

HEALTH CARE ANALYSIS

A comprehensive SQL-based analysis of healthcare data including patient records, doctor appointments, treatments, billing, and departmental performance metrics.

Patient Registration and Demographics

LIST ALL PATIENTS AND THEIR CITY

```
SELECT NAME ,CITY FROM PATIENTS  
GROUP BY NAME ,CITY
```

COUNT TOTAL NUMBERS OF PATIENTS REGISTERD IN 2024

```
SELECT COUNT(NAME) AS COUNT_OF_PATIENTS FROM PATIENTS  
WHERE EXTRACT(YEAR FROM registration_date)='2024'
```

Appointment Status Analysis

RETRIEVE ALL COMPLETED APPOINTMENTS

```
SELECT * FROM appointments  
WHERE STATUS='Completed'
```

FIND ALL APPOINTMENT THAT WERE CANCELED

```
SELECT * FROM appointments  
WHERE status='Cancelled'
```

Department Structure and Doctor Distribution

FIND ALL UNIQUE DEPARTMENT AVAILABLES

```
SELECT DISTINCT(DEPARTMENT) FROM doctors
```

COUNT HOW MANY DOCTORS WORK IN EACH DEPARTMENT

```
SELECT DEPARTMENT ,COUNT(NAME) AS DOCTORS FROM doctors  
GROUP BY DEPARTMENT
```

Financial Analysis by Department

SHOW THE AVERAGE CONSULTATION FEE PER DEPARTMENT

```
SELECT department ,SUM(consultation_fee)/COUNT(name) AS AVG_FEE FROM doctors  
GROUP BY department
```

SHOW COUNT OF DOCTORS AND TOTAL FEE FOR EACH DEPARTMENT

```
SELECT department , COUNT(name) ,SUM(consultation_fee)FROM doctors  
GROUP BY department
```

Doctor Performance Metrics

FIND THE TOP 5 DOCTORS BY NUMBER OF APPOINTMENTS

```
SELECT NAME,COUNT(NAME) AS APP FROM doctors  
INNER JOIN appointments ON doctors.doctor_id=appointments.doctor_id  
GROUP BY NAME ORDER BY APP DESC LIMIT 5
```

CALCULATE TOTAL REVENUE GENERATED BY EACH DOCTOR

```
SELECT NAME , SUM(consultation_fee) AS TOTAL_REVENUE FROM doctors  
INNER JOIN appointments ON doctors.doctor_id=appointments.doctor_id  
GROUP BY NAME ORDER BY TOTAL_REVENUE DESC
```

SHOW THE NUMBER OF PATIENTS TREATED BY EACH DOCTOR

```
SELECT doctors.NAME,COUNT(patients.NAME) COUNT_OF_PATIENTS_TREATED FROM doctors  
INNER JOIN appointments ON doctors.doctor_id=appointments.doctor_id  
INNER JOIN patients ON appointments.patient_id=patients.patient_id  
GROUP BY doctors.NAME ORDER BY COUNT_OF_PATIENTS_TREATED DESC
```

Patient Visit Patterns and Diagnosis Trends

RETRIVE ALL PATIENTS WHO VISITED MORE THAN 3 TIMES

```
SELECT NAME,COUNT(NAME) AS COUNT_OF_VISIT FROM patients
INNER JOIN appointments ON patients.patient_id=appointments.patient_id
GROUP BY NAME
HAVING COUNT_OF_VISIT > 3
ORDER BY COUNT_OF_VISIT DESC
```

FIND THE MOST COMMON DIAGANOSIS AMONG PAITENTS.

```
SELECT diagnosis ,COUNT(diagnosis) AS COUNT_OF_diagnosis FROM patients
INNER JOIN appointments ON patients.patient_id=appointments.patient_id
GROUP BY diagnosis ORDER BY COUNT_OF_diagnosis DESC LIMIT 5
```

Revenue and Billing Analysis

GET MONTHLY TOTAL REVENUE FROM TREATMENT

```
SELECT MONTHNAME(STR_TO_DATE(appointment_date, '%d-%m-%Y')) AS month ,SUM(cost) FROM appointments  
RIGHT JOIN treatments ON appointments.appointment_id=treatments.appointment_id  
GROUP BY MONTH
```

LIST ALL PATIENTS WHO HAVE UNPAID BILLS

```
SELECT * FROM patients  
INNER JOIN appointments ON patients.patient_id=appointments.patient_id  
INNER JOIN billing ON appointments.appointment_id=billing.appointment_id  
WHERE payment_status='Pending'
```

Advanced Treatment Cost Analysis

FIND DOCTORS WHOSE AVG TREATMENT COST > 10000

```
SELECT doctors.name,COUNT(doctors.name) AS NUMBER_OF_TREATMENT,SUM(treatments.cost) AS  
TOTAL_REVENUE, SUM(treatments.cost)/COUNT(doctors.name) AS AVG_TREATMENT_COST FROM treatments  
INNER JOIN appointments ON appointments.appointment_id=treatments.appointment_id  
INNER JOIN doctors ON doctors.doctor_id=appointments.doctor_id  
GROUP BY doctors.name  
HAVING AVG_TREATMENT_COST >10000  
ORDER BY AVG_TREATMENT_COST DESC
```

CALCULATE AVG TREATMENT COST PER DIAGNOSIS AND RANK THEM

```
SELECT diagnosis,SUM(treatments.cost) AS TOTAL_REVENUE , COUNT(treatments.treatment_id) AS  
TOTAL_TREATMENT ,SUM(treatments.cost)/COUNT(treatments.treatment_id) AS AVG_COST,  
RANK() OVER(ORDER BY SUM(treatments.cost)/COUNT(treatments.cost) )AS COST_RANK FROM treatments  
INNER JOIN appointments ON appointments.appointment_id=treatments.appointment_id  
GROUP BY diagnosis
```

Performance Rankings and Department Profitability

RANK DOCTORS BY TOTAL REVENUE USING RANK()

```
SELECT doctors.name,SUM(treatments.cost) AS TOTAL_REVENUE, RANK () OVER(ORDER BY SUM(treatments.cost)  
DESC ) AS RANK_BY_REVENUE FROM treatments  
INNER JOIN appointments ON appointments.appointment_id=treatments.appointment_id  
INNER JOIN doctors ON doctors.doctor_id=appointments.doctor_id  
GROUP BY doctors.name
```

COMPUTE DOCTOR PERFORMANCE SCORE

```
SELECT doctors.name ,COUNT(treatments.treatment_id) AS TOTAL_TREATMENTS  
,SUM(treatments.cost)/COUNT(treatments.treatment_id)AS AVG_COST,SUM(CASE WHEN status = 'Cancelled'  
THEN 1 ELSE 0 END)AS CANCELLATIONS FROM treatments  
INNER JOIN appointments ON appointments.appointment_id=treatments.appointment_id  
INNER JOIN doctors ON doctors.doctor_id=appointments.doctor_id  
GROUP BY doctors.name
```

FIND TOP 2 MOST PROFITABLE DEPARTMENTS

```
SELECT doctors.department,SUM(billing.total_amount)AS REVENUE ,RANK () OVER(ORDER BY  
SUM(billing.total_amount)) AS REVENUE_RANK FROM appointments  
INNER JOIN doctors ON doctors.doctor_id=appointments.doctor_id  
INNER JOIN billing ON billing.appointment_id=appointments.appointment_id  
GROUP BY doctors.department  
LIMIT 2
```