

# HOSPITAL MANAGEMENT SYSTEM ANALYSIS

## SQL CASE STUDY PROJECT

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# HELLO

I'm Ghanshyam Kumar . In this project, I have utilized SQL queries to analyze the Hospital Management System dataset case study and answer the various questions related to the Hospitals.



# AGENDA

- INTRODUCTION TO THE DATASET
- DATASET SCHEMAS
- TABLE DESCRIPTIONS
- LIST OF QUERY'S
- BASIC QUERY'S
- JOINS QUERY'S
- SUBQUERY



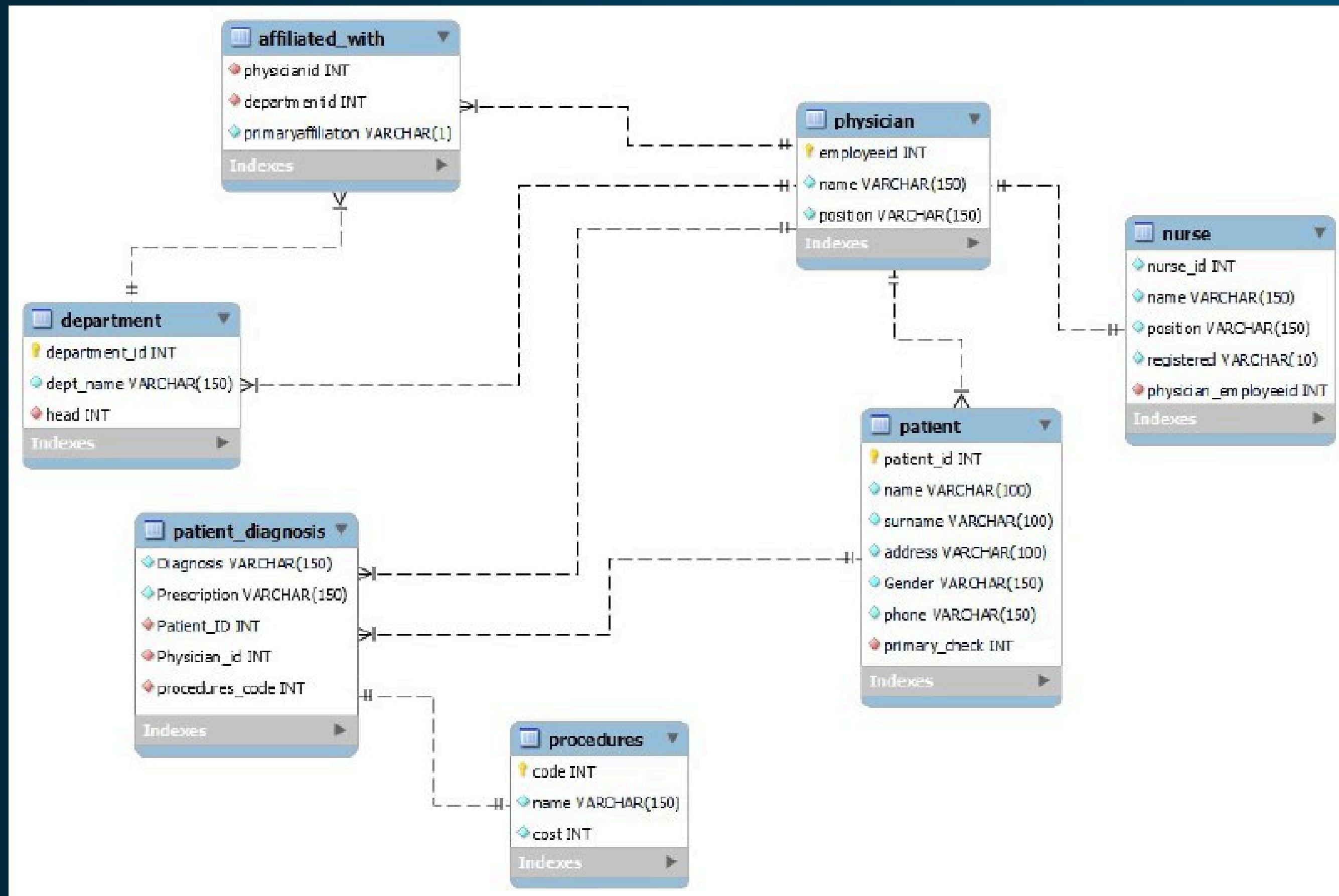
# INTRODUCTION TO THE DATASET

The hospital management dataset is a comprehensive collection of data designed to provide insights into various aspects of hospital operations and patient care. This dataset includes the following 7 tables:

1. Physician
2. Affiliated with
3. Department
4. Procedures
5. Patient Diagnosis
6. Patient
7. Nurse



# DATASET SCHEMAS



# TABLE DESCRIPTION

## 1. PHYSICIAN :

Field	Type	Null	Key	Default	Extra
employeeid	int	NO	PRI	NULL	
name	varchar(150)	NO		NULL	
position	varchar(150)	NO		NULL	

## 2. AFFILIATED\_WITH :

Field	Type	Null	Key	Default	Extra
physicianid	int	NO	MUL	NULL	
departmentid	int	NO	MUL	NULL	
primaryaffiliation	varchar(1)	NO		NULL	

### 3. DEPARTMENT :

Field	Type	Null	Key	Default
department_id	int	NO	PRI	NULL
dept_name	varchar(150)	NO		NULL
head	int	NO	MUL	NULL

### 5. PATIENT

Field	Type	Null	Key	Default	Extra
patient_id	int	NO	PRI	NULL	auto_increment
name	varchar(100)	NO		NULL	
surname	varchar(100)	NO		NULL	
address	varchar(100)	NO		NULL	
Gender	varchar(150)	NO		NULL	
primary_check	int	NO	MUL	NULL	

### 4. NURSE :

Field	Type	Null	Key	Default
nurse_id	int	NO		NULL
name	varchar(150)	NO		NULL
position	varchar(150)	NO		NULL
registered	varchar(10)	NO		NULL

## 6. PATIENT\_DIAGNOSIS

Field	Type	Null	Key	Default	Extra
Diagnosis	varchar(150)	NO		HULL	
Prescription	varchar(150)	NO		HULL	
Patient_ID	int	NO	MUL	HULL	
Physician_id	int	NO	MUL	HULL	

## 7. PROCEDURES :

Field	Type	Null	Key	Default	Extra
code	int	NO	PRI	HULL	
name	varchar(150)	NO		HULL	
cost	int	NO		HULL	

# QUERY'S

1. Write a query in SQL to obtain the name of the physician in alphabetical order.
2. Write a query in SQL to obtain the fullname of the patients whose gender is male.
