NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL

DATABASE MANAGEMENT PROJECT

Topic : Smile Portal Registrations

Group Members :

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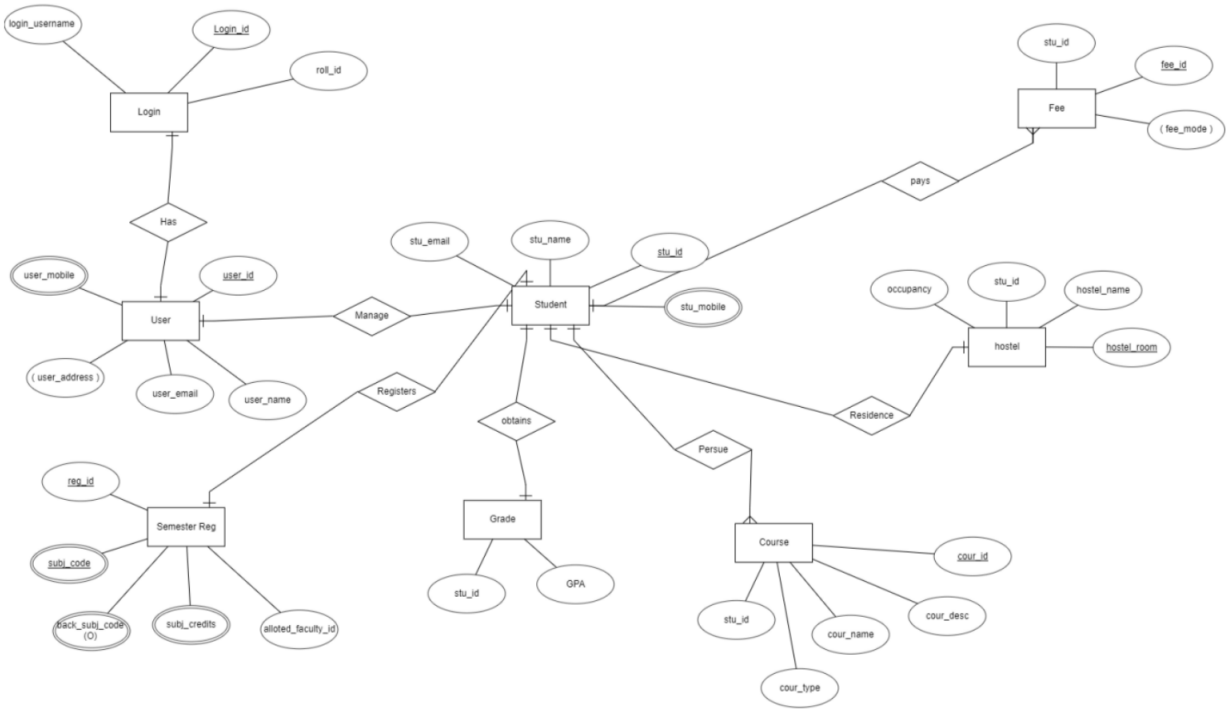
PROBLEM STATEMENT :

In this Project SMILE PORTAL REGISTRATIONS , we aim to build a database management system to store the data of students such as backlog subjects , semester registrations of the college .

We are building the model in such a way that it will help students to know about the allotted faculties , CGPA , backlog subjects , Hostels , Fees Payment , Department .

Entity Relationship Diagram



Schema:

Users (user_id PK, username, password)

Students (student_id PK, user_id FK, first_name, last_name, address)

ContactDetails (student_id PK FK, email, phone)

Hostels (hostel_id PK, name, capacity, available_rooms)

Fees (fee_id PK, student_id FK, amount, status)

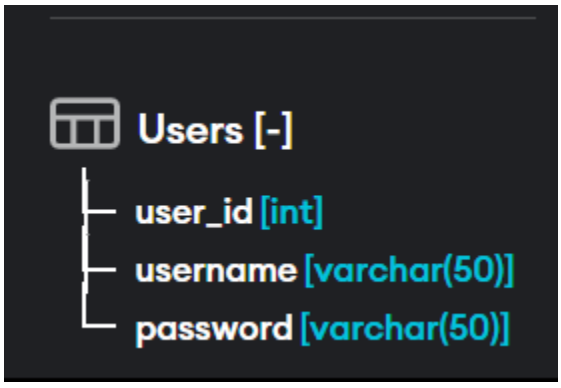
Courses (course_id PK, name, department, credits)

