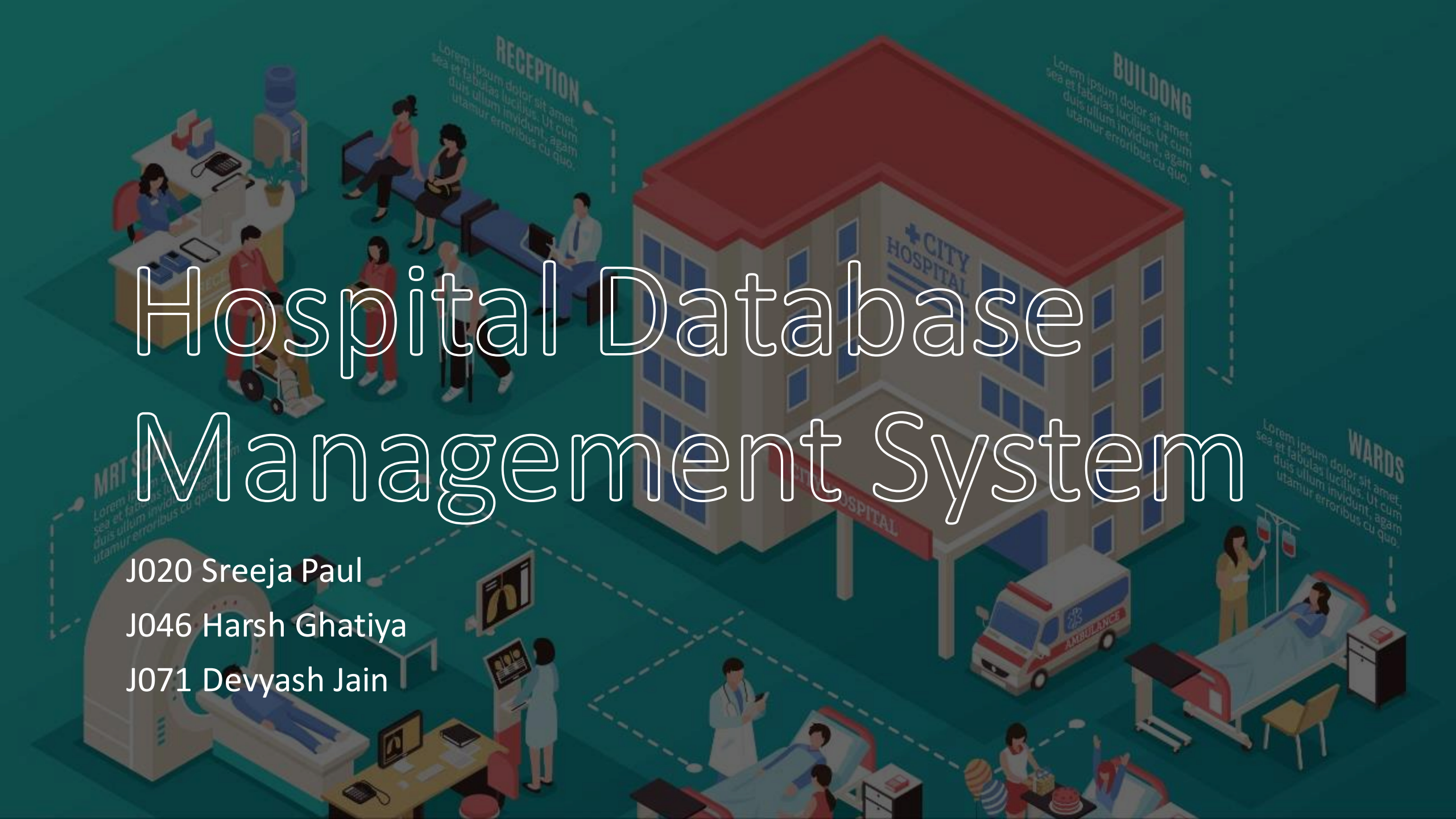

Hospital Database Management System

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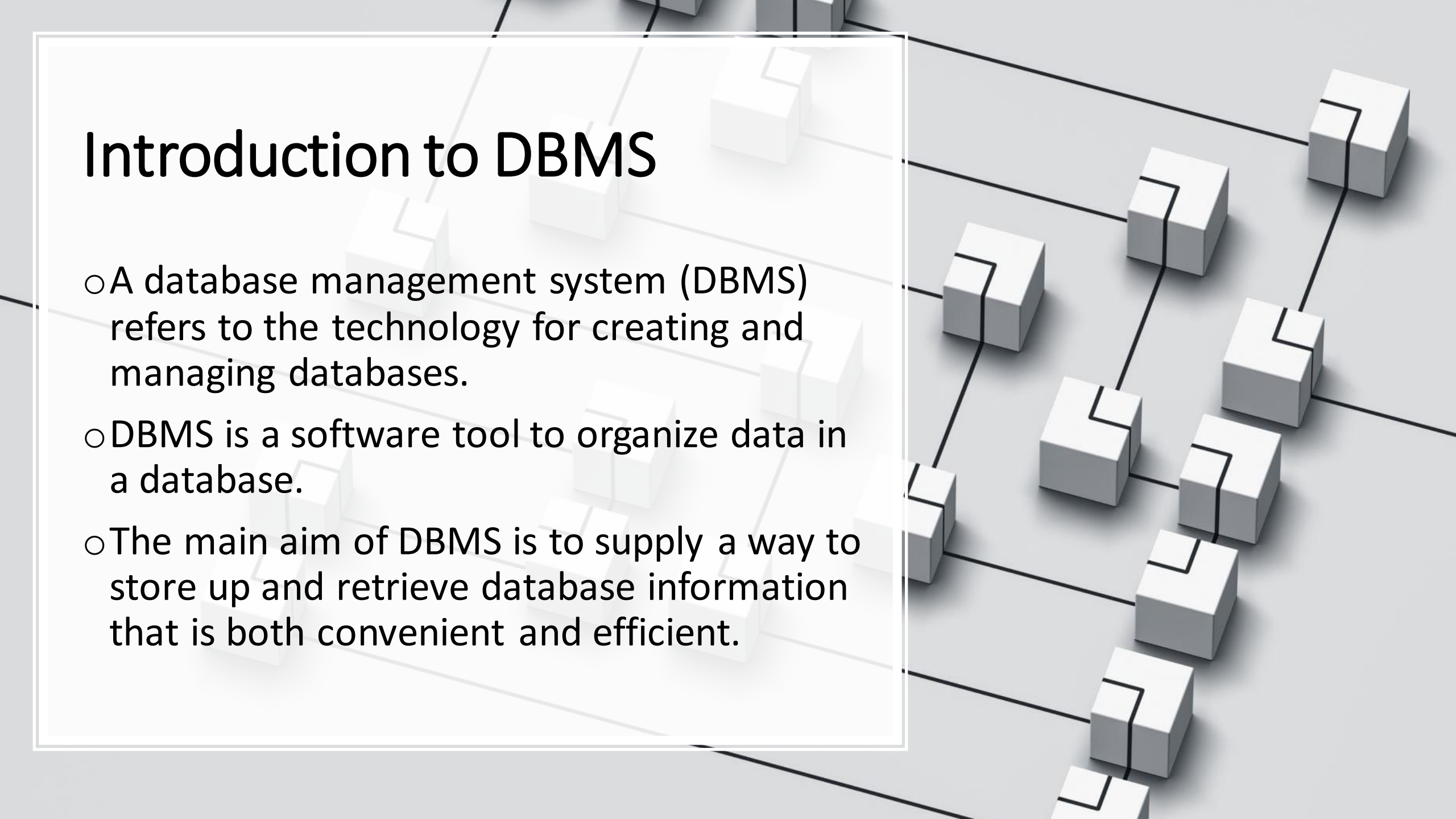
J046 Harsh Ghatiya

J071 Devyash Jain

Introduction to DBMS

- A database management system (DBMS) refers to the technology for creating and managing databases.
- DBMS is a software tool to organize data in a database.
- The main aim of DBMS is to supply a way to store up and retrieve database information that is both convenient and efficient.



Hospital Database Management Systems

Hospital database systems provide multifaceted support for the diagnosis, treatment and follow-up of diseases and their management. On a hospital database every process and all data are safely recorded and stored.

Examination, medication, surgery and hospitalization reports and all the health institution’s records are kept together with the finest detail about patients, and the patient is asked to re-enter each time on his/her application.