3. Write a query in SQL to find the name of the nurse who are the head of their department and are registered.
4. Write a query in SQL to find the name of the nurse who are Team Leader or not registered.
5. Write a query to obtain the avg cost of all the medical procedures.
6. Write a query to obtain name and cost of the procedure whose cost is greater than 2000.
7. Write a query to update the name of the patient to Robert Fernandez having patientid as 5.
8. Write a query to drop phone column from patient table.
9. Second maximum cost of medical procedure
10. Write a query in SQL to obtain the name of the patients starting with letter A.
11. Write a query in SQL to obtain the name of the patients whose third letter is M.
12. Write a query in SQL to obtain the name of the patients whose name start with letter J and ends with Z.
13. Write a query to obtain patient details having patient\_id 11 to 20.
14. Write a query in SQL to obtain the name of the physicians who are the head of each department
15. Write a query in SQL to obtain the name of the patients with their physicians by whom they got their preliminary treatment
16. Write a query in SQL to obtain the name of the physician with the department who are done with affiliation.
17. Write a query to obtain physician name,position and department they are affiliated with.
18. Write a query in SQL to obtain the patient name from which physician they get primary\_checkup and also mention the patient diagnosis with prescription.
19. Write a query in SQL to obtain the maximum cost of the medical procedure.
20. Write a query in SQL to obtain the details of patient who has diagnosed with chronic pain.
21. Write a query in SQL to obtain the procedure name and cost whose cost is greater than the avg cost of all the procedure.
22. Write a query in SQL to obtain the procedure name and cost whose cost is less than the avg cost of all the procedure.
23. Write a query in SQL to obtain the physician name who are either head chief or senior in their respective department.
24. Write a query in SQL to obtain the employeeid, physician name and position whose primary affiliation has not been done.

