

Project Title: Healthcare Patient Records System

Goal:

Analyze existing data to find insights like average hospital stay, top diseases, doctor performance, billing trends,..,etc.

Why This Project

Hospitals continuously deal with thousands of patient records, doctor assignments, treatments, and insurance claims.

- They need **actionable insights** like:
 - Which diseases occur most frequently?
 - Which doctor/department has the best recovery rate?
 - What's the average cost per treatment?
 - What's the readmission rate (sign of care quality)?
- These insights directly help in **reducing costs, improving care, and managing resources.**
-  **Tables (Simple Names)**

No.	Table Name	Purpose	Key Fields
1	Patient	Stores patient personal and demographic details	PID (PK)
2	Doctor	Stores doctor details and specialization	DID (PK)
3	Appointment	Records patient admissions assigned to doctors	AID (PK), PID (FK), DID (FK)
4	Treatment	Records treatments given during an admission	TID (PK), AID (FK)
5	Billing	Stores billing details linked to patient and admission	BID (PK), PID (FK), AID (FK)

Table Details: What to Include in Each Table

1. Patient Table

• Columns:

- | | |
|-----------|------------------------------------|
| ◦ Pid | (Primary Key) ,Number |
| ◦ Pname | Varchar(30), Not null |
| ◦ Age | Number, Null |
| ◦ Gender | Varchar (10), Not null |
| ◦ Mno | Number(10) , Check(length(Mno)=10) |
| ◦ Address | Varchar(50), Null |

2. Department Table

- **Columns:**
 - Dno Primary key, Number
 - Dname Varchar(25)
 - Loc Varchar(10)

3. Doctor Table

- **Columns:**
 - Did Primary Key ,number
 - Dname varchar(30),not null
 - Dno foreign key, number
 - Spec varchar(20), not null
 - Mno number(10) , check(length(mno)=10)

4. Appointment Table

- **Columns:**
 - Aid Primary key, Number
 - Pid Foreign key, Number
 - Did Foreign key, Number
 - AppointDate Date
 - DischargeDate Date
 - Status Varchar(10)
(e.g., Recovered, Expired)