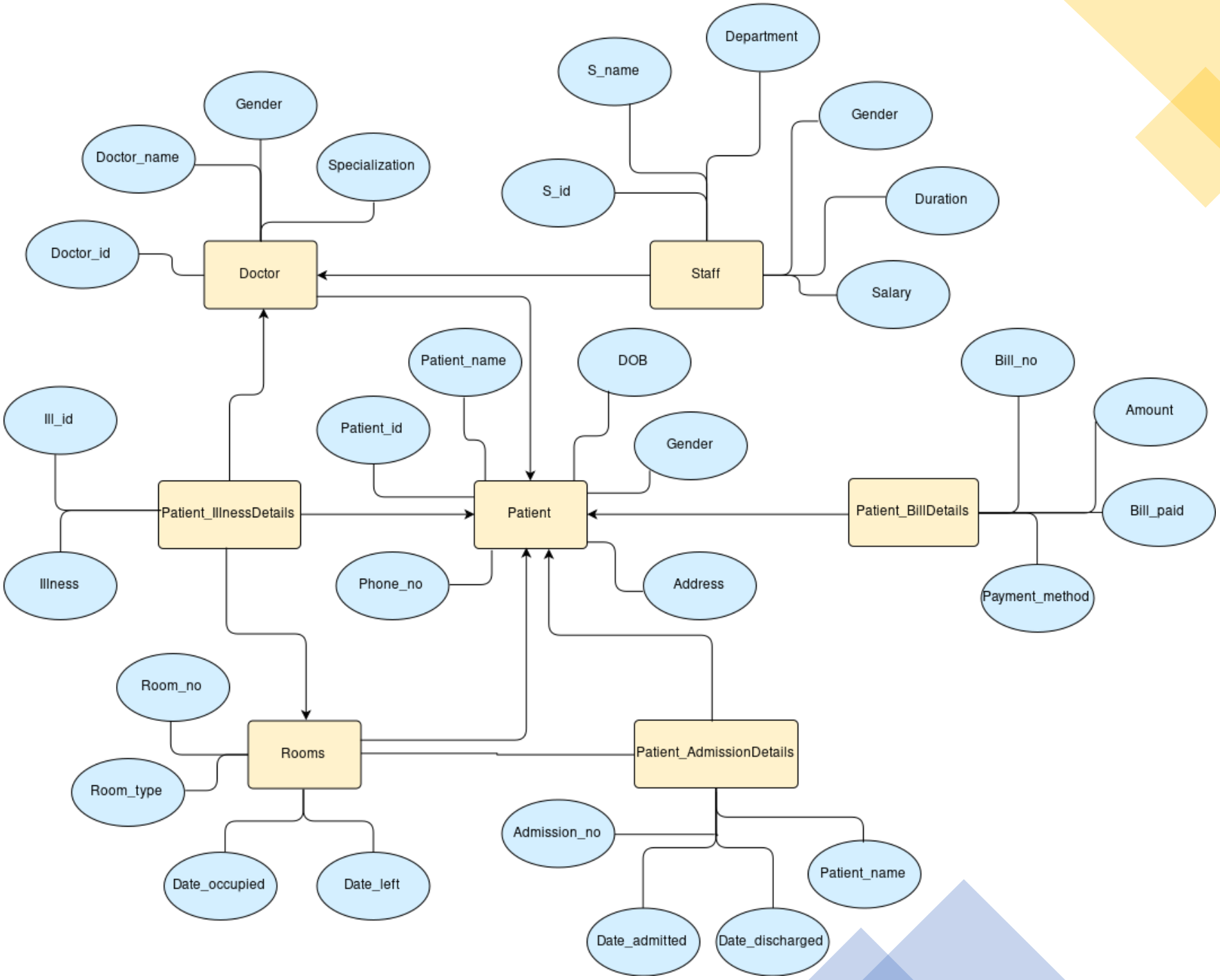
Why Use Hospital Database Management Systems?

- Databases in healthcare sectors provide a proper system for storing, organizing, and managing critical health statistics such as labs, finances, billing and payments, patient identification, and more.
- Moreover, it’s crucial for doctors, providers, and management teams to access in-depth health data quickly and without error.
- Healthcare operations, from large-scale to individual processes, depending on the accuracy and efficiency of healthcare databases.