# Q1. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PHYSICIAN IN ALPHABETICAL ORDER.

```
SELECT name AS Physician_Name  
FROM physician  
ORDER BY name;
```

Physician_Name
Dr.Aaliyah Craig
Dr.Alexis Estes
Dr.Ariya Bradley
Dr.Berkley McKenzie
Dr.Bob Kelso
Dr.Brynn Harrison
Dr.Cali Vazquez
Dr.Cedric Kelley
Dr.Christopher Turk
Dr.Dillon Gandy

## Q2. WRITE A QUERY IN SQL TO OBTAIN THE FULLNAME OF THE PATIENTS WHOSE GENDER IS MALE.

```
SELECT CONCAT(name, ' ', surname) AS Patients_Fullname, gender  
FROM patient  
WHERE gender = 'male';
```

Patients_Fullname	gender
John Smith	Male
Remo Xavier	Male
Dennis Doe	Male
Robert Fernandez	Male
Michael Williams	Male
David Jones	Male
Christopher Wilson	Male
Matthew Martinez	Male
Daniel Garcia	Male
James Lopez	Male
Joshua Perez	Male
Ryan Flores	Male
Andrew Cruz	Male
Justin Morales	Male

**Q3. WRITE A QUERY IN SQL TO FIND THE NAME OF THE NURSE WHO ARE THE HEAD OF THEIR DEPARTMENT AND ARE REGISTERED.**

```
SELECT * FROM nurse  
WHERE position = 'Head Nurse' AND registered = "YES";
```

nurse_id	name	position	registered
1	Carla Espinosa	Head Nurse	Yes
7	Rose Hughes	Head Nurse	Yes
10	Olive Peterson	Head Nurse	Yes
21	Jamiya Villarreal	Head Nurse	Yes
31	Liliana Pace	Head Nurse	Yes

#### Q4. WRITE A QUERY IN SQL TO FIND THE NAME OF THE NURSE WHO ARE TEAM LEADER OR NOT REGISTERED.

```
SELECT name,position,registered  
FROM nurse  
WHERE position = 'Team Leader' OR registered = "NO";
```

name	position	registered
Paul Flowers	Nurse	No
Anna Rubel	Team Leader	No
Carolina Gomez	Nurse	No
Danna Martinez	Sister IR	No
Amelia Murray	Team Leader	Yes
Helena Martinez	Nurse	No
Diana Bell	Nurse	No
Jaqueline Olsen	Nurse	No
Cali McBride	Team Leader	Yes
Madilynn Velazquez	Nurse	No
Harmony Ramsey	Nurse	No
Mercedec Nguyen	Team Leader	Yes
Aurilia Kwanza	Nurse	No

**Q5. WRITE A QUERY TO OBTAIN THE AVG COST OF ALL THE MEDICAL PROCEDURES.**

```
SELECT AVG(cost) as Average_cost  
FROM procedures;
```

Average_cost
2552.5000

**Q6. WRITE A QUERY TO OBTAIN NAME AND COST OF THE PROCEDURE WHOSE COST IS GREATER THAN 2000.**

```
SELECT name as Procedure_Name,cost as Procedure_Cost  
FROM procedures  
WHERE cost > 2000;
```