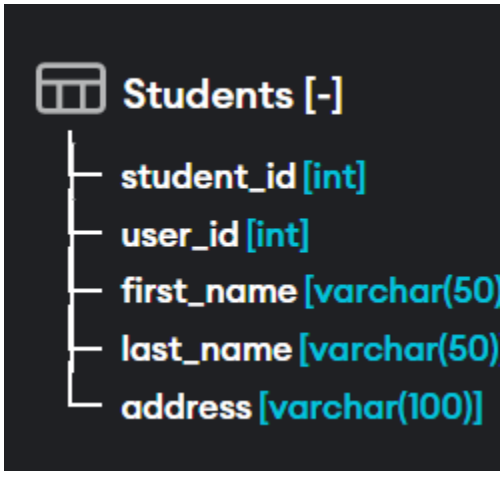
Grades (grade_id PK, student_id FK, course_id FK, grade)

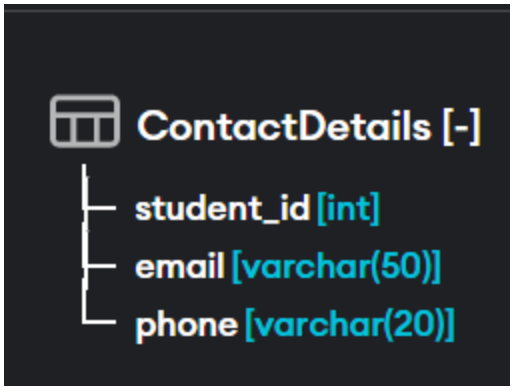
Semesters (semester_id PK, name, start_date, end_date)

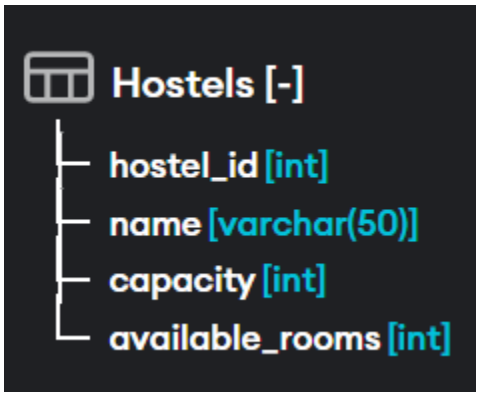
Faculty (faculty_id PK, first_name, last_name, email, phone, department)

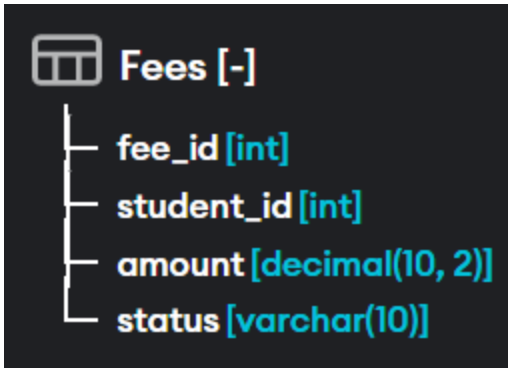
Table Structure :



