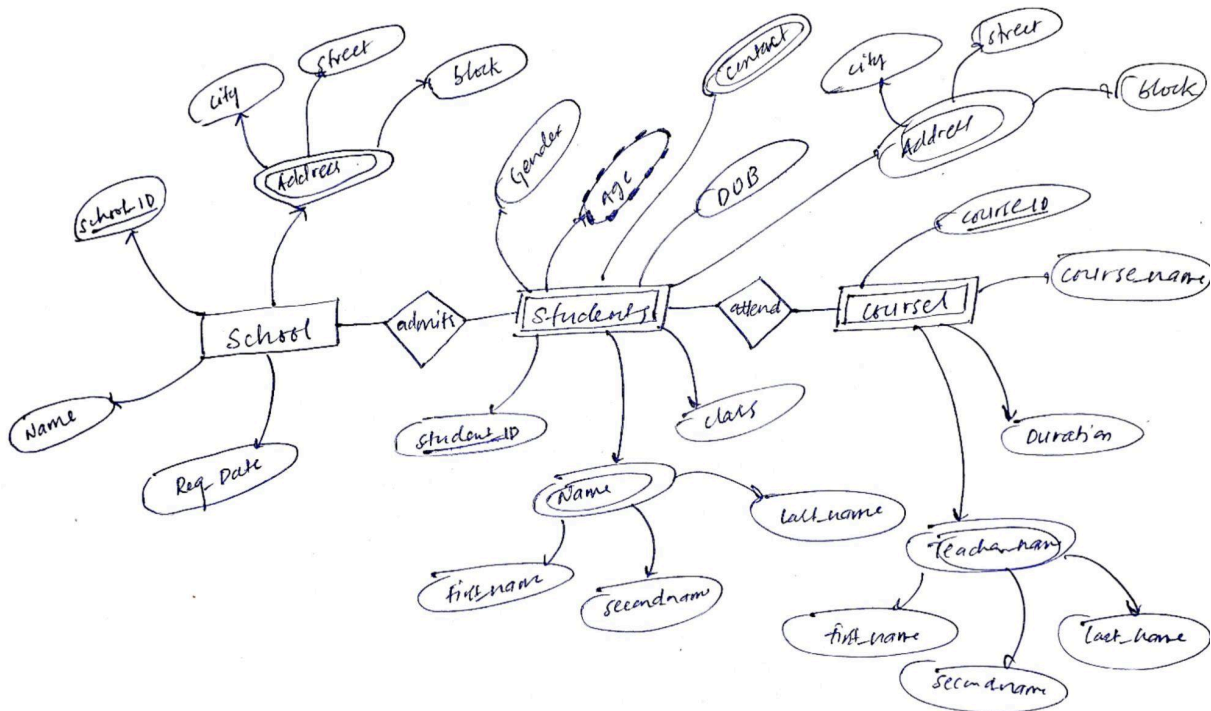


Indian Education System

In my DBMS project on the Indian Education System, I created three main tables: Educational_Institution, Students, and Courses. The Educational_Institution table includes important details like the name of the school, its address, the type of institution, and when it was registered. This table helps to organize information about different schools in India. In the Students table, I included records for students, which contain their ID, name, age, gender, class, and contact details. This table is linked to the Educational_Institution table through a foreign key called School_ID, showing which school each student belongs to.

Next, I created the Courses table to list the courses offered in different institutions. This table has details like the course name, duration, and teacher name. Throughout the project, I applied various SQL concepts, such as creating tables, inserting records, and using different types of joins to combine data from these tables. I also explored functions and commands like GROUP BY, ORDER BY, and set operations to manipulate and analyze the data. Overall, this project has helped me understand how to organize and manage information related to the education system in India.



DDL and DML Commands

```
CREATE TABLE School (  
    School_ID INT PRIMARY KEY,  
    Name VARCHAR(100) NOT NULL,  
    Address VARCHAR(255) NOT NULL,  
    Type VARCHAR(50) NOT NULL,  
    Registration_Date DATE NOT NULL  
);
```

DESC School;

Field	Type	Null	Key	Default	Extra
School_ID	int	NO	PRI	NULL	
Name	varchar(100)	NO		NULL	
Address	varchar(255)	NO		NULL	
Type	varchar(50)	NO		NULL	
Registration_Date	date	NO		NULL	

```
CREATE TABLE Students (  
    Student_ID INT PRIMARY KEY,  
    Name VARCHAR(100) NOT NULL,  
    Age INT CHECK (Age >= 5 AND Age <= 18),  
    Gender VARCHAR(10) NOT NULL,  
    Class VARCHAR(10) NOT NULL,  
    Address VARCHAR(255),  
    Phone_Number VARCHAR(15),  
    School_ID INT,  
    FOREIGN KEY (School_ID) REFERENCES School(School_ID)  
);
```