Procedure_Name	Procedure_Cost
MRI-Brain	5000
MRI-Spine	6000
CT Scan-Abdomen	3000
CT Scan-Pelvis	3500
Ultrasound-Obstetric	2500
PET-CT Scan	5000
Fluoroscopy - Upper GI Series	7000
Fluoroscopy - Barium Enema	4500
MRI-Knee	4000

**Q7. WRITE A QUERY TO UPDATE THE NAME OF THE PATIENT TO ROBERT FERNANDEZ HAVING PATIENTID AS 5.**

```
UPDATE patient
SET name = 'Robert', surname = 'Fernandez'
WHERE PATIENT_ID = 5;

SELECT * FROM patient where patient_id= 5 ;
```

patient_id	name	surname	address	Gender	primary_check
5	Robert	Fernandez	123 Main St	Male	24
NULL	NULL	NULL	NULL	NULL	NULL

## Q8. WRITE A QUERY TO DROP PHONE COLUMN FROM PATIENT TABLE.

```
ALTER TABLE Patient  
DROP phone;  
  
SELECT * FROM PATIENT;
```

patient_id	name	surname	address	Gender	primary_check
1	John	Smith	42 Foobar Lane	Male	2
2	Grace	Ritchie	37 Snafu Drive	Female	2
3	Remo	Xavier	101 Omgbqq Street	Male	9
4	Dennis	Doe	1100 Foobaz Avenue	Male	17
5	Robert	Fernandez	123 Main St	Male	24
6	Emily	Johnson	56 Elm St	Female	7
7	Michael	Williams	789 Oak St	Male	13

## Q9. FIND THE SECOND MAXIMUM COST OF MEDICAL PROCEDURE

```
SELECT name,MAX(cost) as Procedure_cost  
FROM procedures  
GROUP BY name  
ORDER BY Procedure_cost DESC  
LIMIT 1,1;
```

name	Procedure_cost
MRI-Spine	6000

## Q10. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PATIENTS STARTING WITH LETTER A.

```
SELECT CONCAT(name, ' ', surname) AS FULL_NAME, gender  
FROM patient  
WHERE CONCAT(name, ' ', surname) LIKE 'A%';
```

FULL_NAME	gender
Ashley Taylor	Female
Amanda Hernandez	Female
Andrew Cruz	Male
Austin Green	Male

## Q11. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PATIENTS WHOSE THIRD LETTER IS M.

```
SELECT CONCAT(name, ' ', surname) AS FULL_NAME, gender  
FROM patient  
WHERE CONCAT(name, ' ', surname) LIKE '_m%';
```

FULL_NAME	gender
Remo Xavier	Male
Samantha Anderson	Female
James Lopez	Male

**Q12. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PATIENTS WHOSE NAME START WITH LETTER J AND ENDS WITH Z.**

```
SELECT CONCAT(name, ' ', surname) AS FULL_NAME, gender  
FROM patient  
WHERE CONCAT(name, ' ', surname) LIKE 'j%z';
```

FULL_NAME	gender
James Lopez	Male
Jennifer Gonzalez	Female
Joshua Perez	Male

### Q13. WRITE A QUERY TO OBTAIN PATIENT DETAILS HAVING PATIENT\_ID 11 TO 20.

```
SELECT *
FROM patient
WHERE patient_id between 11 and 20;
```

patient_id	name	surname	address	Gender	primary_check
11	Christopher	Wilson	890 Birch St	Male	5
12	Ashley	Taylor	111 Walnut St	Female	33
13	Matthew	Martinez	222 Cherry St	Male	3
14	Samantha	Anderson	333 Spruce St	Female	18
15	Daniel	Garcia	444 Sycamore St	Male	6
16	Amanda	Hernandez	555 Pineapple St	Female	19
17	James	Lopez	666 Banana St	Male	15
18	Jennifer	Gonzalez	777 Orange St	Female	26
19	Joshua	Perez	888 Grape St	Male	6
20	Brittany	Torres	999 Lemon St	Female	20
NULL	NULL	NULL	NULL	NULL	NULL

