VIET NAM NATIONAL UNIVERSITY HO CHI MINH CITY

HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY

FACULTY OF COMPUTER SCIENCE AND ENGINEERING

DATABASE SYSTEM (CO2014)

Assignment report

HOSPITAL DATABASE

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Member list & Workload

No.	Full name	Student ID	Contribution
1	Vũ Nguyễn Lan Vi	2153094	42.5 %
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Contents

Chapter 1

Physical Database Design

1.1 Implement the database

1.1.1 Create table

1. **Employee (<u>UNIQUE_CODE</u>, fname, lname, gender, address, start_date, specialty_name, degree_year, DEPT_UC)**

   - **SQL Code**

   ```
   CREATE TABLE EMPLOYEE(
       UNIQUE_CODE      CHAR(9)      PRIMARY KEY,
       FNAME            VARCHAR(15)      NOT NULL,
       LNAME            VARCHAR(15)      NOT NULL,
       GENDER           CHAR,
       ADDRESS          VARCHAR(30),
       START_DATE       DATE,
       SPECIALTY_NAME   VARCHAR(20)      NOT NULL,
       DEGREE_YEAR      SMALLINT     NOT NULL,
       DEPT_UC          CHAR(3)       NOT NULL
   );

   ```

   - **Explanation:** Here we choose UNIQUE_CODE as type **CHAR(9)** to guarantee it has fixed length, and all subclassess of **Employee** must have UNIQUE_CODE of this type. We use **VARCHAR** data type for all data field that have variable length.

   - **Foreign Key:** After creating table **Department**, we set the foreign key constraint for Employee.

   ```
   ALTER TABLE EMPLOYEE
   ADD CONSTRAINT emp_dept_fk
   FOREIGN KEY(DEPT_UC) REFERENCES DEPARTMENT(UNIQUE_CODE)
   ON DELETE SET NULL;

   ```

2. **Nurse (UNIQUE_CODE)**

- **SQL Code**

```
1    CREATE TABLE NURSE(
2        UNIQUE_CODE      CHAR(9)        PRIMARY KEY,
3        CONSTRAINT nurse_emp_fk
4        FOREIGN KEY(UNIQUE_CODE) REFERENCES EMPLOYEE(UNIQUE_CODE)
5        ON DELETE CASCADE
6    );
7
```

3. **Doctor (UNIQUE_CODE)**

- **SQL Code**

```
1    CREATE TABLE DOCTOR(
2        UNIQUE_CODE      CHAR(9)      PRIMARY KEY,
3        CONSTRAINT doctor_emp_fk
4        FOREIGN KEY(UNIQUE_CODE) REFERENCES EMPLOYEE(UNIQUE_CODE)
5        ON DELETE CASCADE
6    );
7
```

4. **Dean (UNIQUE_CODE)**

- **SQL Code**

```
1    CREATE TABLE DEAN(
2        UNIQUE_CODE      CHAR(9)        PRIMARY KEY,
3        CONSTRAINT dean_doctor_fk
4        FOREIGN KEY(UNIQUE_CODE) REFERENCES  EMPLOYEE(UNIQUE_CODE)
5        ON DELETE CASCADE
6    );
7
```

5. **Department (UNIQUE_CODE, title, DEAN_UC)**

- **SQL Code**

```
1    CREATE TABLE DEPARTMENT(
2        UNIQUE_CODE          CHAR(3)      PRIMARY KEY,
3        TITLE          VARCHAR(20)     NOT NULL,
4        DEAN_UC      CHAR(9)        NOT NULL,
5        CONSTRAINT dept_dean_fk
6        FOREIGN KEY(DEAN_UC) REFERENCES DEAN(UNIQUE_CODE)
7        ON DELETE SET NULL DEFERRABLE
8    );
9
```

6. **Phone_number (PHONE_NUM, EMP_UC)**

- **SQL Code**

```
1    CREATE TABLE PHONE_NUMBER(
2        PHONE_NUM      NUMBER(10)       UNIQUE,
3        EMP_UC           CHAR(9),
4        CONSTRAINT phone_pk
5        PRIMARY KEY(PHONE_NUM, EMP_UC),
6        CONSTRAINT phone_emp_fk
7        FOREIGN KEY(EMP_UC) REFERENCES EMPLOYEE(UNIQUE_CODE)
8        ON DELETE CASCADE
9    );
10
```

- **Explanation:** Here we choose **NUMBER** data type for `Phone_number` instead **VARCHAR**.