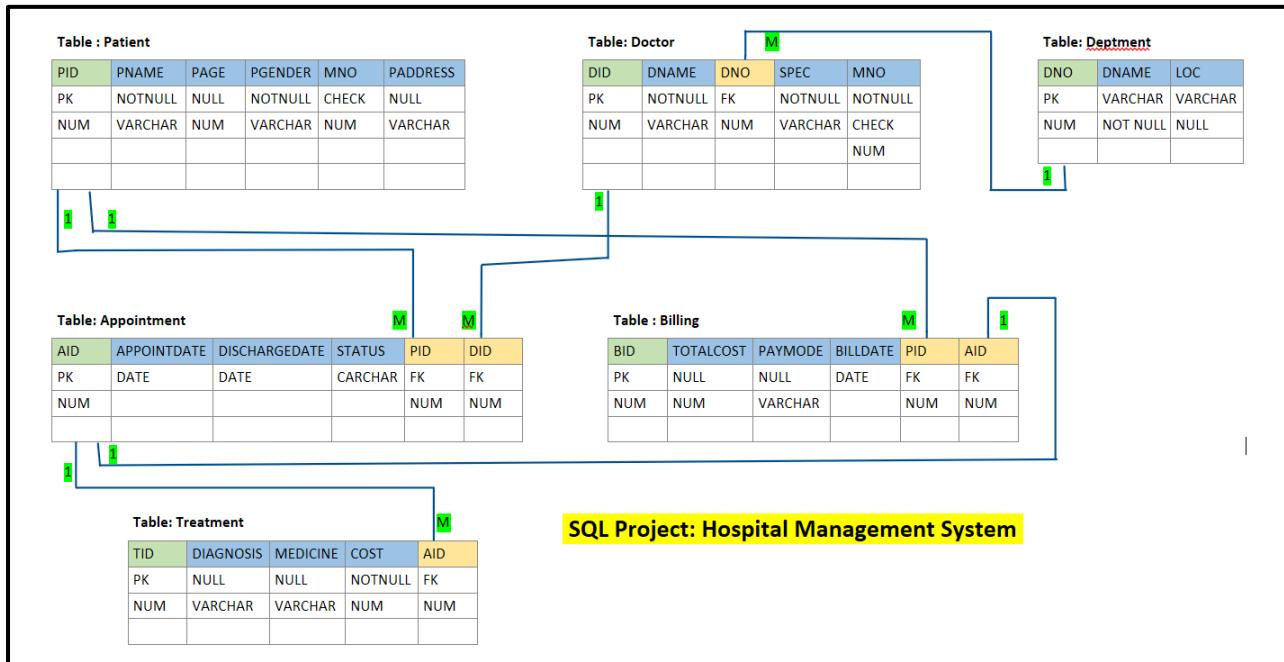
5. Billing Table

- **Columns:**
 - Bid Primary key, Number
 - Pid Foreign key, Number
 - Aid Foreign key ,Number
 - Totalcost Number, Null
 - Paymode Varchar(15), Null
 - BillDate Date

6. Treatment Table

- **Columns:**
 - Tid Primary key, Number
 - Diagosis varchar(25), Null
 - Aid Foreign key ,Number
 - Medicine Varchar(40), Null
 - Cost Number, Not null

Schema :



Relationships:

1. One department has many doctors (One-to-Many).
2. One doctor has many appointments (One-to-Many).
3. One patient has many appointments (One-to-Many).
4. One appointment has many treatments (One-to-Many).
5. One appointment has one billing (One-to-One).

Table Creation :

1. Patient Table

```
SQL> CREATE TABLE PATIENT
  2  (
  3    PID NUMBER ,
  4    PNAME VARCHAR(30) NOT NULL,
  5    AGE NUMBER NULL,
  6    GENDER VARCHAR(10) NOT NULL,
  7    HNO NUMBER(10) CHECK(LENGTH(HNO)=10),
  8    ADDRESS VARCHAR(50) NULL
  9  );

Table created.

SQL>
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'PATIENT';

OWNER          CONSTRAINT_NAME      C_TABLE_NAME      SEARCH_CONDITION
SCOTT          SVS_C005621           C_PATIENT        "PNAME" IS NOT NULL
SCOTT          SVS_C005622           C_PATIENT        "GENDER" IS NOT NULL
SCOTT          SVS_C005623           C_PATIENT        LENGTH(HNO)=10
```

```
SQL> ALTER TABLE PATIENT
  2  ADD CONSTRAINT PID_PK_PROJECT PRIMARY KEY(PID);

Table altered.

SQL>
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'PATIENT';

OWNER          CONSTRAINT_NAME      C_TABLE_NAME      SEARCH_CONDITION
SCOTT          SVS_C005621           C_PATIENT        "PNAME" IS NOT NULL
SCOTT          SVS_C005622           C_PATIENT        "GENDER" IS NOT NULL
SCOTT          SVS_C005623           C_PATIENT        LENGTH(HNO)=10
SCOTT          PID_PK_PROJECT       P_PATIENT        LENGTH(HNO)=10
```

2. Department Table

```
SQL>
SQL> CREATE TABLE DEPARTMENT
  2  (
  3    DNO NUMBER,
  4    DNAME VARCHAR(25) ,
  5    LOC VARCHAR(10),
  6    CONSTRAINTS DNO_PK_PROJECT PRIMARY KEY(DNO)
  7  );

Table created.

SQL>
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'DEPARTMENT';

OWNER          CONSTRAINT_NAME      C_TABLE_NAME      SEARCH_CONDITION
SCOTT          DNO_PK_PROJECT       P_DEPARTMENT     LENGTH(DNO)=10
```

3. Doctor Table

```
SQL>
SQL> CREATE TABLE DOCTOR
  2  (
  3    DID NUMBER,
  4    DNAME VARCHAR(30) NOT NULL,
  5    DNO NUMBER,
  6    SPEC VARCHAR(20) NOT NULL,
  7    MNO NUMBER(10) CHECK(LENGTH(MNO)=10),
  8    CONSTRAINTS DID_PK_PROJECT PRIMARY KEY(DID),
  9    CONSTRAINTS DNO_FK_PROJECT FOREIGN KEY (DNO) REFERENCES DEPARTMENT(DNO)
 10  );

Table created.

SQL>
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'DOCTOR';

OWNER          CONSTRAINT_NAME      C_TABLE_NAME      SEARCH_CONDITION
SCOTT          SVS_C005633           C_DOCTOR        "DNAME" IS NOT NULL
SCOTT          SVS_C005634           C_DOCTOR        "SPEC" IS NOT NULL
SCOTT          SVS_C005635           C_DOCTOR        LENGTH(MNO)=10
SCOTT          DID_PK_PROJECT       P_DOCTOR        LENGTH(DID)=10
SCOTT          DNO_FK_PROJECT       R_DOCTOR        LENGTH(DNO)=10
```