**Q14. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PHYSICIANS WHO ARE THE HEAD OF EACH DEPARTMENT**

```
SELECT p.name AS Doctor_name,d.dept_name  
FROM physician p  
INNER JOIN department d  
ON p.employeeid = d.head;
```

Doctor_name	dept_name
Dr.Perdival Cox	General Medicine
Dr.John Wen	Surgery
Dr.Molly Clock	Psychiatry
Dr.Nancy James	Cardiology
Dr.Imani Harper	Nephrology
Dr.Robert Suarez	Urology
Dr.Ariya Bradley	Neurology
Dr.Nico Galvan	Physiotherapy
Dr.Mabel Leal	ENT
Dr.Bob Kelso	Pulmonology
Dr.Beth Gandy	Obstetrics

**Q15. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PATIENTS WITH THEIR PHYSICIANS BY WHOM THEY GOT THEIR PRELIMINARY TREATMENT**

```
SELECT CONCAT(p.name, ' ', p.surname) AS patient_name, ph.NAME AS Pri_Treatment  
FROM patient p  
LEFT JOIN physician ph  
ON p.primary_check = ph.employeeid;
```

patient_name	Pri_Treatment
John Smith	Dr.Elliot Reid
Grace Ritchie	Dr.Elliot Reid
Remo Xavier	Dr.Molly Clock
Dennis Doe	Dr.Rosalie Vaughn
Robert Fernandez	Dr.Gavin Curtis
Emily Johnson	Dr.John Wen
Michael Williams	Dr.Nancy James
Sarah Brown	Dr.Alexis Estes
David Jones	Dr.Dallas Gutierrez
Jessica Davis	Dr.Aaliyah Craig
Christopher Wilson	Dr.Bob Kelso
Ashley Taylor	Dr.Jamison Clayton
Matthew Martinez	Dr.Christopher Turk
Samuel Clark	Dr.Samantha Clark

**Q16. WRITE A QUERY IN SQL TO OBTAIN THE NAME OF THE PHYSICIAN WITH THE DEPARTMENT WHO ARE DONE WITH AFFILIATION.**

```
select p.name as physician_name,d.dept_name as department_name,primaryaffiliation  
from physician p  
inner join affiliated_with a  
on p.employeeid = a.physicianid  
inner join department d  
on a.departmentid = d.department_id  
where primaryaffiliation='t';
```

physician_name	department_name	primaryaffiliation
Dr.John Dorian	General Medicine	t
Dr.Elliott Reid	General Medicine	t
Dr.Christopher Turk	Surgery	t
Dr.Percival Cox	General Medicine	t
Dr.Bob Kelso	Pulmonology	t
Dr.Todd Quinlan	Surgery	t
Dr.John Wen	Surgery	t
Dr.Keith Dudemeister	General Medicine	t
Dr.Molly Clock	Psychiatry	t
Dr.Imani Harper	Nephrology	t
Dr.Scott Vaughan	Gynecology	t
Dr.Nancy James	Cardiology	t
Dr.Mabel Leal	ENT	t

## Q17. WRITE A QUERY TO OBTAIN PHYSICIAN NAME, POSITION AND DEPARTMENT THEY ARE AFFILIATED WITH.

```
SELECT p.name AS physician_name, p.position AS physician_position, d.dept_name AS department_name  
FROM Physician p  
JOIN affiliated_with a  
ON p.employeeid = a.physicianid  
JOIN department d  
ON a.departmentid = d.department_id;
```