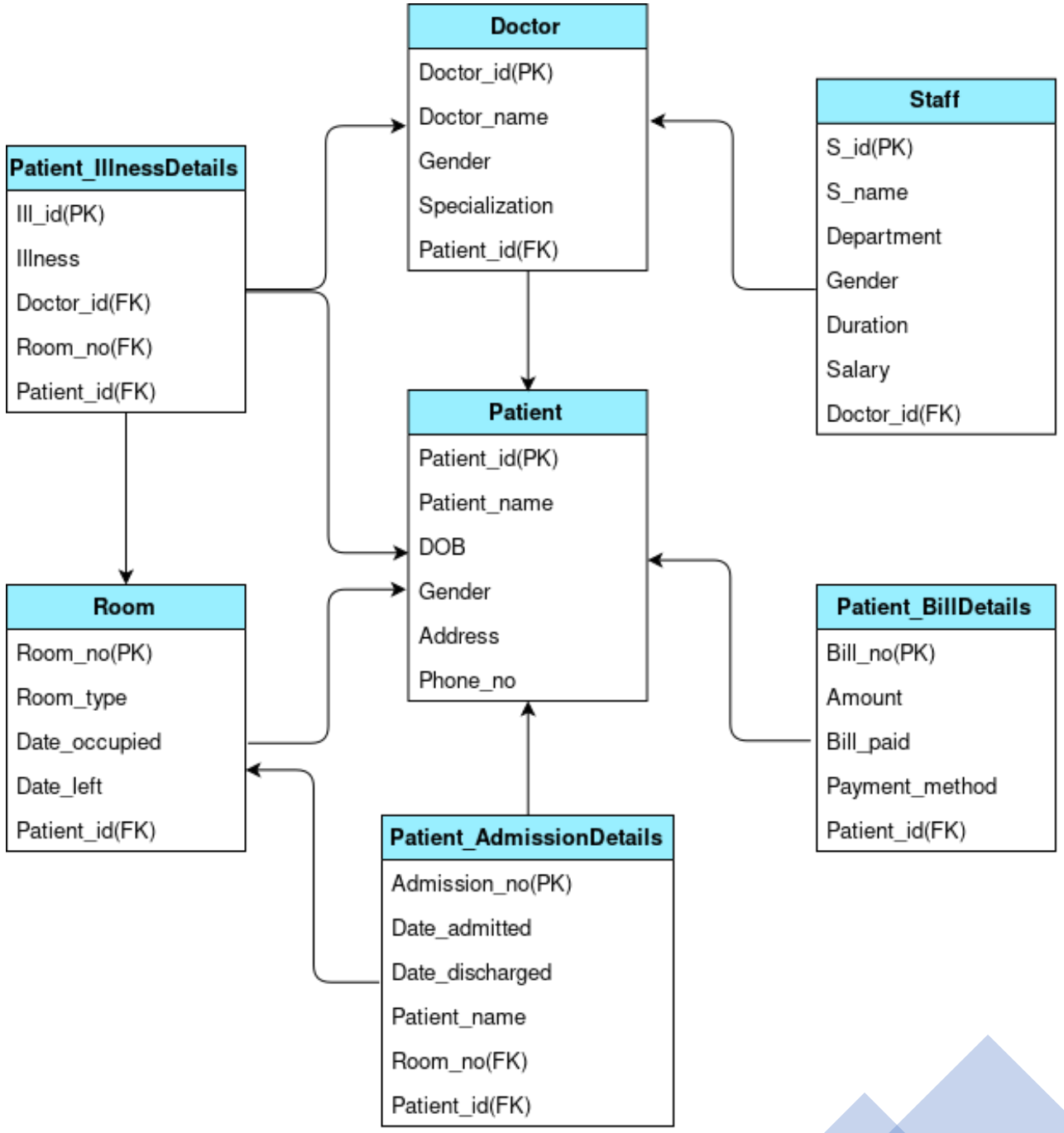
Entity Sets & Attributes

- Doctor- Doctor_id ,Doctor_Name, Gender, Specialisation
- Staff- S_id, S_name, Department, Gender, Duration, Salary
- Patient- Patient_id, Patient_name, DOB, Gender, Address, Phone_no
- Rooms- Room_no, Room_type, Date_Occupied, Date_Left
- Patient_AdmissionDetails- Admission_no, Patient_name, Date_Admitted, Date_Discharged
- Patient_BillDetails- Bill_no, Patient_id, Amount, Bill_paid, Payment_method
- Patient_IllnessDetails- Ill_id, Illness