4. Appointment Table

```
SQL> CREATE TABLE APPOINTMENT
  2  (
  3    AID NUMBER,
  4    APPOINTDATE DATE,
  5    DISCHARGEDATE DATE,
  6    STATUS VARCHAR(10),
  7    PID NUMBER,
  8    DID NUMBER,
  9    CONSTRAINTS AID_PK_APP_PROJECT PRIMARY KEY(AID),
 10   CONSTRAINTS PID_FK_APP_PROJECT FOREIGN KEY(PID) REFERENCES PATIENT(PID),
 11   CONSTRAINTS DID_FK_APP_PROJECT FOREIGN KEY(DID) REFERENCES DOCTOR(DID)
 12 );
```

Table created.

```
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'APPOINTMENT';

OWNER          CONSTRAINT_NAME          C_TABLE_NAME      SEARCH_CONDITION
SCOTT          AID_PK_APP_PROJECT      P_APPOINTMENT
SCOTT          PID_FK_APP_PROJECT      R_APPOINTMENT
SCOTT          DID_FK_APP_PROJECT      R_APPOINTMENT

SQL> |
```

5. Billing Table

```
SQL> CREATE TABLE BILLING
  2  (
  3    BID NUMBER,
  4    TOTALCOST NUMBER NULL,
  5    PAYMODE VARCHAR(15) NULL,
  6    BILLDATE DATE,
  7    PID NUMBER,
  8    AID NUMBER,
  9    CONSTRAINTS BID_PK_BILL_PROJECT PRIMARY KEY(BID),
 10   CONSTRAINTS PID_FK_BILL_PROJECT FOREIGN KEY(PID) REFERENCES PATIENT(PID),
 11   CONSTRAINTS AID_FK_BILL_PROJECT FOREIGN KEY(AID) REFERENCES APPOINTMENT(AID)
 12 );
```

Table created.

```
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'BILLING';

OWNER          CONSTRAINT_NAME          C_TABLE_NAME      SEARCH_CONDITION
SCOTT          BID_PK_BILL_PROJECT      P_BILLING
SCOTT          PID_FK_BILL_PROJECT      R_BILLING
SCOTT          AID_FK_BILL_PROJECT      R_BILLING

SQL> |
```

6. Treatment Table

```
SQL> CREATE TABLE TREATMENT
  2  (
  3    TID NUMBER,
  4    DIAGNOSIS VARCHAR(25) NULL,
  5    MEDICINE VARCHAR(40) NULL,
  6    COST NUMBER NOT NULL,
  7    AID NUMBER,
  8    CONSTRAINTS TID_PK_TREAT_PROJECT PRIMARY KEY(TID),
  9    CONSTRAINTS AID_FK_TREAT_PROJECT FOREIGN KEY(AID) REFERENCES APPOINTMENT(AID)
 10  );
```

Table created.

```
SQL>
SQL> SELECT *
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'TREATMENT';

OWNER          CONSTRAINT_NAME          C_TABLE_NAME      SEARCH_CONDITION
SCOTT          SYS_C005644              C_TREATMENT
SCOTT          TID_PK_TREAT_PROJECT    P_TREATMENT
SCOTT          AID_FK_TREAT_PROJECT    R_TREATMENT

SQL> |
```