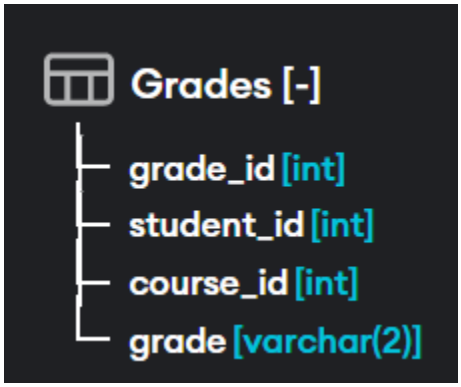


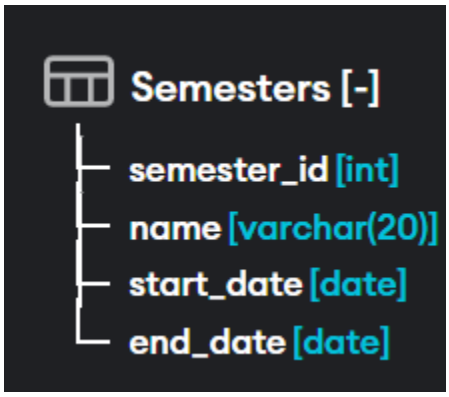


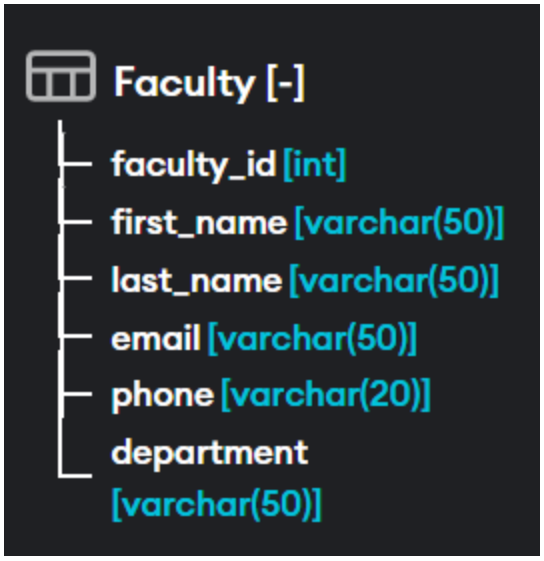

Hostels [-]
hostel_id [int]
name [varchar(50)]
capacity [int]
available_rooms [int]


Fees [-]
fee_id [int]
student_id [int]
amount [decimal(10, 2)]
status [varchar(10)]


Courses [-]
course_id [int]
name [varchar(50)]
department [varchar(50)]
credits [int]


Grades [-]
grade_id [int]
student_id [int]
course_id [int]
grade [varchar(2)]


Semesters [-]
semester_id [int]
name [varchar(20)]
start_date [date]
end_date [date]


Faculty [-]
faculty_id [int]
first_name [varchar(50)]
last_name [varchar(50)]
email [varchar(50)]
phone [varchar(20)]
department
[varchar(50)]

Functional Dependencies

Users table:

user_id -> username, password

Students table:

student_id -> user_id, first_name, last_name, email, phone, address

Hostels table:

hostel_id -> name, capacity, available_rooms

Fees table:

fee_id -> student_id, amount, status

Courses table:

course_id -> name, department, credits

Grades table:

grade_id -> student_id, course_id, grade

Semesters table:

semester_id -> name, start_date, end_date

Faculty table:

faculty_id -> first_name, last_name, email, phone, department

NORMALIZATION :

Step 1: Convert repeating groups to separate tables.

We can see that the Students table has a repeating group for email and phone. We'll move those attributes to a separate table called ContactDetails.

```
CREATE TABLE ContactDetails (

    student_id INT,

    email VARCHAR(50) NOT NULL,

    phone VARCHAR(20) NOT NULL,

    PRIMARY KEY (student_id),

    FOREIGN KEY (student_id) REFERENCES Students(student_id)

);
```

Step 2: Remove partial dependencies and create separate tables.

We can see that the Students table has a partial dependency on user_id. To remove this dependency, we'll create a separate table called Users with the user_id, username, and password.

```
CREATE TABLE Users (

    user_id INT PRIMARY KEY,

    username VARCHAR(50) NOT NULL,

    password VARCHAR(50) NOT NULL

);
```

Step 3: Create separate tables for many-to-many relationships.

We can see that the Grades table represents a many-to-many relationship between students and courses. To handle this, we'll create a separate table called StudentCourses.

```
CREATE TABLE StudentCourses (
    student_id INT,
    course_id INT,
    grade VARCHAR(2) NOT NULL,
    PRIMARY KEY (student_id, course_id),
    FOREIGN KEY (student_id) REFERENCES Students(student_id),
    FOREIGN KEY (course_id) REFERENCES Courses(course_id)
);
```

SQL CODE :