DESC Students;

Field	Type	Null	Key	Default	Extra
Student_ID	int	NO	PRI	NULL	
Name	varchar(100)	NO		NULL	
Age	int	YES		NULL	
Gender	varchar(10)	NO		NULL	
Class	varchar(10)	NO		NULL	
Address	varchar(255)	YES		NULL	
Phone_Number	varchar(15)	YES		NULL	
School_ID	int	YES	MUL	NULL	

```

CREATE TABLE Courses (
  Course_ID INT PRIMARY KEY,
  Course_Name VARCHAR(100) NOT NULL,
  Duration VARCHAR(50) NOT NULL,
  Teacher_Name VARCHAR(100) NOT NULL,
  Student_ID INT,
  FOREIGN KEY (Student_ID) REFERENCES Students(Student_ID)
);

```

DESC Courses;

Field	Type	Null	Key	Default	Extra
Course_ID	int	NO	PRI	NULL	
Course_Name	varchar(100)	NO		NULL	
Duration	varchar(50)	NO		NULL	
Teacher_Name	varchar(100)	NO		NULL	
Student_ID	int	YES	MUL	NULL	

```

INSERT INTO School (School_ID, Name, Address, Type, Registration_Date) VALUES
(1, 'St. Xavier's High School', 'Shivaji Nagar, Bangalore, Karnataka', 'Private', '2005-06-15'),
(2, 'Government Higher Secondary School', 'Connaught Place, New Delhi', 'Government', '1998-08-25'),
(3, 'D.A.V. Public School', 'Sector 14, Gurgaon, Haryana', 'Private', '2000-01-10'),
(4, 'Army Public School', 'Kumaraswamy Layout, Bangalore, Karnataka', 'Army', '2010-04-20'),
(5, 'Jawahar Navodaya Vidyalaya', 'Pune, Maharashtra', 'Government', '1986-03-30');

```

SELECT * FROM School;

School_ID	Name	Address	Type	Registration_Date
1	St. Xavier's High School	Shivaji Nagar, Bangalore, Karnataka	Private	2005-06-15
2	Government Higher Secondary School	Connaught Place, New Delhi	Government	1998-08-25
3	D.A.V. Public School	Sector 14, Gurgaon, Haryana	Private	2000-01-10
4	Army Public School	Kumaraswamy Layout, Bangalore, Karnataka	Army	2010-04-20
5	Jawahar Navodaya Vidyalaya	Pune, Maharashtra	Government	1986-03-30

```
INSERT INTO Students (Student_ID, Name, Age, Gender, Class, Address, Phone_Number, School_ID) VALUES
```

```
(1, 'Rahul Sharma', 15, 'Male', '10', '2nd Block, Koramangala, Bangalore', '9876543210', 1),
(2, 'Sneha Patel', 14, 'Female', '9', 'Sector 12, Dwarka, New Delhi', '9123456789', 2),
(3, 'Aarav Gupta', 13, 'Male', '8', 'Sector 14, Gurgaon', '9345678901', 3),
(4, 'Anaya Verma', 16, 'Female', '11', 'Ashoka Nagar, Bangalore', '8765432109', 4),
(5, 'Karan Singh', 12, 'Male', '7', 'Khadki, Pune', '9234567890', 5);
```

```
SELECT * FROM Students;
```

Student_ID	Name	Age	Gender	Class	Address	Phone_Number	School_ID
1	Rahul Sharma	15	Male	10	2nd Block, Koramangala, Bangalore	9876543210	1
2	Sneha Patel	14	Female	9	Sector 12, Dwarka, New Delhi	9123456789	2
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4
5	Karan Singh	12	Male	7	Khadki, Pune	9234567890	5

```
INSERT INTO Courses (Course_ID, Course_Name, Duration, Teacher_Name, Student_ID) VALUES
```

```
(1, 'Mathematics', '1 Year', 'Mr. Ravi Kumar', 1),
(2, 'Science', '1 Year', 'Ms. Anjali Desai', 2),
(3, 'English', '1 Year', 'Mr. Manoj Sharma', 3),
(4, 'History', '1 Year', 'Ms. Neeta Agarwal', 4),
(5, 'Geography', '1 Year', 'Mr. Ramesh Iyer', 5);
```

```
SELECT * FROM Courses;
```