physician_name	physician_position	department_name
Dr. John Dorian	Staff Internist	General Medicine
Dr. Elliot Reid	Attending Physician	General Medicine
Dr. Christopher Turk	Surgical Attending Physician	General Medicine
Dr. Percival Cox	Senior Attending Physician	General Medicine
Dr. John Wen	Surgical Attending Physician	General Medicine
Dr. Keith Dudemeister	Resident	General Medicine
Dr. Christopher Turk	Surgical Attending Physician	Surgery
Dr. Todd Quinlan	Surgical Attending Physician	Surgery
Dr. John Wen	Surgical Attending Physician	Surgery
Dr. Molly Clock	Attending Psychiatrist	Psychiatry
Dr. Berkley McKenzie	Resident	Cardiology
Dr. Nancy James	Cardiologist	Cardiology
Dr. Willow Farmer	Junior Resident	Cardiology
Dr. Imani Harper	Senior Attending Nephrologist	Nephrology

## Q18. WRITE A QUERY IN SQL TO OBTAIN THE PATIENT NAME FROM WHICH PHYSICIAN THEY GET PRIMARY\_CHECKUP AND ALSO MENTION THE PATIENT DIAGNOSIS WITH PRESCRIPTION.

```
SELECT ph.employeeid ,PH.NAME AS Physician_Name,PH.POSITION AS Designation,P.PATIENT_ID,CONCAT(P.NAME,' ',P.SURNAME) AS Patient_treated,P.GENDER,PD.DIAGNOSIS,PD.PRESCRIPTION  
FROM patient_diagnosis pd  
LEFT JOIN Physician ph  
ON pd.Physician_id = ph.employeeid  
LEFT JOIN patient P  
ON P.patient_id = PD.patient_id;
```

employeeid	Physician_Name	Designation	PATIENT_ID	Patient_treated	GENDER	DIAGNOSIS	PRESCRIPTION
2	Dr.Elliot Reid	Attending Physician	1	John Smith	Male	Hypertension	Lisinopril
17	Dr.Rosalie Vaughn	Assistant Orthopedic Surgeon	4	Dennis Doe	Male	Arthritis	Naproxen & Aspirin
9	Dr.Molly Clock	Attending Psychiatrist	3	Remo Xavier	Male	Anxiety Disorder	Fluoxetine
24	Dr.Gavin Curtis	Assistant Physiotherapist	5	Robert Fernandez	Male	Muscular Dystrophy	Corticosteroids
2	Dr.Elliot Reid	Attending Physician	2	Grace Ritchie	Female	Asthma	Albuterol
10	Dr.Imani Harper	Senior Attending Nephrologist	30	Kayla Adams	Female	IgA Nephropathy	Budesonide
7	Dr.John Wen	Surgical Attending Physician	6	Emily Johnson	Female	Chronic Pain	Tramadol
13	Dr.Nancy James	Cardiologist	7	Michael Williams	Male	Acoustic neuroma	Radiation therapy
25	Dr.Alexander Foster	Senior Endocrinologist	8	Sarah Brown	Female	Seizure disorder	Corticosteroids/Budesonide

**Q19. WRITE A QUERY IN SQL TO OBTAIN THE MAXIMUM COST OF THE MEDICAL PROCEDURE.**

```
SELECT name,cost FROM procedures  
WHERE cost IN (SELECT MAX(cost) FROM procedures);
```

name	cost
Fluoroscopy - Upper GI Series	7000

## Q20. WRITE A QUERY IN SQL TO OBTAIN THE DETAILS OF PATIENT WHO HAS DIAGNOSED WITH CHRONIC PAIN.

```
SELECT * FROM Patient  
WHERE patient_id IN (SELECT Patient_ID FROM patient_diagnosis WHERE Diagnosis = 'Chronic Pain');
```

patient_id	name	surname	address	Gender	primary_check
6	Emily	Johnson	56 Elm St	Female	7
13	Matthew	Martinez	222 Cherry St	Male	3
NULL	NULL	NULL	NULL	NULL	NULL

