INTERNSHALA

HEALTHCAREDB: SQL-BASED ANALYTICS AND INSIGHTS

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Objective of the Project

- Create normalized and relational database tables to store healthcare data securely and efficiently.
- Apply SQL queries to extract meaningful insights such as hospital performance, treatment costs, and patient demographics.
- Use advanced SQL features like aggregation, subqueries, views, and window functions to perform analytical operations.
- Support healthcare decision-making through data-driven metrics like average length of stay, treatment frequency, and total hospital revenue.

1. Patient Demographics: Retrieve the number of patients grouped by gender and calculate the average age of patients.

```
SELECT
    Gender,
    COUNT(PatientID) AS Total_Patients,
    ROUND(AVG(age), 2) AS Avg_Age
FROM
    Patients
GROUP BY Gender;
```

Gender	Total_Patients	Avg_Age
Male	5	50.20
Female	5	36.80

2. Hospital Utilization: Identify hospitals with the highest number of admissions.

```
SELECT
    hospitals.HospitalName, COUNT(admissions.PatientID) as Total_Patients
FROM
    hospitals
        JOIN
    admissions ON hospitals.HospitalID = admissions.HospitalID
GROUP BY HospitalName;
```

HospitalName	Total_Patients
General Hospital	2
City Clinic	2
Central Medical Center	2
Regional Health Facility	2
Sunrise Hospital	2

3.Treatment Costs: Calculate the total cost of treatments provided at each hospital.

```
SELECT
    hospitals.HospitalName AS Hospital_Name,
    SUM(treatments.Cost) AS Total_Treatment_Cost
FROM
    treatments
JOIN
    admissions ON treatments.AdmissionID = admissions.AdmissionID
 JOIN
    hospitals ON hospitals.HospitalID = admissions.HospitalID
GROUP BY HospitalName
ORDER BY Total_Treatment_Cost;
```

Hospital_Name	Total_Treatment_Cost
City Clinic	2200.00
Sunrise Hospital	2400.00
Regional Health Facility	2800.00
General Hospital	11000.00
Central Medical Center	16000.00

4. Length of Stay Analysis: Extract the average length of stay for patients grouped by hospital.

```
SELECT
   hospitals.HospitalName,
   ROUND(AVG(DATEDIFF(admissions.dischargeDate,
                      admissions.AdmissionDate)),1) AS Avg_Length_of_Stay
FROM
   hospitals
      JOIN
   admissions ON hospitals.HospitalID = admissions.HospitalID
GROUP BY HospitalName;
```

HospitalName	Avg_Length_of_Stay
General Hospital	4.0
City Clinic	4.0
Central Medical Center	5.0
Regional Health Facility	11.0
Sunrise Hospital	10.5

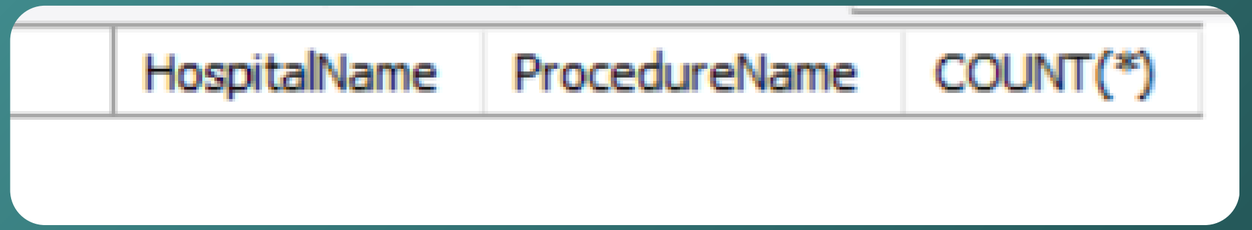
5. List all patients who stayed longer than 7 days in any hospital.

```
SELECT
    patients.FullName,
    DATEDIFF(admissions.DischargeDate,
            admissions.AdmissionDate) AS Stayed_longer
FROM
    patients
        JOIN
    admissions ON patients.PatientID = admissions.PatientID
WHERE
    DATEDIFF(admissions.DischargeDate,
            admissions.AdmissionDate) > 7;
```

FullName	Stayed_longer
Michael Scott	15
Sarah Taylor	14

6. Identify treatments that have been performed more than 5 times across all hospitals.

```
SELECT
    hospitals.HospitalName, treatments.ProcedureName, COUNT(*)
FROM
    treatments
        JOIN
    admissions ON treatments.AdmissionID = admissions.AdmissionID
        JOIN
    hospitals ON hospitals.HospitalID = admissions.HospitalID
GROUP BY HospitalName , ProcedureName
HAVING COUNT(*) > 5;
```