Course_ID	Course_Name	Duration	Teacher_Name	Student_ID
1	Mathematics	1 Year	Mr. Ravi Kumar	1
2	Science	1 Year	Ms. Anjali Desai	2
3	English	1 Year	Mr. Manoj Sharma	3
4	History	1 Year	Ms. Neeta Agarwal	4
5	Geography	1 Year	Mr. Ramesh Iyer	5

```
ALTER TABLE School
```

```
ADD Principal_Name VARCHAR(50);
```

```
SELECT * FROM School;
```

School_ID	Name	Address	Type	Registration_Date	Principal_Name
1	St. Xavier's High School	Shivaji Nagar, Bangalore, Karnataka	Private	2005-06-15	NULL
2	Government Higher Secondary School	Connaught Place, New Delhi	Government	1998-08-25	NULL
3	D.A.V. Public School	Sector 14, Gurgaon, Haryana	Private	2000-01-10	NULL
4	Army Public School	Kumaraswamy Layout, Bangalore, Karnataka	Army	2010-04-20	NULL
5	Jawahar Navodaya Vidyalaya	Pune, Maharashtra	Government	1986-03-30	NULL

```
ALTER TABLE Students
MODIFY COLUMN Phone_Number VARCHAR(15);
```

```
ALTER TABLE Courses
DROP COLUMN Teacher_Name;
```

```
SELECT * FROM Courses;
```

Course_ID	Course_Name	Duration	Student_ID
1	Mathematics	1 Year	1
2	Science	1 Year	2
3	English	1 Year	3
4	History	1 Year	4
5	Geography	1 Year	5

```
RENAME TABLE School TO Educational_Institution;
```

```
SELECT * FROM Educational_Institution;
```

School_ID	Name	Address	Type	Registration_Date	Principal_Name
1	St. Xavier's High School	Shivaji Nagar, Bangalore, Karnataka	Private	2005-06-15	NULL
2	Government Higher Secondary School	Connaught Place, New Delhi	Government	1998-08-25	NULL
3	D.A.V. Public School	Sector 14, Gurgaon, Haryana	Private	2000-01-10	NULL
4	Army Public School	Kumaraswamy Layout, Bangalore, Karnataka	Army	2010-04-20	NULL
5	Jawahar Navodaya Vidyalaya	Pune, Maharashtra	Government	1986-03-30	NULL

```
UPDATE Educational_Institution
SET Principal_Name = 'Mr. Sharma'
WHERE School_ID = 1;
```

```
UPDATE Educational_Institution
SET Principal_Name = 'Mrs. Reddy'
WHERE School_ID = 2;
```

```
UPDATE Educational_Institution
SET Principal_Name = 'Dr. Joseph'
WHERE School_ID = 3;
```

```
UPDATE Educational_Institution
SET Principal_Name = 'Ms. D'Souza'
WHERE School_ID = 4;
```

```
UPDATE Educational_Institution
SET Principal_Name = 'Mr. Kumar'
WHERE School_ID = 5;
```

SELECT * FROM Educational_Institution;

School_ID	Name	Address	Type	Registration_Date	Principal_Name
1	St. Xavier's High School	Shivaji Nagar, Bangalore, Karnataka	Private	2005-06-15	Mr. Sharma
2	Government Higher Secondary School	Connaught Place, New Delhi	Government	1998-08-25	Mrs. Reddy
3	D.A.V. Public School	Sector 14, Gurgaon, Haryana	Private	2000-01-10	Dr. Joseph
4	Army Public School	Kumaraswamy Layout, Bangalore, Karnataka	Army	2010-04-20	Ms. D'Souza
5	Jawahar Navodaya Vidyalaya	Pune, Maharashtra	Government	1986-03-30	Mr. Kumar

JOINS

SELECT Students.Student_ID, Students.Name AS Student_Name,
Educational_Institution.Name AS Institution_Name
FROM Students
LEFT JOIN Educational_Institution
ON Students.School_ID = Educational_Institution.School_ID;

Student_ID	Student_Name	Institution_Name
1	Rahul Sharma	St. Xavier's High School
2	Sneha Patel	Government Higher Secondary School
3	Aarav Gupta	D.A.V. Public School
4	Anaya Verma	Army Public School
5	Karan Singh	Jawahar Navodaya Vidyalaya