ER DIAGRAM


Department
S_name
Gender
Gender
Doctor_name
Specialization
S_id
Duration
Doctor_id
Doctor
Staff
Salary
Patient_name
DOB
Bill_no
Ill_id
Amount
Patient_id
Gender
Patient_IllnessDetails
Patient
Patient_BillDetails
Bill_paid
Illness
Phone_no
Address
Payment_method
Room_no
Rooms
Patient_AdmissionDetails
Room_type
Admission_no
Patient_name
Date_occupied
Date_left
Date_admitted
Date_discharged

SCHEMA


Doctor
Doctor_id(PK)
Doctor_name
Gender
Specialization
Patient_id(FK)
Staff
S_id(PK)
S_name
Department
Gender
Duration
Salary
Doctor_id(FK)
Patient_IllnessDetails
Ill_id(PK)
Illness
Doctor_id(FK)
Room_no(FK)
Patient_id(FK)
Patient
Patient_id(PK)
Patient_name
DOB
Gender
Address
Phone_no
Room
Room_no(PK)
Room_type
Date_occupied
Date_left
Patient_id(FK)
Patient_BillDetails
Bill_no(PK)
Amount
Bill_paid
Payment_method
Patient_id(FK)
Patient_AdmissionDetails
Admission_no(PK)
Date_admitted
Date_discharged
Patient_name
Room_no(FK)
Patient_id(FK)

Patient

	Column	Type
	PATIENT_ID	VARCHAR2
	PATIENT_NAME	VARCHAR2
	DOB	DATE
	GENDER	VARCHAR2
	ADDRESS	VARCHAR2
	PHONE_NO	NUMBER

Patient_Bill Details

#	Column	Type
1	BILL_NO	VARCHAR2
2	PATIENT_ID	VARCHAR2
3	AMOUNT	NUMBER
4	BILL_PAID	DATE
5	PAYMENT_METHOD	VARCHAR2

Patient_AdmissionDetails

#	Column	Type
1	ADMISSION_NO	NUMBER
2	PATIENT_ID	VARCHAR2
3	PATIENT_NAME	VARCHAR2
4	DATE_ADMITTED	DATE
5	DATE_DISCHARGED	DATE
6	ROOM_NO	NUMBER

Doctor

#	Column	Type
1	DOCTOR_ID	VARCHAR2
2	DOCTOR_NAME	VARCHAR2
3	GENDER	VARCHAR2
4	SPECIALISATION	VARCHAR2

Patient_IllnessDetails

#	Column	Type
1	ILL_ID	VARCHAR2
2	PATIENT_ID	VARCHAR2
3	ILLNESS	VARCHAR2
4	DOCTOR_ID	VARCHAR2
5	ROOM_NO	NUMBER

Room

#	Column	Type
1	ROOM_NO	NUMBER
2	ROOM_TYPE	VARCHAR2
3	DATE_OCCUPIED	DATE
4	DATE_LEFT	DATE
5	PATIENT_ID	VARCHAR2

Staff

#	Column	Type
1	S_ID	NUMBER
2	S_NAME	VARCHAR2
3	DEPARTMENT	VARCHAR2
4	GENDER	VARCHAR2
5	DURTION	VARCHAR2
6	SALARY	NUMBER

VIEWS

Doctor

Primary Key- Doctor_id

```
CREATE TABLE Doctor(
Doctor_id varchar(50),
Doctor_Name varchar(50),
gender varchar(20) ,
Specialisation varchar (100),
PRIMARY KEY (Doctor_id));
```

DOCTOR_ID	DOCTOR_NAME	GENDER	SPECIALISATION
D001	Dr.Ross	M	Cardiologists
D002	Dr.Mary	F	Oncologists
D003	Dr.Abbots	F	MBBS
D004	Dr.Paul	F	Neurologists
D005	Dr.Rose	M	Orthopedic

