varchar(50)	YES		NULL	
Email	varchar(100)	YES		NULL	
ClassID	int	YES	MUL	NULL	

2.Classes:

```
43 •    DESC CLASSES;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
ClassID	int	NO	PRI	NULL	
ClassName	varchar(100)	YES		NULL	
TeacherName	varchar(100)	YES		NULL	

3.Materials:

```
44 •    DESC MATERIALS;
45
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
MaterialID	int	NO	PRI	NULL	
Title	varchar(100)	YES		NULL	
Description	text	YES		NULL	
FileURL	varchar(255)	YES		NULL	
UploadDate	date	YES		NULL	
ClassID	int	YES	MUL	NULL	

4.Student Materials:

```
45 •    DESC STUDENTMATERIALS;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
ClassID	int	NO	PRI	NULL	
ClassName	varchar(100)	YES		NULL	
TeacherName	varchar(100)	YES		NULL	

4.COMMANDS:

Create database ssm:

Use ssm:

```
-- Table: Classes
CREATE TABLE Classes (
    ClassID INT PRIMARY KEY,
    ClassName VARCHAR(100),
    TeacherName VARCHAR(100)
);
-- Table: Students
CREATE TABLE Students (
    StudentID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    Email VARCHAR(100),
    ClassID INT,
    FOREIGN KEY (ClassID) REFERENCES Classes(ClassID)
);
```

```
CREATE TABLE Materials (
    MaterialID INT PRIMARY KEY,
    Title VARCHAR(100),
    Description TEXT,
    FileURL VARCHAR(255),
    UploadDate DATE,
    ClassID INT,
    FOREIGN KEY (ClassID) REFERENCES Classes(ClassID)
);

-- Table: StudentMaterials (Associative table)
CREATE TABLE StudentMaterials (
    StudentID INT,
    MaterialID INT,
    FOREIGN KEY (StudentID) REFERENCES Students(StudentID),
    FOREIGN KEY (MaterialID) REFERENCES Materials(MaterialID),
    PRIMARY KEY (StudentID, MaterialID)
);
```

TABLE CLASSES:

```
-- Inserting values into the Classes table
INSERT INTO Classes (ClassID, ClassName, TeacherName)
VALUES
    (1, 'Mathematics', 'Mr. Smith'),
    (2, 'Science', 'Ms. Johnson'),
    (3, 'History', 'Mrs. Brown'),
    (4, 'English', 'Mr. Davis'),
    (5, 'Computer Science', 'Dr. Wilson'),
    (6, 'Art', 'Ms. Taylor'),
    (7, 'Physical Education', 'Coach Anderson'),
    (8, 'Music', 'Ms. Martinez'),
    (9, 'Geography', 'Mr. Thomas'),
    (10, 'Chemistry', 'Dr. Hernandez'),
    (11, 'Biology', 'Ms. Moore'),
    (12, 'Physics', 'Mr. Garcia'),
    (13, 'Literature', 'Mrs. Lee'),
    (14, 'Economics', 'Mr. Perez'),
    (15, 'Psychology', 'Dr. Lopez'),
    (16, 'Sociology', 'Ms. Scott'),
    (17, 'Philosophy', 'Mr. Adams'),
    (18, 'Political Science', 'Dr. Rivera'),
    (19, 'Foreign Language', 'Ms. Gonzalez'),
    (20, 'Engineering', 'Dr. Hill'),
    (21, 'Architecture', 'Mr. Ramirez'),
    (22, 'Business', 'Ms. Torres'),
    (23, 'Law', 'Mr. Nguyen'),
    (24, 'Medicine', 'Dr. King'),
```

```
    (25, 'Dentistry', 'Dr. Roberts');
```

TABLE STUDENTS :