8. Combine lists of patients admitted for different reasons (e.g., surgery and therapy).

```
SELECT
    patients.FullName,
    admissions.AdmissionDate,
    admissions.DischargeDate,
    admissions.ReasonForAdmission
FROM
    patients
        JOIN
    admissions ON patients.PatientID = admissions.PatientID
WHERE
    admissions.ReasonForAdmission IN ('surgery' , 'therapy');
```

FullName	AdmissionDate	DischargeDate	ReasonForAdmission
John Doe	2024-11-01	2024-11-05	Surgery
Jane Smith	2024-11-03	2024-11-08	Therapy
Alice Johnson	2024-12-01	NULL	Surgery
Michael Scott	2024-12-03	2024-12-18	Therapy

9. Use a subquery to find the hospital with the highest average treatment cost.

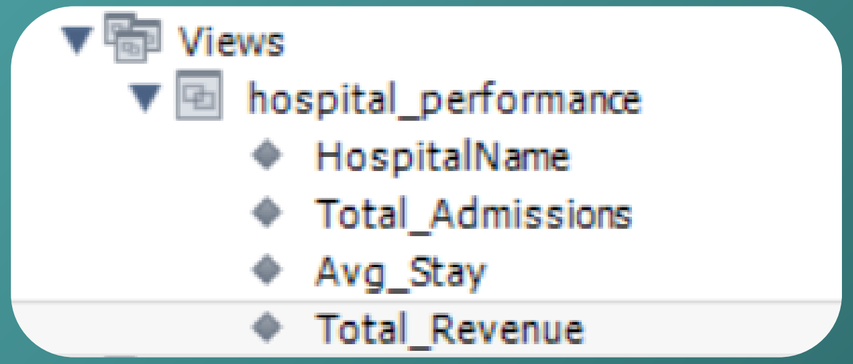
```
SELECT
    hospitals.HospitalName,
    ROUND(AVG(treatments.Cost), 1) AS Avg_Treatment_Cost
FROM
    treatments
        JOIN
    admissions ON admissions.AdmissionID = treatments.AdmissionID
        JOIN
    hospitals ON hospitals.HospitalID = admissions.HospitalID
GROUP BY HospitalName
ORDER BY Avg_Treatment_Cost;
```

HospitalName	Avg_Treatment_Cost
City Clinic	550.0
Sunrise Hospital	600.0
Regional Health Facility	700.0
General Hospital	2750.0
Central Medical Center	4000.0

10. Create a view named HospitalPerformance to display the total number of admissions, average length of stay, and total revenue generated for each hospital.

```
CREATE VIEW Hospital_Performance AS
SELECT
   h.HospitalName,
   COUNT(a.AdmissionID) AS Total_Admissions,
   ROUND(AVG(DATEDIFF(a.DischargeDate, a.AdmissionDate)), 2) AS Avg_Stay,
   SUM(t.Cost) AS Total_Revenue
FROM
   Admissions a
JOIN
   Treatments t ON a.AdmissionID = t.AdmissionID
JOIN
   Hospitals h ON h.HospitalID = a.HospitalID
```

```
WHERE
 a.DischargeDate IS NOT NULL -- optional: exclude ongoing admissions
GROUP BY
 h.HospitalName;
```




```
SELECT * FROM Hospital_Performance;
```

HospitalName	Total_Admissions	Avg_Stay	Total_Revenue
General Hospital	2	4.00	3000.00
City Clinic	4	4.00	2200.00
Central Medical Center	2	5.00	6000.00
Regional Health Facility	4	11.00	2800.00
Sunrise Hospital	4	10.50	2400.00

11. Use the RANK function to rank hospitals based on their total revenue.

```
SELECT
    h.HospitalName,
    SUM(t.Cost) AS Total_Revenue,
    RANK() OVER (ORDER BY SUM(t.Cost) DESC) AS Revenue_Rank
FROM
    Admissions a
JOIN
    Treatments t ON a.AdmissionID = t.AdmissionID
JOIN
    Hospitals h ON h.HospitalID = a.HospitalID
GROUP BY
    h.HospitalName;
```

HospitalName	Total_Revenue	Revenue_Rank
Central Medical Center	16000.00	1
General Hospital	11000.00	2
Regional Health Facility	2800.00	3
Sunrise Hospital	2400.00	4
City Clinic	2200.00	5

12. Use DENSE_RANK to rank treatments based on their frequency.

```
SELECT
    ProcedureName,
    COUNT(*) AS Frequency,
    DENSE_RANK() OVER (ORDER BY COUNT(*) DESC) AS Frequency_Rank
FROM
    Treatments
GROUP BY
    ProcedureName;
```

ProcedureName	Frequency	Frequency_Rank
Appendectomy	2	1
Physical Therapy	2	1
Fracture Repair	2	1
Blood Test	2	1
Antibiotics	2	1
Gallbladder Surgery	2	1
X-Ray	2	1
Chemotherapy	2	1
MRI Scan	2	1
Diabetes Treatment	2	1

.....THANK YOU.....