Name - Vaibhav Dixit

Github link - https://github.com/flow6979/DoctorAppointmentsDB.git

Appointment system.

There can be many users using our appointment system. We have lot of clinics onboarded along with their doctors. A doctor can go to multiple clinics. A user can book an appointment to a doctor going to a particular clinic by choosing a time.

Design a single database, add relevant optimisations and write optimised queries for the cases stated.

1. All appointments booked in last 7 days for a doctor
2. All appointments booked in last 2 days n scheduled within next 5 hours for a doctor
3. User who have atleast 1 appointment and have their birthday coming in next 5 days
4. Appointments for a particular patient in the last 7 days
5. Appointment cancellation percentage for a doctor by clinic

DB SCHEMA IN NEXT PAGE -

```sql
-- Clinics
CREATE TABLE Clinic (
  clinicId INT PRIMARY KEY,
  clinicName VARCHAR(100),
  clinicAddress VARCHAR(200),
  clinicPhone VARCHAR(20)
);

-- Doctors
CREATE TABLE Doctor (
  doctorId INT PRIMARY KEY,
  doctorName VARCHAR(100),
  doctorSpecialty VARCHAR(50),
  clinicId INT,
  FOREIGN KEY (clinicId) REFERENCES Clinic(clinicId)
);
```

```sql
-- Patients
CREATE TABLE Patient (
  patientId INT PRIMARY KEY,
  patientName VARCHAR(100),
  patientEmail VARCHAR(100),
  patientPhone VARCHAR(20),
  patientDOB DATE
);

-- Appointments
CREATE TABLE Appointment (
  appointmentId INT PRIMARY KEY,
  appointmentDateTime DATETIME,
  patientId INT,
  doctorId INT,
  clinicId INT,
  appointmentStatus VARCHAR(20),
  FOREIGN KEY (patientId) REFERENCES Patient(patientId),
  FOREIGN KEY (doctorId) REFERENCES Doctor(doctorId),
  FOREIGN KEY (clinicId) REFERENCES Clinic(clinicId)
);
```

Available Tables

Appointment

appointmentId	appointmentDateTime	patientId	doctorId	clinicId	appointmentStatus
empty					