```
-- Inserting values into the Students table
INSERT INTO Students (StudentID, FirstName, LastName, Email, ClassID)
VALUES
    (1, 'John', 'Doe', 'john.doe@example.com', 1),
    (2, 'Jane', 'Smith', 'jane.smith@example.com', 1),
    (3, 'Michael', 'Johnson', 'michael.johnson@example.com', 2),
    (4, 'Emily', 'Brown', 'emily.brown@example.com', 2),
    (5, 'William', 'Wilson', 'william.wilson@example.com', 1),
    (6, 'Sophia', 'Taylor', 'sophia.taylor@example.com', 3),
    (7, 'James', 'Anderson', 'james.anderson@example.com', 3),
    (8, 'Olivia', 'Martinez', 'olivia.martinez@example.com', 3),
    (9, 'Benjamin', 'Thomas', 'benjamin.thomas@example.com', 2),
    (10, 'Ava', 'Hernandez', 'ava.hernandez@example.com', 1),
    (11, 'Ethan', 'Moore', 'ethan.moore@example.com', 2),
    (12, 'Emma', 'Garcia', 'emma.garcia@example.com', 1),
    (13, 'Mia', 'Lee', 'mia.lee@example.com', 3),
    (14, 'Noah', 'Perez', 'noah.perez@example.com', 2),
    (15, 'Isabella', 'Lopez', 'isabella.lopez@example.com', 1),
    (16, 'Liam', 'Scott', 'liam.scott@example.com', 1),
    (17, 'Mason', 'Adams', 'mason.adams@example.com', 2),
    (18, 'Charlotte', 'Rivera', 'charlotte.rivera@example.com', 3),
    (19, 'Amelia', 'Gonzalez', 'amelia.gonzalez@example.com', 2),
    (20, 'Harper', 'Hill', 'harper.hill@example.com', 3),
    (21, 'Evelyn', 'Ramirez', 'evelyn.ramirez@example.com', 1),
```

(22, 'Alexander', 'Torres', 'alexander.torres@example.com', 3),

(23, 'Abigail', 'Nguyen', 'abigail.nguyen@example.com', 1),

(24, 'Elijah', 'King', 'elijah.king@example.com', 2),

(25, 'Lily', 'Roberts', 'lily.roberts@example.com', 3);

TABLE MATERIALS:

-- Inserting values into the Materials table

INSERT INTO Materials (MaterialID, Title, Description, FileURL, UploadDate, ClassID)

VALUES

(1, 'Introduction to Algebra', 'Basic concepts and operations in algebra.', 'http://example.com/algebra.pdf', '2024-05-01', 1),

(2, 'Chemical Reactions', 'Explanation of chemical reactions and their types.', 'http://example.com/chemical_reactions.pdf', '2024-05-02', 2),

(3, 'World War II Timeline', 'Timeline of major events during World War II.', 'http://example.com/wwii_timeline.pdf', '2024-05-03', 3),

(4, 'Shakespearean Sonnets', 'Collection of Shakespearean sonnets with analysis.', 'http://example.com/shakespeare_sonnets.pdf', '2024-05-04', 4),

(5, 'Introduction to Programming', 'Basics of programming logic and syntax.', 'http://example.com/programming_intro.pdf', '2024-05-05', 5),

(6, 'Art History: Renaissance', 'Overview of art movements during the Renaissance period.', 'http://example.com/renaissance_art.pdf', '2024-05-06', 6),

(7, 'Physical Fitness Guide', 'Guide to improve physical fitness with exercises and diet tips.', 'http://example.com/fitness_guide.pdf', '2024-05-07', 7),

(8, 'Music Theory Basics', 'Fundamental concepts of music theory.', 'http://example.com/music_theory.pdf', '2024-05-08', 8),

(9, 'Geographical Landforms', 'Description and examples of various geographical landforms.', 'http://example.com/geographical_landforms.pdf', '2024-05-09', 9),

(10, 'Chemical Equations', 'Explanation of balancing chemical equations.', 'http://example.com/chemical_equations.pdf', '2024-05-10', 10),

(11, 'Biology Basics', 'Introduction to the fundamentals of biology.', 'http://example.com/biology_basics.pdf', '2024-05-11', 11),

(12, 'Physics Formulas', 'Commonly used physics formulas and equations.', 'http://example.com/physics_formulas.pdf', '2024-05-12', 12),

(13, 'Literary Analysis Guide', 'Guide to analyzing literature with examples.', 'http://example.com/literary_analysis_guide.pdf', '2024-05-13', 13),

(14, 'Economic Principles', 'Basic economic principles and concepts.', 'http://example.com/economic_principles.pdf', '2024-05-14', 14),

(15, 'Psychological Theories', 'Overview of major psychological theories.', 'http://example.com/psychological_theories.pdf', '2024-05-15', 15),

(16, 'Sociology: Introduction', 'Introduction to the field of sociology.', 'http://example.com/sociology_intro.pdf', '2024-05-16', 16),

(17, 'Philosophy: Ethics', 'Exploration of ethical theories in philosophy.', 'http://example.com/philosophy_ethics.pdf', '2024-05-17', 17),

(18, 'Political Systems', 'Overview of political systems and governance.', 'http://example.com/political_systems.pdf', '2024-05-18', 18),

(19, 'Spanish Language Basics', 'Basic vocabulary and grammar in Spanish.', 'http://example.com/spanish_basics.pdf', '2024-05-19', 19),

(20, 'Engineering Principles', 'Fundamental principles of engineering.', 'http://example.com/engineering_principles.pdf', '2024-05-20', 20),

(21, 'Architectural Design Fundamentals', 'Introduction to architectural design concepts.', 'http://example.com/architectural_design.pdf', '2024-05-21', 21),

(22, 'Business Management Techniques', 'Techniques and strategies in business management.', 'http://example.com/business_management.pdf', '2024-05-22', 22),

(23, 'Introduction to Law', 'Basic concepts and principles of law.', 'http://example.com/law_intro.pdf', '2024-05-23', 23),

(24, 'Medical Terminology', 'Basic medical terminology and vocabulary.', 'http://example.com/medical_terminology.pdf', '2024-05-24', 24),

(25, 'Dental Anatomy', 'Study of human dental anatomy.', 'http://example.com/dental_anatomy.pdf', '2024-05-25', 25);

TABLE Student Materials:

```
-- Inserting values into the Student Materials table
INSERT INTO Student Materials (StudentID , MaterialID)
VALUES
    (1, 1),
    (1, 5),
    (2, 2),
    (3, 3),
    (3, 6),
    (4, 4),
    (5, 1),
    (6, 7),
    (7, 8),
    (8, 9),
    (9, 10),
    (10, 11),
    (11, 12),
    (12, 13),
    (13, 14),
    (14, 15),
    (15, 16),
    (16, 17),
    (17, 18),
    (18, 19),
    (19, 20),
    (20, 21),
    (21, 22),
    (22, 23),
```

(23, 24),

(24, 25);

Queries:

1. Retrieve the first and last names of all students.

SELECT FirstName, LastName FROM Students;

FirstName	LastName
John	Doe
Jane	Smith
Michael	Johnson
Emily	Brown
William	Wilson
Sophia	Taylor
James	Anderson
Olivia	Martinez
Benjamin	Thomas
Ava	Hernandez
Ethan	Moore
Emma	Garcia
Mia	Lee
Noah	Perez
Isabella	Lopez
Liam	Scott
Mason	Adams
Charlotte	Rivera
Amelia	Gonzalez
Harper	Hill
Evelyn	Ramirez
Alexander	Torres
Abigail	Nguyen
Elijah	King
Lily	Roberts

2. Count the number of students in each class.

```
SELECT ClassID, COUNT(*) AS NumberOfStudents FROM Students GROUP BY ClassID;
```

ClassID	NumberOfStudents
1	9
2	8
3	8

3. Find the title and description of study materials uploaded after May 1, 2024.

```
SELECT Title, Description FROM Materials WHERE UploadDate > '2024-05-01';
```

title	description
Chemical Reactions	Explanation of chemical reactions and their types.
World War II Timeline	Timeline of major events during World War II.
Shakespearean Sonnets	Collection of Shakespearean sonnets with analy...
Introduction to Programming	Basics of programming logic and syntax.
Art History: Renaissance	Overview of art movements during the Renaiss...
Physical Fitness Guide	Guide to improve physical fitness with exercises...
Music Theory Basics	Fundamental concepts of music theory.
Geographical Landforms	Description and examples of various geographic...
Chemical Equations	Explanation of balancing chemical equations.
Biology Basics	Introduction to the fundamentals of biology.
Physics Formulas	Commonly used physics formulas and equations.
Literary Analysis Guide	Guide to analyzing literature with examples.
Economic Principles	Basic economic principles and concepts.
Psychological Theories	Overview of major psychological theories.
Sociology: Introduction	Introduction to the field of sociology.

	Philosophy: Ethics	Exploration of ethical theories in philosophy.
	Political Systems	Overview of political systems and governance.
	Spanish Language Basics	Basic vocabulary and grammar in Spanish.
	Engineering Principles	Fundamental principles of engineering.
	Architectural Design Funda...	Introduction to architectural design concepts.
	Business Management Tech...	Techniques and strategies in business managem...
	Introduction to Law	Basic concepts and principles of law.
	Medical Terminology	Basic medical terminology and vocabulary.
	Dental Anatomy	Study of human dental anatomy.

4. Retrieve the email addresses of students in the "Science" class.

SELECT Email FROM Students WHERE ClassID = (SELECT ClassID FROM Classes WHERE ClassName = 'Science');

	email
▶	michael.johnson@example.com
	emily.brown@example.com
	benjamin.thomas@example.com
	ethan.moore@example.com
	noah.perez@example.com
	mason.adams@example.com
	amelia.gonzalez@example.com
	elijah.king@example.com

Subqueries:*

1. Find the title of study materials uploaded by students with the last name "Smith."

SELECT Title FROM Materials WHERE MaterialID IN (SELECT MaterialID FROM StudentMaterials WHERE StudentID IN (SELECT StudentID FROM Students WHERE LastName = 'Smith'));

	Title
▶	Chemical Reactions

2. Retrieve the email addresses of students enrolled in classes taught by "Dr. Hernandez."

SELECT Email FROM Students WHERE ClassID IN (SELECT ClassID FROM Classes WHERE FirstName ='John');

	Email
▶	john.doe@example.com

3. Find the names of students enrolled in the same class as "John Doe."

SELECT FirstName, LastName FROM Students WHERE ClassID = (SELECT ClassID FROM Students WHERE FirstName = 'John' AND LastName = 'Doe');

	FirstName	LastName
▶	John	Doe
	Jane	Smith
	William	Wilson
	Ava	Hernandez
	Emma	Garcia
	Isabella	Lopez
	Liam	Scott
	Evelyn	Ramirez
	Abigail	Nguyen

4. List the titles of study materials with descriptions containing the word "Basics."

SELECT Title FROM Materials WHERE Description LIKE '%Basics%';

	Title
▶	Introduction to Programming

5. Count the number of study materials uploaded by students with email addresses ending in ".com."

SELECT COUNT(*) FROM Materials WHERE MaterialID IN (SELECT MaterialID FROM StudentMaterials WHERE StudentID IN (SELECT StudentID FROM Students WHERE Email LIKE '%.com'));

	COUNT(*)
▶	25

JOINS

1. List the class names along with the number of students enrolled, sorted by the number of students in descending order.

sql