Staff

Primary Key – S_id

```
CREATE TABLE Staff (
S_id int,
S_name varchar(50),
Department varchar(50),
Gender varchar(50),
Durtion varchar(100),
Salary int,
Primary key (S_id));
```

S_ID	S_NAME	DEPARTMENT	GENDER	DURTION	SALARY
1001	John	Recording staff	M	Full time	35000
1002	Lara	Recording staff	F	Full time	35000
1003	Kate	Recording staff	F	Part time	25000
1004	Ross	Recording staff	M	Part time	25000
1005	Benny	Recording staff	F	Part time	25000
2001	Noah	Receptitionist	M	Full time	27000
2002	Emily	Receptitionist	F	Part time	19000
2003	Amelia	Receptitionist	F	Full time	25000
2004	Sophia	Receptitionist	F	Part time	18000
2005	Etha	Receptitionist	F	Part time	17000
2006	Emma	Receptition	F	Full time	30000
3001	Jessica	Nurse	F	Full time	20000
3002	Selina	Nurse	F	Part time	13000
3003	Sam	Nurse	M	Full time	17000
3004	Daniel	Nurse	M	Full time	20000
3005	David	Nurse	M	Part time	15500
3006	Thomas	Nurse	M	Part time	11500
3007	Jack	Nurse	M	Full time	19000
3008	Elizabeth	Nurse	F	Part time	13500

Patient

Primary Key- Patient_id

```
CREATE TABLE Patient (
Patient_id varchar(50) ,
Patient_name varchar(100),
DOB date,
gender varchar(100),
address varchar(100),
Phone_no int,
PRIMARY KEY (Patient_id));
```

PATIENT_ID	PATIENT_NAME	DOB	GENDER	ADDRESS	PHONE_NO
P001	Andrew	04-SEP-67	M	CA	6595004000
P002	Sarah	05-DEC-54	F	CA	6595004741
P003	Robert	06-JUN-85	M	CA	6595004963
P004	Kat	07-AUG-67	F	CA	6595004225
P005	Nate	05-JUL-91	M	CA	6595004321
P006	Adem	08-SEP-78	M	CA	6595004453
P007	Jacob	13-APR-81	M	CA	6595004896
P008	Richard	03-SEP-91	M	CA	659508959
P009	Tessa	12-JUN-33	F	CA	6595004561
P010	Lara	02-DEC-56	F	CA	6595004569

Rooms

Primary Key- Room_no

```
CREATE TABLE Rooms (
Room_no int,
Room_type varchar(100),
Date_Occupied date,
Date_Left date,
Patient_id varchar(50) ,
PRIMARY KEY (Room_no),
foreign key (Patient_id) references Patient
(Patient_id));
```

ROOM_NO	ROOM_TYPE	DATE_OCCUPIED	DATE_LEFT	PATIENT_ID
201	Public	04-SEP-12	13-SEP-12	P001
501	Private	08-APR-12	05-MAY-12	P002
502	Priavte	04-JUN-12	15-JUN-12	P003
401	Private	07-MAR-12	25-MAR-12	P004
202	Public	02-DEC-12	06-DEC-12	P005
503	Private	13-MAR-12	18-MAR-12	P006
204	Public	04-MAR-12	07-APR-12	P007
402	Private	02-FEB-12	09-FEB-12	P008
203	Public	05-MAY-12	23-MAY-12	P009
403	Private	12-DEC-12	31-DEC-12	P010

Patient_AdmissionDetails

Primary Key- Admission_no

```
CREATE TABLE Patient_AdmissionDetails(
Admission_no int,
Patient_id VARCHAR(50) ,
Patient_name varchar(50),
Date_Admitted date,
Date_Discharged date,
Room_no int,
PRIMARY KEY (Admission_no),
foreign key (Patient_id) references Patient
(Patient_id),
foreign key (Room_no) references Rooms
(Room_no));
```

ADMISSION_NO	PATIENT_ID	PATIENT_NAME	DATE_ADMITTED	DATE_DISCHARGED	ROOM_NO
1	P001	Andrew	04-SEP-12	13-SEP-12	201
2	P002	Sarah	08-APR-12	05-MAY-12	501
3	P003	Robert	04-JUN-12	15-JUN-12	502
4	P004	Kat	07-MAR-12	25-MAR-12	401
5	P005	Nate	02-DEC-12	06-DEC-12	202
6	P006	Adem	13-MAR-12	18-MAR-12	503
7	P007	Jacob	04-MAR-12	07-APR-12	204
8	P008	Richard	02-FEB-12	09-FEB-12	402
9	P009	Tessa	05-MAY-12	23-MAY-12	203
10	P010	Lara	12-DEC-12	31-DEC-12	403