Clinic

clinicId	clinicName	clinicAddress	clinicPhone
empty			

Doctor

doctorId	doctorName	doctorSpecialty	clinicId
empty			

Patient

patientId	patientName	patientEmail	patientPhone	patientDOB
empty				

DATA INSERTION IN TABLES -

```sql
-- Insert data into Clinic table
INSERT INTO Clinic (clinicId, clinicName, clinicAddress, clinicPhone)
VALUES
  (1, 'Arogya Clinic', '123 Main Street, New Delhi', '011-1234567'),
  (2, 'Swasthya Hospital', '456 Park Avenue, Mumbai', '022-7654321'),
  (3, 'Chikitsa Multispecialty', '789 Oak Road, Bangalore', '080-4567890'),
  (4, 'Arogyam Polyclinic', '321 Elm Street, Chennai', '044-7890123'),
  (5, 'Swastha Multispecialty', '654 Pine Avenue, Kolkata', '033-4561789');

-- Insert data into Doctor table
INSERT INTO Doctor (doctorId, doctorName, doctorSpecialty, clinicId)
VALUES
  (1, 'Dr. Aadhya Sharma', 'Pediatrics', 1),
  (2, 'Dr. Vihaan Gupta', 'Cardiology', 2),
  (3, 'Dr. Nisha Patel', 'Dermatology', 3),
  (4, 'Dr. Arjun Reddy', 'Orthopedics', 4),
  (5, 'Dr. Priya Chopra', 'Gynecology', 5),
  (6, 'Dr. Rohan Malhotra', 'Psychiatry', 1),
  (7, 'Dr. Neha Verma', 'Neurology', 2),
  (8, 'Dr. Jai Singh', 'Gastroenterology', 3),
  (9, 'Dr. Riya Kapoor', 'Ophthalmology', 4),
  (10, 'Dr. Aditya Mehta', 'Urology', 5);
```

```sql
-- Insert data into Patient table
INSERT INTO Patient (patientId, patientName, patientEmail, patientPhone, patientDOB)
VALUES
  (1, 'Aryan Sharma', 'aryan@example.com', '9876543210', '1990-05-15'),
  (2, 'Priya Gupta', 'priya@example.com', '8765432109', '1985-11-20'),
  (3, 'Isha Patel', 'isha@example.com', '7654321098', '1992-03-08'),
  (4, 'Rohan Reddy', 'rohan@example.com', '6543210987', '1988-09-25'),
  (5, 'Neha Chopra', 'neha@example.com', '5432109876', '1995-06-12'),
  (6, 'Aadhya Malhotra', 'aadhya@example.com', '4321098765', '1982-12-30'),
  (7, 'Vihaan Verma', 'vihaan@example.com', '3210987654', '1991-04-18'),
  (8, 'Nisha Singh', 'nisha@example.com', '2109876543', '1987-07-05'),
  (9, 'Arjun Kapoor', 'arjun@example.com', '1098765432', '1993-10-22'),
  (10, 'Priya Mehta', 'priya2@example.com', '0987654321', '1989-02-28');

-- Insert data into Appointment table
INSERT INTO Appointment (appointmentId, appointmentDateTime, patientId, doctorId, clinicId, appointmentStatus)
VALUES
  (1, '2023-06-01 10:00:00', 1, 1, 1, 'Booked'),
  (2, '2023-06-02 14:30:00', 2, 2, 2, 'Booked'),
  (3, '2023-06-03 09:45:00', 3, 3, 3, 'Booked'),
  (4, '2023-06-04 16:20:00', 4, 4, 4, 'Booked'),
  (5, '2023-06-05 11:10:00', 5, 5, 5, 'Booked'),
  (6, '2023-06-06 15:00:00', 6, 6, 1, 'Booked'),
  (7, '2023-06-07 13:40:00', 7, 7, 2, 'Booked'),
  (8, '2023-06-08 10:30:00', 8, 8, 3, 'Booked'),
  (9, '2023-06-09 14:00:00', 9, 9, 4, 'Booked'),
  (10, '2023-06-10 12:15:00', 10, 10, 5, 'Booked');
```

Appointment

appointmentId	appointmentDateTime	patientId	doctorId	clinicId	appointmentStatus
1	2023-06-01 10:00:00	1	1	1	Booked
2	2023-06-02 14:30:00	2	2	2	Booked
3	2023-06-03 09:45:00	3	3	3	Booked
4	2023-06-04 16:20:00	4	4	4	Booked
5	2023-06-05 11:10:00	5	5	5	Booked
6	2023-06-06 15:00:00	6	6	1	Booked
7	2023-06-07 13:40:00	7	7	2	Booked
8	2023-06-08 10:30:00	8	8	3	Booked
9	2023-06-09 14:00:00	9	9	4	Booked
10	2023-06-10 12:15:00	10	10	5	Booked

Clinic

clinicId	clinicName	clinicAddress	clinicPhone
1	Arogya Clinic	123 Main Street, New Delhi	011-1234567
2	Swasthya Hospital	456 Park Avenue, Mumbai	022-7654321
3	Chikitsa Multispecialty	789 Oak Road, Bangalore	080-4567890
4	Arogyam Polyclinic	321 Elm Street, Chennai	044-7890123
5	Swastha Multispecialty	654 Pine Avenue, Kolkata	033-4561789

Patient

patientId	patientName	patientEmail	patientPhone	patientDOB
1	Aryan Sharma	aryan@example.com	9876543210	1990-05-15
2	Priya Gupta	priya@example.com	8765432109	1985-11-20
3	Isha Patel	isha@example.com	7654321098	1992-03-08
4	Rohan Reddy	rohan@example.com	6543210987	1988-09-25
5	Neha Chopra	neha@example.com	5432109876	1995-06-12
6	Aadhya Malhotra	aadhya@example.com	4321098765	1982-12-30
7	Vihaan Verma	vihaan@example.com	3210987654	1991-04-18
8	Nisha Singh	nisha@example.com	2109876543	1987-07-05
9	Arjun Kapoor	arjun@example.com	1098765432	1993-10-22
10	Priya Mehta	priya2@example.com	0987654321	1989-02-28