```
SELECT c.ClassName, COUNT(s.StudentID) AS NumberOfStudents
FROM Classes c
LEFT JOIN Students s ON c.ClassID = s.ClassID
GROUP BY c.ClassID, c.ClassName
ORDER BY NumberOfStudents DESC;
```

ClassName	NumberOfStudents
Mathematics	9
Science	8
History	8
English	0
Computer Science	0
Art	0
Physical Education	0
Music	0
Geography	0
Chemistry	0
Biology	0
Physics	0
Literature	0
Economics	0
Psychology	0
Sociology	0
Philosophy	0
Political Science	0
Foreign Language	0
Engineering	0
Architecture	0
Business	0
Law	0
Medicine	0
Dentistry	0

2. Retrieve the first and last names of students along with the name of the class they are enrolled in.

```
SELECT s.FirstName, s.LastName, c.ClassName
FROM Students s
INNER JOIN Classes c ON s.ClassID = c.ClassID;
```

FirstName	LastName	ClassName
John	Doe	Mathematics
Jane	Smith	Mathematics
Michael	Johnson	Science
Emily	Brown	Science
William	Wilson	Mathematics
Sophia	Taylor	History
James	Anderson	History
Olivia	Martinez	History
Benjamin	Thomas	Science
Ava	Hernandez	Mathematics
Ethan	Moore	Science
Emma	Garcia	Mathematics
Mia	Lee	History
Noah	Perez	Science
Isabella	Lopez	Mathematics
Liam	Scott	Mathematics
Mason	Adams	Science
Charlotte	Rivera	History
Amelia	Gonzalez	Science
Harper	Hill	History
Evelyn	Ramirez	Mathematics
Alexander	Torres	History
Abigail	Nguyen	Mathematics
Elijah	King	Science
Lily	Roberts	History

3. Find the titles of study materials along with the names of the classes they belong to.

```
SELECT m.Title, c.ClassName
FROM Materials m
INNER JOIN Classes c ON m.ClassID = c.ClassID;
```

Title	ClassName
Introduction to Algebra	Mathematics
Chemical Reactions	Science
World War II Timeline	History
Shakespearean Sonnets	English
Introduction to Programming	Computer Science
Art History: Renaissance	Art
Physical Fitness Guide	Physical Education
Music Theory Basics	Music
Geographical Landforms	Geography
Chemical Equations	Chemistry
Biology Basics	Biology
Physics Formulas	Physics
Literary Analysis Guide	Literature
Economic Principles	Economics
Psychological Theories	Psychology
Sociology: Introduction	Sociology
Philosophy: Ethics	Philosophy
Political Systems	Political Science
Spanish Language Basics	Foreign Language
Engineering Principles	Engineering
Architectural Design Funda...	Architecture
Business Management Tech...	Business
Introduction to Law	Law
Medical Terminology	Medicine
Dental Anatomy	Dentistry

3. List the first and last names of students along with their email addresses and the name of the class they are enrolled in, sorted by class name.