Patient_BillDetails

Primary Key- Bill_no

```
CREATE TABLE Patient_BillDetails(
Bill_no varchar(50),
Patient_id varchar(50) ,
Amount int,
Bill_paid date,
Payment_method varchar(50),
PRIMARY KEY (Bill_no),
foreign key (Patient_id) references Patient
(Patient_id));
```

BILL_NO	PATIENT_ID	AMOUNT	BILL_PAID	PAYMENT_METHOD
B01	P001	20000	04-SEP-67	Cash
B02	P002	25000	05-DEC-54	Credit Card
B03	P003	120000	06-JUN-85	Cash
B04	P004	110000	07-AUG-67	Cheque
B05	P005	10000	05-JUL-91	Debit Card
B06	P006	100000	08-SEP-78	Cheque
B07	P007	80000	13-APR-81	Credit Card
B08	P008	110000	03-SEP-91	Debit Card
B09	P009	20000	12-JUN-33	Cash
B010	P010	120000	02-DEC-56	Cash

Patient_IllnessDetails

Primary Key- Ill_id

```
CREATE TABLE Patient_IllnessDetails(
Ill_id varchar(50),
Patient_id varchar(50),
Illness varchar(100),
Doctor_id varchar(50),
Room_no int,
PRIMARY KEY (Ill_id),
foreign key (Patient_id) references Patient
(Patient_id),
foreign key (Doctor_id) references Doctor (Doctor_id),
foreign key (Room_no) references RoomS (Room_no));
```

ILL_ID	PATIENT_ID	ILLNESS	DOCTOR_ID	ROOM_NO
I001	P001	Malaria	D003	201
I002	P002	Bone injury	D005	501
I003	P003	Cancer	D002	502
I004	P004	Heart attack	D001	401
I005	P005	Dengue	D003	202
I006	P006	Head injury	D004	503
I007	P007	Accident	D003	204
I008	P008	Heart attack	D001	402
I009	P009	Dengue	D003	203
I010	P010	Cancer	D002	403

SQL CONSTRAINTS

Constraints are the rules enforced on the data columns of a table. These are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database.

Types of Constraints:

- NOT NULL Constraint.
- DEFAULT Constraint.
- UNIQUE Constraint.
- PRIMARY KEY Constraint.
- FOREIGN KEY Constraint.
- CHECK Constraint.

SQL QUERIES

Q1 List of patients admitted on a particular date.

```
SELECT Patient_id, Patient_name
FROM Patient
NATURAL JOIN Patient_AdmissionDetails
WHERE Date_Admitted = date'2012-09-04'
```

PATIENT_ID	PATIENT_NAME
P001	Andrew

Q2 Find the Patient name and id who has illness 'Cancer'.

```
SELECT Patient_id, Patient_name
FROM Patient
NATURAL JOIN Patient_IllnessDetails
WHERE Illness = 'Cancer'
```

PATIENT_ID	PATIENT_NAME
P003	Robert
P010	Lara

Q3 Find the Nurse with Max Salary.

```
SELECT S_id, S_name, Salary
from Staff
WHERE Salary
IN (Select MAX (Salary) FROM Staff WHERE Department = 'Nurse')
```

S_ID	S_NAME	SALARY
3001	Jessica	20000
3004	Daniel	20000

Q4 Display specialization of a doctor using doctor ID where name = 'Dr.Rose'

```
SELECT Specialisation
FROM Doctor
WHERE Doctor_id
IN (SELECT Doctor_id FROM Doctor WHERE Doctor_name = 'Dr.Rose')
```

SPECIALISATION
Orthopedic

```
INSERT INTO Staff Values (3009,'Pep','Nurse','M','Full time',19500)
```

Q5 Add a new Staff named Pep, ID 3009, Department nurse, Gender male, Duration Full time, Salary 19500.

```
SELECT * FROM Staff
```