**Q21. WRITE A QUERY IN SQL TO OBTAIN THE PROCEDURE NAME AND COST WHOSE COST IS GREATER THAN THE AVG COST OF ALL THE PROCEDURE.**

```
SELECT name as Procedure_name,cost as Procedure_cost  
FROM procedures  
WHERE cost > (SELECT AVG(cost) FROM procedures);
```

Procedure_name	Procedure_cost
MRI-Brain	5000
MRI-Spine	6000
CT Scan-Abdomen	3000
CT Scan-Pelvis	3500
PET-CT Scan	5000
Fluoroscopy - Upper GI Series	7000
Fluoroscopy - Barium Enema	4500
MRI-Knee	4000

**Q22. WRITE A QUERY IN SQL TO OBTAIN THE PROCEDURE NAME AND COST WHOSE COST IS LESS THAN THE AVG COST OF ALL THE PROCEDURE.**

```
SELECT name as Procedure_name,cost as Procedure_cost  
FROM procedures  
WHERE cost < (SELECT AVG(cost) FROM procedures);
```

Procedure_name	Procedure_cost
X-ray-Chest	1000
X-ray-Abdomen	1200
X-ray-Skull	900
X-ray-Spine	1500
Ultrasound-Abdomen	700
Ultrasound-Obstetric	2500
Mammogram	1200
Bone Density Scan (DEXA)	1800
Nuclear Medicine - Thyroid Scan	450
Angiography - Cerebral	800
Interventional Radiology - Biopsy	700
X-ray-Extremities	300

**Q23. WRITE A QUERY IN SQL TO OBTAIN THE PHYSICIAN NAME WHO ARE EITHER HEAD CHIEF OR SENIOR IN THEIR RESPECTIVE DEPARTMENT.**

```
SELECT *
FROM Physician
WHERE position IN (SELECT position FROM Physician
                    WHERE position
                    LIKE '%Senior%' OR position LIKE '%Head Chief%'
                    );
```

employeeid	name	position
4	Dr.Percival Cox	Senior Attending Physician
5	Dr.Bob Kelso	Head Chief of pulmonology
10	Dr.Imani Harper	Senior Attending Nephrologist
12	Dr.Scott Vaughan	Senior Attending Gynecologist
15	Dr.Mabel Leal	Senior ENT Surgeon
18	Dr.Remy Cook	Head chief of Gastroenterology
21	Dr.Cali Vazquez	Head Chief of Orthopedics
22	Dr.Jesse Craig	Head chief of neonatal
25	Dr.Alexis Estes	Senior Intensivist
27	Dr.Nico Galvan	Head chief of physiotherapy
28	Dr.Dallas Gutierrez	Senior attending Urologist
30	Dr.Ariya Bradley	Senior Attending Neurologist
31	Dr.Richard Mitchell	Senior Resident

**Q24. WRITE A QUERY IN SQL TO OBTAIN THE EMPLOYEEID, PHYSICIAN NAME AND POSITION WHOSE PRIMARY AFFILIATION HAS NOT BEEN DONE.02:06 AM**

```
SELECT *
FROM Physician
WHERE employeeid IN (SELECT physicianid
                      FROM affiliated_with
                      WHERE primaryaffiliation = 'f'
                    );
```

employeeid	name	position
3	Dr. Christopher Turk	Surgical Attending Physician
7	Dr. John Wen	Surgical Attending Physician
11	Dr. Berkley McKenzie	Resident
14	Dr. Jaxson Khan	Assistant Intensivist
16	Dr. Cedric Kelley	Junior Resident
20	Dr. Odin Banks	Junior Intensivist
23	Dr. Brynn Harrison	Staff Internist
26	Dr. Estella Keller	Assistant Gastro Surgeon
31	Dr. Richard Mitchell	Senior Resident
32	Dr. Willow Farmer	Junior Resident
NUL	NUL	NUL

# THANK YOU