7. **Inpatient (ID, IPCODE, fname, lname, gender, address, DOB, phone_no, NURSE_UC)**

- **SQL Code**

```
1    CREATE TABLE INPATIENT(
2        ID        CHAR(7)      PRIMARY KEY,
3        IPCODE       CHAR(9)      NOT NULL,
4        FNAME        VARCHAR(15)     NOT NULL,
5        LNAME        VARCHAR(15)     NOT NULL,
6        GENDER       CHAR,
7        ADDRESS      VARCHAR(30),
8        DOB          DATE,
9        PHONE_NO     NUMBER(10)     NOT NULL    UNIQUE,
10       NURSE_UC     CHAR(9)      NOT NULL,
11       CONSTRAINT ip_nurse_fk
12       FOREIGN KEY(NURSE_UC) REFERENCES NURSE(UNIQUE_CODE)
13       ON DELETE SET NULL
14   );
15
```

- `PHONE_NO` must be unique for each patient so setting the **UNIQUE** constaint here is essential.

8. **Outpatient (ID, OPCODE, fname, lname, gender, address, DOB, phone_no)**

- **SQL Code**

```
1    CREATE TABLE OUTPATIENT(
2        ID        CHAR(7)        PRIMARY KEY,
3        OPCODE       VARCHAR(9)     NOT NULL,
4        FNAME      VARCHAR(15)      NOT NULL,
5        LNAME      VARCHAR(15)      NOT NULL,
6        GENDER       CHAR,
7        ADDRESS       VARCHAR(30),
8        DOB          DATE,
```

```
9        PHONE_NO    NUMBER(10)      NOT NULL UNIQUE
10    );
11
```

9. **Inpatient_record (** <u>RECORD_ID</u>**, admission_date, diagnosis, discharge_date, sick_room, total_fee, IP_ID)**

   - **SQL Code**

```
1     CREATE TABLE INPATIENT_RECORD(
2         RECORD_ID      CHAR(10)    PRIMARY KEY,
3         ADMISSION_DATE      DATE,
4         DIAGNOSIS           VARCHAR(50),
5         DISCHARGE_DATE      DATE,
6         SICK_ROOM      NUMBER(3),
7         TOTAL_FEE           DECIMAL(10,2),
8         IP_ID          CHAR(7)     NOT NULL,
9         CONSTRAINT record_ip_fk
10        FOREIGN KEY(IP_ID) REFERENCES INPATIENT(ID)
11        ON DELETE SET NULL
12    );
13
```

   - **Explanation:** The **total fee** of each record must be the sum of all **treatment's fee** belong to it.

10. **Outpatient_record (** <u>RECORD_ID</u>**, total_fee, OP_ID)**

    - **SQL Code**

```
1     CREATE TABLE OUTPATIENT_RECORD(
2         RECORD_ID    CHAR(10)    PRIMARY KEY,
3         TOTAL_FEE    DECIMAL(10,2),
4         OP_ID        CHAR(7)        NOT NULL,
5         CONSTRAINT record_op_fk
6         FOREIGN KEY(OP_ID) REFERENCES OUTPATIENT(ID)
7         ON DELETE SET NULL
8     );
9
```

11. **Treatment (** <u>TREATMENT_ID</u>**, result, start_date, end_date, fee, RECORD_ID)**

    - **SQL Code**

```
1     CREATE TABLE TREATMENT(
2         TREATMENT_ID        CHAR(10)       PRIMARY KEY,
3         RESULT        VARCHAR(30)        NOT NULL,
4         START_DATE        DATE,
5         END_DATE        DATE,
6         RECORD_ID        CHAR(10)        NOT NULL,
7         FEE             DECIMAL(10,2)   NOT NULL
```

```
8          CONSTRAINT treat_rec_fk
9          FOREIGN KEY(RECORD_ID) REFERENCES INPATIENT_RECORD(RECORD_ID)
10         ON DELETE SET NULL
11      );
12
```