SELECT Courses.Course_Name, Educational_Institution.Name AS Institution_Name
FROM Courses
RIGHT JOIN Educational_Institution
ON Courses.Student_ID IN (SELECT Student_ID FROM Students WHERE Students.School_ID
= Educational_Institution.School_ID);

Course_Name	Institution_Name
Mathematics	St. Xavier's High School
Science	Government Higher Secondary School
English	D.A.V. Public School
History	Army Public School
Geography	Jawahar Navodaya Vidyalaya

```

SELECT      Students.Name      AS      Student_Name,      Courses.Course_Name,
Educational_Institution.Name AS Institution_Name
FROM Students
INNER JOIN Courses
ON Students.Student_ID = Courses.Student_ID
INNER JOIN Educational_Institution
ON Students.School_ID = Educational_Institution.School_ID;

```

Student_Name	Course_Name	Institution_Name
Rahul Sharma	Mathematics	St. Xavier's High School
Sneha Patel	Science	Government Higher Secondary School
Aarav Gupta	English	D.A.V. Public School
Anaya Verma	History	Army Public School
Karan Singh	Geography	Jawahar Navodaya Vidyalaya

```

SELECT      Students.Name      AS      Student_Name,      Educational_Institution.Name      AS
Institution_Name
FROM Students
LEFT JOIN Educational_Institution
ON Students.School_ID = Educational_Institution.School_ID
UNION
SELECT      Students.Name      AS      Student_Name,      Educational_Institution.Name      AS
Institution_Name
FROM Students
RIGHT JOIN Educational_Institution
ON Students.School_ID = Educational_Institution.School_ID;

```

Student_Name	Institution_Name
Rahul Sharma	St. Xavier's High School
Sneha Patel	Government Higher Secondary School
Aarav Gupta	D.A.V. Public School
Anaya Verma	Army Public School
Karan Singh	Jawahar Navodaya Vidyalaya

```

SELECT
    Students.Student_ID,
    Students.Name AS Student_Name,
    Students.Age,
    Educational_Institution.Name AS Institution_Name,
    Courses.Course_Name,
    Courses.Duration
FROM
    Students
INNER JOIN
    Educational_Institution ON Students.School_ID = Educational_Institution.School_ID
INNER JOIN
    Courses ON Students.Student_ID = Courses.Student_ID;

```

Student_ID	Student_Name	Age	Institution_Name	Course_Name	Duration
1	Rahul Sharma	15	St. Xavier's High School	Mathematics	1 Year
2	Sneha Patel	14	Government Higher Secondary School	Science	1 Year
3	Aarav Gupta	13	D.A.V. Public School	English	1 Year
4	Anaya Verma	16	Army Public School	History	1 Year
5	Karan Singh	12	Jawahar Navodaya Vidyalaya	Geography	1 Year

SET OPERATION

```
SELECT Name FROM Students WHERE Age < 10
```

```
UNION
```

```
SELECT Name FROM Students WHERE Age >= 10;
```

Name
Rahul Sharma
Sneha Patel
Aarav Gupta
Anaya Verma
Karan Singh

ALGEBRA OPERATIONS

SELECT *

FROM Students

CROSS JOIN Courses;