```
SELECT s.FirstName, s.LastName, s.Email, c.ClassName
FROM Students s
INNER JOIN Classes c ON s.ClassID = c.ClassID
ORDER BY c.ClassName;
```

FirstName	LastName	Email	ClassName
Sophia	Taylor	sophia.taylor@example.com	History
James	Anderson	james.anderson@example.com	History
Olivia	Martinez	olivia.martinez@example.com	History
Mia	Lee	mia.lee@example.com	History
Charlotte	Rivera	charlotte.rivera@example.com	History
Harper	Hill	harper.hill@example.com	History
Alexander	Torres	alexander.torres@example.com	History
Lily	Roberts	lily.roberts@example.com	History
John	Doe	john.doe@example.com	Mathematics
Jane	Smith	jane.smith@example.com	Mathematics
William	Wilson	william.wilson@example.com	Mathematics
Ava	Hernandez	ava.hernandez@example.com	Mathematics
Emma	Garcia	emma.garcia@example.com	Mathematics
Isabella	Lopez	isabella.lopez@example.com	Mathematics
Liam	Scott	liam.scott@example.com	Mathematics
Evelyn	Ramirez	evelyn.ramirez@example.com	Mathematics
Abigail	Nguyen	abigail.nguyen@example.com	Mathematics
Michael	Johnson	michael.johnson@example.com	Science
Emily	Brown	emily.brown@example.com	Science
Benjamin	Thomas	benjamin.thomas@example.com	Science
Ethan	Moore	ethan.moore@example.com	Science
Noah	Perez	noah.perez@example.com	Science
Mason	Adams	mason.adams@example.com	Science
Amelia	Gonzalez	amelia.gonzalez@example.com	Science
Elijah	King	elijah.king@example.com	Science

5. Count the number of study materials uploaded for each class.

sql

```
SELECT c.ClassName, COUNT(m.MaterialID) AS NumberOfMaterials
FROM Classes c
LEFT JOIN Materials m ON c.ClassID = m.ClassID
GROUP BY c.ClassID, c.ClassName;
```

ClassName	NumberOfMaterials
Mathematics	1
Science	1
History	1
English	1
Computer Science	1
Art	1
Physical Education	1
Music	1
Geography	1
Chemistry	1
Biology	1
Physics	1
Literature	1
Economics	1
Psychology	1
Sociology	1
Philosophy	1
Political Science	1
Foreign Language	1

Engineering	1
Architecture	1
Business	1
Law	1
Medicine	1
Dentistry	1

6. Retrieve the first and last names of students along with the titles of study materials they have access to.

```
sql

SELECT s.FirstName, s.LastName, m.Title

FROM Students s

INNER JOIN StudentMaterials sm ON s.StudentID = sm.StudentID

INNER JOIN Materials m ON sm.MaterialID = m.MaterialID;
```

FirstName	LastName	Title
John	Doe	Introduction to Algebra
William	Wilson	Introduction to Algebra
Jane	Smith	Chemical Reactions
Michael	Johnson	World War II Timeline
Emily	Brown	Shakespearean Sonnets
John	Doe	Introduction to Programming
Michael	Johnson	Art History: Renaissance
Sophia	Taylor	Physical Fitness Guide
James	Anderson	Music Theory Basics
Olivia	Martinez	Geographical Landforms
Benjamin	Thomas	Chemical Equations
Ava	Hernandez	Biology Basics
Ethan	Moore	Physics Formulas
Emma	Garcia	Literary Analysis Guide
Mia	Lee	Economic Principles
Noah	Perez	Psychological Theories
Isabella	Lopez	Sociology: Introduction
Liam	Scott	Philosophy: Ethics
Mason	Adams	Political Systems
Charlotte	Rivera	Spanish Language Basics
Amelia	Gonzalez	Engineering Principles
Harper	Hill	Architectural Design Funda...
Evelyn	Ramirez	Business Management Tech...
Alexander	Torres	Introduction to Law
Abigail	Nguyen	Medical Terminology
Elijah	King	Dental Anatomy

CONCLUTION

This project involves designing a database schema for managing student study materials. The schema includes tables for classes, students, study materials, and the association between students and materials.

Key features of the project include:

- *Classes:* Store information about different courses offered, including class name and teacher name.

- *Students:* Manage student details such as names, email addresses, and their enrollment in specific classes.

- *Materials:* Store study materials, including titles, descriptions, file URLs, upload dates, and the associated class.

- *StudentMaterials:* Establish a many-to-many relationship between students and study materials, allowing students to access multiple materials and materials to be accessed by multiple students.

Queries, subqueries, and joins are utilized to retrieve relevant information from the database, such as class enrollment, study material access, and class statistics.

Overall, this project provides a structured approach to organizing and accessing study materials for students across various classes, facilitating efficient learning management and resource utilization.