Table Creation :

```sql
CREATE TABLE Users (
    user_id INT PRIMARY KEY,
    username VARCHAR(50) NOT NULL,
    password VARCHAR(50) NOT NULL
);

CREATE TABLE Students (
    student_id INT PRIMARY KEY,
    user_id INT,
    first_name VARCHAR(50) NOT NULL,
    last_name VARCHAR(50) NOT NULL,
    address VARCHAR(100) NOT NULL,
    FOREIGN KEY (user_id) REFERENCES Users(user_id)
);
```

```sql
CREATE TABLE ContactDetails (
    student_id INT PRIMARY KEY,
    email VARCHAR(50) NOT NULL,
    phone VARCHAR(20) NOT NULL,
    FOREIGN KEY (student_id) REFERENCES Students(student_id)
);


CREATE TABLE Hostels (
    hostel_id INT PRIMARY KEY,
    name VARCHAR(50) NOT NULL,
    capacity INT NOT NULL,
    available_rooms INT NOT NULL
);
CREATE TABLE Fees (
    fee_id INT PRIMARY KEY,
    student_id INT,
```

```
    amount DECIMAL(10, 2) NOT NULL,

    status VARCHAR(10) NOT NULL,

    FOREIGN KEY (student_id) REFERENCES Students(student_id)

);

CREATE TABLE Courses (

    course_id INT PRIMARY KEY,

    name VARCHAR(50) NOT NULL,

    department VARCHAR(50) NOT NULL,

    credits INT NOT NULL

);

CREATE TABLE Grades (

    grade_id INT PRIMARY KEY,

    student_id INT,

    course_id INT,

    grade VARCHAR(2) NOT NULL,

    FOREIGN KEY (student_id) REFERENCES Students(student_id),

    FOREIGN KEY (course_id) REFERENCES Courses(course_id)
```

```
);

CREATE TABLE Semesters (

    semester_id INT PRIMARY KEY,

    name VARCHAR(20) NOT NULL,

    start_date DATE NOT NULL,

    end_date DATE NOT NULL

);

CREATE TABLE Faculty (

    faculty_id INT PRIMARY KEY,

    first_name VARCHAR(50) NOT NULL,

    last_name VARCHAR(50) NOT NULL,

    email VARCHAR(50) NOT NULL,

    phone VARCHAR(20) NOT NULL,

    department VARCHAR(50) NOT NULL

);
```

INSERTION :

User Table :

```
INSERT INTO Users (user_id, username, password)

VALUES

(1, 'Amitabh', 'Bachchan'),

(2, 'Shah Rukh', 'Khan'),

(3, 'Salman', 'Khan'),

(4, 'Aamir', 'Khan'),

(5, 'Deepika', 'Padukone'),

(6, 'Priyanka', 'Chopra'),

(7, 'Kareena', 'Kapoor'),

(8, 'Hrithik', 'Roshan'),

(9, 'Ranveer', 'Singh'),
```

```
(10, 'Alia', 'Bhatt');
```

Students Table :

```
INSERT INTO Students (student_id, user_id, first_name, last_name, address)

VALUES

(1, 1, 'Amit', 'Gupta', '123 Main Street, New Delhi'),

(2, 2, 'Anjali', 'Singh', '456 Elm Street, Mumbai'),

(3, 3, 'Arjun', 'Yadav', '789 Maple Street, Chennai'),

(4, 4, 'Bhavya', 'Kumari', '1010 Oak Street, Kolkata'),

(5, 5, 'Charu', 'Tiwari', '1111 Pine Street, Bangalore'),

(6, 6, 'Deepak', 'Sharma', '1212 Birch Street, Hyderabad'),

(7, 7, 'Divya', 'Patel', '1313 Cedar Street, Pune'),

(8, 8, 'Gaurav', 'Agarwal', '1414 Dogwood Street, Ahmedabad'),

(9, 9, 'Harsh', 'Verma', '1515 Ash Street, Surat'),
```

```
(10, 10, 'Himanshu', 'Yadav', '1616 Elm Street, Jaipur');
```

Contact Details Table

```
INSERT INTO ContactDetails (student_id, email, phone)

VALUES

(1, 'amit.gupta@gmail.com', '9876543210'),

(2, 'anjali.singh@gmail.com', '1234567890'),

(3, 'arjun.yadav@gmail.com', '0987654321'),

(4, 'bhavya.kumari@gmail.com', '1234567890'),

(5, 'charu.tiwari@gmail.com', '9876543210'),

(6, 'deepak.sharma@gmail.com', '1234567890'),

(7, 'divya.patel@gmail.com', '0987654321'),

(8, 'gaurav.agarwal@gmail.com', '1234567890'),
```

```
(9, 'harsh.verma@gmail.com', '0987654321'),

(10, 'himanshu.yadav@gmail.com', '1234567890');
```