S_ID	S_NAME	DEPARTMENT	GENDER	DURTION	SALARY
1001	John	Recording staff	M	Full time	35000
1002	Lara	Recording staff	F	Full time	35000
1003	Kate	Recording staff	F	Part time	25000
1004	Ross	Recording staff	M	Part time	25000
1005	Benny	Recording staff	F	Part time	25000
2001	Noah	Receptitionist	M	Full time	27000
2002	Emily	Receptitionist	F	Part time	19000
2003	Amelia	Receptitionist	F	Full time	25000
2004	Sophia	Receptitionist	F	Part time	18000
2005	Etha	Receptitionist	F	Part time	17000
2006	Emma	Receptition	F	Full time	30000
3001	Jessica	Nurse	F	Full time	20000
3002	Selina	Nurse	F	Part time	13000
3003	Sam	Nurse	M	Full time	17000
3004	Daniel	Nurse	M	Full time	20000
3005	David	Nurse	M	Part time	15500
3006	Thomas	Nurse	M	Part time	11500
3007	Jack	Nurse	M	Full time	19000
3008	Elizabeth	Nurse	F	Part time	13500
3009	Pep	Nurse	M	Full time	19500

Q6 Patient paying highest bill.

```
SELECT Patient_id
FROM Patient_BillDetails
WHERE Amount
IN (select MAX (Amount)FROM Patient_BillDetails )
```

PATIENT_ID
P003
P010

Q7 Name of Patient_id in room number = 201 AND Doctor_id for patient in room no. 201.

```
SELECT Patient_id FROM ROOMS WHERE Room_no = 201
UNION
SELECT Doctor_id FROM Patient_IllnessDetails WHERE Room_no = 201
```

PATIENT_ID
D003
P001

Q8 List the details of the Patient who belong to the Room_no 201 and Patient_id 'P001' .

```
SELECT *
FROM Patient_AdmissionDetails
WHERE Room_no = 201 AND Patient_id = 'P001'
```

ADMISSION_NO	PATIENT_ID	PATIENT_NAME	DATE_ADMITTED	DATE_DISCHARGED	ROOM_NO
1	P001	Andrew	04-SEP-12	13-SEP-12	201

Q9 Display Patient_id,Patient_name,Doctor_id, Doctor_name in reference to there illness.

```
SELECT P.Patient_id,P.Patient_name, D.Doctor_id, D.Doctor_name, I.Illness
from Patient_IllnessDetails I, Doctor D, Patient P
WHERE I.Patient_id = P.Patient_id AND  I.Doctor_id=D.Doctor_id
```

PATIENT_ID	PATIENT_NAME	DOCTOR_ID	DOCTOR_NAME	ILLNESS
P001	Andrew	D003	Dr.Abbots	Malaria
P002	Sarah	D005	Dr.Rose	Bone injury
P003	Robert	D002	Dr.Mary	Cancer
P004	Kat	D001	Dr.Ross	Heart attack
P005	Nate	D003	Dr.Abbots	Dengue
P006	Adem	D004	Dr.Paul	Head injury
P007	Jacob	D003	Dr.Abbots	Accident
P008	Richard	D001	Dr.Ross	Heart attack
P009	Tessa	D003	Dr.Abbots	Dengue
P010	Lara	D002	Dr.Mary	Cancer

Q10 Update phone no of patient with patient.id P005.

```
UPDATE Patient
SET Phone_no = 6678004321
Where Patient_id = 'P005'
```

```
SELECT * FROM Patient
```

PATIENT_ID	PATIENT_NAME	DOB	GENDER	ADDRESS	PHONE_NO
P001	Andrew	04-SEP-67	M	CA	6595004000
P002	Sarah	05-DEC-54	F	CA	6595004741
P003	Robert	06-JUN-85	M	CA	6595004963
P004	Kat	07-AUG-67	F	CA	6595004225
P005	Nate	05-JUL-91	M	CA	6678004321
P006	Adem	08-SEP-78	M	CA	6595004453
P007	Jacob	13-APR-81	M	CA	6595004896
P008	Richard	03-SEP-91	M	CA	659508959
P009	Tessa	12-JUN-33	F	CA	6595004561
P010	Lara	02-DEC-56	F	CA	6595004569

THANK YOU!