Student_ID	Name	Age	Gender	Class	Address	Phone_Number	School_ID	Course_ID	Course_Name	Duration	Student_ID
5	Karan Singh	12	Male	7	Khadki, Pune	9234567890	5	1	Mathematics	1 Year	1
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4	1	Mathematics	1 Year	1
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3	1	Mathematics	1 Year	1
2	Sneha Patel	14	Female	9	Sector 12, Dwarka, New Delhi	9123456789	2	1	Mathematics	1 Year	1
1	Rahul Sharma	15	Male	10	2nd Block, Koramangala, Bangalore	9876543210	1	1	Mathematics	1 Year	1
5	Karan Singh	12	Male	7	Khadki, Pune	9234567890	5	2	Science	1 Year	2
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4	2	Science	1 Year	2
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3	2	Science	1 Year	2
2	Sneha Patel	14	Female	9	Sector 12, Dwarka, New Delhi	9123456789	2	2	Science	1 Year	2
1	Rahul Sharma	15	Male	10	2nd Block, Koramangala, Bangalore	9876543210	1	2	Science	1 Year	2
5	Karan Singh	12	Male	7	Khadki, Pune	9234567890	5	3	English	1 Year	3
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4	3	English	1 Year	3
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3	3	English	1 Year	3
2	Sneha Patel	14	Female	9	Sector 12, Dwarka, New Delhi	9123456789	2	3	English	1 Year	3
1	Rahul Sharma	15	Male	10	2nd Block, Koramangala, Bangalore	9876543210	1	3	English	1 Year	3
5	Karan Singh	12	Male	7	Khadki, Pune	9234567890	5	4	History	1 Year	4
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4	4	History	1 Year	4
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3	4	History	1 Year	4
2	Sneha Patel	14	Female	9	Sector 12, Dwarka, New Delhi	9123456789	2	4	History	1 Year	4
1	Rahul Sharma	15	Male	10	2nd Block, Koramangala, Bangalore	9876543210	1	4	History	1 Year	4
5	Karan Singh	12	Male	7	Khadki, Pune	9234567890	5	5	Geography	1 Year	5
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4	5	Geography	1 Year	5
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3	5	Geography	1 Year	5
2	Sneha Patel	14	Female	9	Sector 12, Dwarka, New Delhi	9123456789	2	5	Geography	1 Year	5
1	Rahul Sharma	15	Male	10	2nd Block, Koramangala, Bangalore	9876543210	1	5	Geography	1 Year	5

FUNCTIONS

SELECT *

FROM Students

WHERE Name LIKE 'A%';

Student_ID	Name	Age	Gender	Class	Address	Phone_Number	School_ID
3	Aarav Gupta	13	Male	8	Sector 14, Gurgaon	9345678901	3
4	Anaya Verma	16	Female	11	Ashoka Nagar, Bangalore	8765432109	4

SELECT *

FROM Courses

ORDER BY Duration ASC;

Course_ID	Course_Name	Duration	Student_ID
1	Mathematics	1 Year	1
2	Science	1 Year	2
3	English	1 Year	3
4	History	1 Year	4
5	Geography	1 Year	5

```
SELECT School_ID, COUNT(*) AS Number_of_Students
FROM Students
GROUP BY School_ID;
```

School_ID	Number_of_Students
1	1
2	1
3	1
4	1
5	1

```
SELECT Student_ID, UPPER(Name) AS Uppercase_Name
FROM Students;
```

Student_ID	Uppercase_Name
1	RAHUL SHARMA
2	SNEHA PATEL
3	AARAV GUPTA
4	ANAYA VERMA
5	KARAN SINGH

```
SELECT Course_ID, Course_Name, ROUND(Duration) AS Rounded_Duration
FROM Courses;
```

Course_ID	Course_Name	Rounded_Duration
1	Mathematics	1
2	Science	1
3	English	1
4	History	1
5	Geography	1

```
SELECT Name, DATEDIFF(CURDATE(), Registration_Date) AS Days_Since_Registration
FROM Educational_Institution;
```

Name	Days_Since_Registration
St. Xavier's High School	7063
Government Higher Secondary School	9549
D.A.V. Public School	9046
Army Public School	5293
Jawahar Navodaya Vidyalaya	14080

VIEW

```
CREATE VIEW Student_View AS
SELECT Student_ID, Name, Class
FROM Students;
```

```
DESC Student_View;
```

Field	Type	Null	Key	Default	Extra
Student_ID	int	NO		NULL	
Name	varchar(100)	NO		NULL	
Class	varchar(10)	NO		NULL	

```
UPDATE Student_View
SET Name = 'Anaya Sharma'
WHERE Student_ID = 1;
```

```
SELECT * FROM Student_View;
```

Student_ID	Name	Class
1	Anaya Sharma	10
2	Sneha Patel	9
3	Aarav Gupta	8
4	Anaya Verma	11
5	Karan Singh	7

QUERIES/NESTED QUERIES

```
SELECT Name
FROM Students
WHERE Student_ID IN (
    SELECT Student_ID
    FROM Courses
    WHERE Duration = '1 Year'
);
```

Name
Anaya Sharma
Sneha Patel
Aarav Gupta
Anaya Verma
Karan Singh

```

SELECT School_ID, Name,
       (SELECT COUNT(*) FROM Students WHERE School_ID =
Educational_Institution.School_ID) AS Student_Count
FROM Educational_Institution;

```

School_ID	Name	Student_Count
1	St. Xavier's High School	1
2	Government Higher Secondary School	1
3	D.A.V. Public School	1
4	Army Public School	1
5	Jawahar Navodaya Vidyalaya	1