Hostel Table

```
INSERT INTO Hostels (hostel_id, name, capacity, available_rooms)

VALUES

(1, 'Hostel 1', 100, 100),

(2, 'Hostel 2', 200, 100),

(3, 'Hostel 3', 300, 100),

(4, 'Hostel 4', 400, 100),

(5, 'Hostel 5', 500, 100),

(6, 'Hostel 6', 600, 100),

(7, 'Hostel 7', 700, 100),

(8, 'Hostel 8', 800, 100),

(9, 'Hostel 9', 900, 100),
```

```
(10, 'Hostel 10', 1000, 100);
```

Fees Table :

```
INSERT INTO Fees (fee_id, student_id, amount, status)

VALUES

(1, 1, 1000.00, 'Pending'),

(2, 2, 2000.00, 'Paid'),

(3, 3, 3000.00, 'Pending'),

(4, 4, 4000.00, 'Paid'),

(5, 5, 5000.00, 'Pending'),

(6, 6, 6000.00, 'Paid'),

(7, 7, 7000.00, 'Pending'),

(8, 8, 8000.00, 'Paid'),

(9, 9, 9000.00, 'Pending'),

(10, 10, 10000.00, 'Paid');
```

Courses Table :

```
INSERT INTO Courses (course_id, name, department, credits)

VALUES

(1, 'Hindi', 'Hindi', 3),

(2, 'English', 'English', 3),

(3, 'Mathematics', 'Mathematics', 3),

(4, 'Science', 'Science', 3),

(5, 'History', 'History', 3),

(6, 'Geography', 'Geography', 3),

(7, 'Political Science', 'Political Science', 3),

(8, 'Economics', 'Economics', 3),

(9, 'Commerce', 'Commerce', 3),

(10, 'Computer Science', 'Computer Science', 3) ;
```

Grades Table

```
INSERT INTO Grades (grade_id, student_id, course_id, grade)

VALUES

(1, 1, 1, 'A'),

(2, 2, 2, 'A'),

(3, 3, 3, 'A'),

(4, 4, 4, 'A'),

(5, 5, 5, 'A'),

(6, 6, 6, 'A'),

(7, 7, 7, 'A'),

(8, 8, 8, 'A'),

(9, 9, 9, 'A'),
```

```
(10, 10, 10, 'A');
```

Semester Table

```
INSERT INTO Semesters (semester_id, name, start_date, end_date)

VALUES

(1, 'Semester 1', '2023-06-01', '2023-09-30'),

(2, 'Semester 2', '2023-10-01', '2024-03-31'),

(3, 'Semester 3', '2024-04-01', '2024-08-31'),

(4, 'Semester 4', '2024-09-01', '2025-03-31'),

(5, 'Semester 5', '2025-04-01', '2025-08-31'),

(6, 'Semester 6', '2025-09-01', '2026-03-31'),

(7, 'Semester 7', '2026-04-01', '2026-08-31'),

(8, 'Semester 8', '2026-09-01', '2027-03-31'),
```

```
(9, 'Semester 9', '2027-04-01', '2027-08-31'),

(10, 'Semester 10', '2027-09-01', '2028-03-31');
```

Faculty Table

```
INSERT INTO Faculty (faculty_id, first_name, last_name, email, phone,
department)

VALUES

(1, 'Rahul', 'Gandhi', 'rahul.gandhi@gmail.com', '9876543210', 'Computer
Science'),

(2, 'Priya', 'Kumari', 'priya.kumari@gmail.com', '1234567890', 'Mathematics'),

(3, 'Rohit', 'Sharma', 'rohit.sharma@gmail.com', '0987654321', 'Physics'),

(4, 'Aditi', 'Singh', 'aditi.singh@gmail.com', '1234567890', 'Chemistry'),

(5, 'Rishabh', 'Arora', 'rishabh.arora@gmail.com', '9876543210', 'Biology'),

(6, 'Tanmay', 'Gupta', 'tanmay.gupta@gmail.com', '1234567890', 'Economics'),

(7, 'Sahil', 'Mehta', 'sahil.mehta@gmail.com', '0987654321', 'English'),
```

```
(8, 'Neha', 'Yadav', 'neha.yadav@gmail.com', '1234567890', 'History'),


(9, 'Kunal', 'Patel', 'kunal.patel@gmail.com', '9876543210', 'Political
Science'),


(10, 'Avni', 'Tiwari', 'avni.tiwari@gmail.com', '1234567890', 'Sociology');
```

THANK YOU !!