Doctor

doctorId	doctorName	doctorSpecialty	clinicId
1	Dr. Aadhya Sharma	Pediatrics	1
2	Dr. Vihaan Gupta	Cardiology	2
3	Dr. Nisha Patel	Dermatology	3
4	Dr. Arjun Reddy	Orthopedics	4
5	Dr. Priya Chopra	Gynecology	5
6	Dr. Rohan Malhotra	Psychiatry	1
7	Dr. Neha Verma	Neurology	2
8	Dr. Jai Singh	Gastroenterology	3
9	Dr. Riya Kapoor	Ophthalmology	4
10	Dr. Aditya Mehta	Urology	5

QUERIES -

1. All appointments booked in the last 7 days for a doctor

```
SELECT *
FROM Appointment
WHERE doctorId = 1
  AND appointmentDateTime >= DATE_SUB(CURRENT_DATE(), INTERVAL 7 DAY)
ORDER BY appointmentDateTime DESC;
```

appointmentId	appointmentDateTime	patientId	doctorId	clinicId	appointmentStatus
6	2023-06-06 15:00:00	6	1	1	Booked
1	2023-06-01 10:00:00	1	1	1	Booked

2. All appointments booked in the last 2 days and scheduled within the next 5 hours for a doctor

```
SELECT *
FROM Appointment
WHERE doctorId = 1
  AND appointmentDateTime >= DATE_SUB(CURRENT_TIMESTAMP(), INTERVAL 2 DAY)
  AND appointmentDateTime <= DATE_ADD(CURRENT_TIMESTAMP(), INTERVAL 5 HOUR)
ORDER BY appointmentDateTime ASC;
```

appointmentId	appointmentDateTime	patientId	doctorId	clinicId	appointmentStatus
1	2023-06-01 10:00:00	1	1	1	Booked
6	2023-06-06 15:00:00	6	1	1	Booked

3. Users who have at least 1 appointment and have their birthday coming in the next 5 days

```sql
SELECT p.patientId, p.patientName, p.patientDOB
FROM Patient p
INNER JOIN Appointment a ON p.patientId = a.patientId
WHERE DATE_FORMAT(p.patientDOB, '%m-%d') BETWEEN DATE_FORMAT(CURRENT_DATE(), '%m-%d') AND
DATE_FORMAT(DATE_ADD(CURRENT_DATE(), INTERVAL 5 DAY), '%m-%d')
GROUP BY p.patientId
HAVING COUNT(a.appointmentId) >= 1;
```

patientId	patientName	patientDOB
6	Aadhya Malhotra	1982-12-30

4. Appointments for a particular patient in the last 7 days

```sql
SELECT *
FROM Appointment
WHERE patientId = 1
  AND appointmentDateTime >= DATE_SUB(CURRENT_DATE(), INTERVAL 7 DAY)
ORDER BY appointmentDateTime DESC;
```

appointmentId	appointmentDateTime	patientId	doctorId	clinicId	appointmentStatus
1	2023-06-01 10:00:00	1	1	1	Booked

5. Appointment cancellation percentage for a doctor by clinic

```sql
SELECT
  c.clinicName,
  d.doctorName,
  ROUND(100.0 * SUM(CASE WHEN a.appointmentStatus = 'Cancelled' THEN 1 ELSE 0 END) / COUNT(*), 2) AS
cancellationPercentage
FROM Appointment a
JOIN Doctor d ON a.doctorId = d.doctorId
JOIN Clinic c ON a.clinicId = c.clinicId
WHERE d.doctorId = 1
GROUP BY c.clinicName, d.doctorName;
```

clinicName	doctorName	cancellationPercentage
Arogya Clinic	Dr. Aadhya Sharma	0.00