Insertion Opretion:

```
INSERT INTO PATIENT (&PID,&PNAME,&AGE,&GENDER,&MNO,&ADDRESS);
```

```
SQL> INSERT ALL
  2  INTO DEPARTMENT (DNO, DNAME, LOC) VALUES (1, 'CARDIOLOGY', 'PUNE')
  3  INTO DEPARTMENT (DNO, DNAME, LOC) VALUES (2, 'NEUROLOGIC', 'PUNE')
  4  INTO DEPARTMENT (DNO, DNAME, LOC) VALUES (3, 'ORTHOPEDIC', 'PUNE')
  5  INTO DEPARTMENT (DNO, DNAME, LOC) VALUES (4, 'GENERAL MEDICINE', 'CHENNAI')
  6  INTO DEPARTMENT (DNO, DNAME, LOC) VALUES (5, 'DERMATOLOGY', 'PUNE')
  7  SELECT * FROM dual;

5 rows created.

SQL>
```

```
SQL> INSERT ALL
  2  INTO DOCTOR (DID,DNAME,DNO,SPEC,MNO) VALUES(1001,'RAHIL',3,'DENTIST',98765432100)
  3  INTO DOCTOR (DID,DNAME,DNO,SPEC,MNO) VALUES(1002,'DEEPA',2,'DENTIST',98765432100)
  4  INTO DOCTOR (DID,DNAME,DNO,SPEC,MNO) VALUES(1003,'SHARON',1,'HEART SPECIALIST',98765432100)
  5  INTO DOCTOR (DID,DNAME,DNO,SPEC,MNO) VALUES(1004,'SHINDE',2,'Neurologist',98765432100)
  6  INTO DOCTOR (DID,DNAME,DNO,SPEC,MNO) VALUES(1005,'THOMAS',5,'Skin Specialist',9765432100)
  7  INTO DOCTOR (DID,DNAME,DNO,SPEC,MNO) VALUES(1006,'ALLEN',3,'Ortho Surgeon',98765432100)
  8  SELECT * FROM dual;

6 rows created.

SQL>
```

```
SQL> INSERT ALL
  2  INTO APPOINTMENT VALUES (1, '01-OCT-2025', '03-OCT-2025', 'Completed', 1, 1001)
  3  INTO APPOINTMENT VALUES (2, '04-OCT-2025', '07-OCT-2025', 'Completed', 2, 1002)
  4  INTO APPOINTMENT VALUES (3, '08-OCT-2025', '11-OCT-2025', 'Completed', 3, 1003)
  5  INTO APPOINTMENT VALUES (4, '10-OCT-2025', '12-OCT-2025', 'Completed', 4, 1004)
  6  INTO APPOINTMENT VALUES (5, '13-OCT-2025', 'NULL', 'Ongoing', 4, 1004)
  7  INTO APPOINTMENT VALUES (6, '15-OCT-2025', '17-OCT-2025', 'Completed', 2, 1002)
  8  INTO APPOINTMENT VALUES (7, '18-OCT-2025', 'NULL', 'Ongoing', 5, 1005)
  9  INTO APPOINTMENT VALUES (8, '20-OCT-2025', '23-OCT-2025', 'Completed', 6, 1006)
  10  INTO APPOINTMENT VALUES (9, '25-OCT-2025', 'NULL', 'Ongoing', 1, 1004)
  11  INTO APPOINTMENT VALUES (10, '28-OCT-2025', '30-OCT-2025', 'Completed', 3, 1005)
  12  SELECT * FROM dual;

10 rows created.
```

```
SQL> INSERT ALL
  2  INTO BILLING VALUES (1, 2500, 'Cash', '03-OCT-2025', 1, 1)
  3  INTO BILLING VALUES (2, NULL, 'NULL', '07-OCT-2025', 2, 2)
  4  INTO BILLING VALUES (3, 1500, 'UPI', '12-OCT-2025', 3, 4)
  5  INTO BILLING VALUES (4, 3200, 'Online', '17-OCT-2025', 2, 6)
  6  INTO BILLING VALUES (5, 1800, 'UPI', '18-OCT-2025', 6, 8)
  7  INTO BILLING VALUES (6, 1800, 'UPI', '18-OCT-2025', 1, 10)
  8  INTO BILLING VALUES (7, 2200, 'Card', '25-OCT-2025', 1, 9)
  9  INTO BILLING VALUES (8, 5000, 'Online', '03-NOV-2025', 5, 7)
  10  INTO BILLING VALUES (9, NULL, 'NULL', '10-NOV-2025', 4, 5)
  11  INTO BILLING VALUES (10, 4000, 'Cash', '15-NOV-2025', 1, 3)
  12  SELECT * FROM dual;

10 rows created.

SQL> COMMIT;
Commit complete.
```

```
SQL> ED
Write file afiedt.buf
 1  INSERT ALL
  2  INTO TREATMENT (TID, DIAGNOSIS, MEDICINE, COST, AID) VALUES(1,'Fracture','Painkiller',2500,1)
  3  INTO TREATMENT (TID, DIAGNOSIS, MEDICINE, COST, AID) VALUES(2,'Migraine','Paracetamol',1000,2)
  4  INTO TREATMENT (TID, DIAGNOSIS, MEDICINE, COST, AID) VALUES(3,'Heart Pain','Aspirin',3000,3)
  5  INTO TREATMENT (TID, DIAGNOSIS, MEDICINE, COST, AID) VALUES(4,'Cough','Dextromethorphan',1500,4)
  6  INTO TREATMENT (TID, DIAGNOSIS, MEDICINE, COST, AID) VALUES(5,'Skin Allergy','Bintment',1500,5)
  7  INTO TREATMENT (TID, DIAGNOSIS, MEDICINE, COST, AID) VALUES(6,'Back Pain','Pain Gel',2000,6)
  8  SELECT * FROM dual;
SQL>

6 rows created.
```

```

Oracle SQL*Plus
File Edit Search Options Help
SQL>
SQL>
SQL> SELECT * FROM PATIENT;
      PID PNAME          AGE GENDER        HNO ADDRESS
-----+-----+-----+-----+-----+-----+
      1 OM BINGULE       22 MALE    8675857634 WANI,YAVATHAL
      2 FORD             34 MALE    8346734343 PANAJI,GOA
      3 PRIAY            25 FEMALE   9823456712 PUNE
      4 ARJUN            37 MALE    9000088888 PUNE
      5 SCOTT            39 MALE    8765874674 MUMBAI
      6 NEHA             42 FEMALE   8394534545
6 rows selected.

SQL> SELECT * FROM DEPARTMENT;
      DNO DNAME           LOC
-----+-----+-----+
      1 CARDIOLOGY       PUNE
      2 NEUROLOGY         MUMBAI
      3 ORTHOPEDIC        PUNE
      4 GENERAL MEDICINE CHENNAI
      5 DERMATOLOGY       PUNE
SQL> SELECT * FROM DOCTOR;
      DID DNAME           DNO SPEC          HNO
-----+-----+-----+-----+-----+
  1001 PATIL           3 BONE SPECIALIST  9765432109
  1002 DESAI           2 BRAIN SURGEON   9988766555
  1003 SHARMA          1 HEART SPECIALIST 9123456789
  1004 SHINDE          2 Neurologist    9876501234
  1005 THOMAS          5 Skin Specialist  9765432109
  1006 ALLEN           3 Ortho Surgeon   9876501234
6 rows selected.

SQL> SELECT * FROM APPOINTMENT;
      AID APPOINTM DATE DISCHARGE STATUS      PID      DID
-----+-----+-----+-----+-----+-----+-----+
      1 01-OCT-25 03-OCT-25 Completed     1 1001
      2 04-OCT-25 07-OCT-25 Completed     2 1002
      3 08-OCT-25 Pending                 1 1003
      4 10-OCT-25 12-OCT-25 Completed     3 1001
      5 13-OCT-25 Ongoing                4 1004
      6 15-OCT-25 17-OCT-25 Completed     2 1002
      7 18-OCT-25 Pending                 5 1005
      8 20-OCT-25 23-OCT-25 Completed     6 1006
      9 25-OCT-25 Ongoing                1 1004
     10 28-OCT-25 30-OCT-25 Completed     3 1005
10 rows selected.

SQL> SELECT * FROM BILLING;
      BID TOTALCOST PAYMODE      BILLDATE      PID      AID
-----+-----+-----+-----+-----+-----+-----+
      1 2500 Cash          03-OCT-25     1 1
      2 3000              07-OCT-25     2 2
      3 1500 UPI           12-OCT-25     3 4
      4 3200 Online        17-OCT-25     2 6
      5 4200 CASH          23-OCT-25     6 8
      6 1800 UPI           30-OCT-25     3 10
      7 2200 Card          25-OCT-25     1 9
      8 5000 Online        03-NOV-25     5 7
      9 2900 CASH          10-NOV-25     4 5
     10 4500 Cash          15-NOV-25     1 3
10 rows selected.

SQL> SELECT * FROM TREATMENT;
      TID DIAGNOSIS          MEDICINE          COST      AID
-----+-----+-----+-----+-----+-----+
      1 Fracture            Painkiller        2500      1
      2 Migraine            Paracetamol      1800      2
      3 Heart Pain          Aspirin          3000      3
      4 Joint Pain          Ointment         2200      4
      5 Skin Allergy         Pain Gel         1500      5
      6 Back Pain            Pain Gel         2000      6
6 rows selected.

SQL>

```