12. **Examination (EXAM_ID, examination_date, diagnosis, result, next_ex, fee, RECORD_ID)**

- **SQL Code**

```
1      CREATE TABLE EXAMINATION(
2          EXAM_ID        CHAR(10)     PRIMARY KEY,
3          EXAMINATE_DATE     DATE,
4          DIAGNOSIS        VARCHAR(50)     NOT NULL,
5          RESULT          VARCHAR(20)     NOT NULL,
6          NEXT_EX         DATE,
7          FEE            DECIMAL(10,2),
8          RECORD_ID     CHAR(10)     NOT NULL,
9          CONSTRAINT exam_rec_fk
10         FOREIGN KEY(RECORD_ID) REFERENCES OUTPATIENT_RECORD(RECORD_ID)
11         ON DELETE SET NULL
12      );
13
```

13. **Treat (TREATMENT_ID, DOCTOR_ID, IP_ID)**

- **SQL Code**

```
1      CREATE TABLE TREAT(
2          TREATMENT_ID       CHAR(10)       NOT NULL,
3          DOCTOR_ID        CHAR(9)         NOT NULL,
4          IP_ID       CHAR(7)     NOT NULL,
5          CONSTRAINT treat_pk
6          PRIMARY KEY(TREATMENT_ID, DOCTOR_ID),
7          CONSTRAINT treat_treatment_fk
8          FOREIGN KEY(TREATMENT_ID) REFERENCES TREATMENT(TREATMENT_ID)
9          ON DELETE CASCADE,
10         CONSTRAINT treat_doctor
11         FOREIGN KEY(DOCTOR_ID) REFERENCES DOCTOR(UNIQUE_CODE)
12         ON DELETE CASCADE,
13         CONSTRAINT treat_ip_fk
14         FOREIGN KEY(IP_ID) REFERENCES INPATIENT(ID)
15         ON DELETE CASCADE
16      );
17
```

14. **Examine (EXAM_ID, DOCTOR_ID, OP_ID)**

- **SQL Code**

```
1    CREATE TABLE EXAMINE(
2        EXAM_ID     CHAR(10)    NOT NULL,
3        DOCTOR_ID   CHAR(9)     NOT NULL,
4        OP_ID       CHAR(7)     NOT NULL,
5        CONSTRAINT examine_pk
6        PRIMARY KEY(EXAM_ID, DOCTOR_ID),
7        CONSTRAINT examine_exam_fk
8        FOREIGN KEY(EXAM_ID) REFERENCES EXAMINATION(EXAM_ID)
9        ON DELETE CASCADE,
10       CONSTRAINT examine_doctor_fk
11       FOREIGN KEY(DOCTOR_ID) REFERENCES DOCTOR(UNIQUE_CODE)
12       ON DELETE CASCADE,
13       CONSTRAINT examine_op_fk
14       FOREIGN KEY(OP_ID) REFERENCES OUTPATIENT(ID)
15       ON DELETE CASCADE
16   );
17
```

15. Medication (UNIQUE_CODE, name, current_price, total_quantity)

- **SQL Code**

```
1  CREATE TABLE MEDICATION(
2      UNIQUE_CODE     CHAR(6)     PRIMARY KEY,
3      NAME            VARCHAR(20)     NOT NULL,
4      CURRENT_PRICE       DECIMAL(10,2),
5      TOTAL_QUANTITY  INT
6  );
7
```

16. Med_effect (MED_UC, med_effect)

- **SQL Code**

```
1    CREATE TABLE MED_EFFECT(
2        MED_UC      CHAR(6),
3        MED_EFFECT      VARCHAR(30),
4        CONSTRAINT med_effect_pk
5        PRIMARY KEY(MED_UC, MED_EFFECT),
6        CONSTRAINT effect_med_fk
7        FOREIGN KEY(MED_UC) REFERENCES MEDICATION(UNIQUE_CODE)
8    );
9
```

17. Medicine (MED_ID, expiration_date, expired, box_quantity, MEDICATION_UC)

- **SQL Code**

```
1    CREATE TABLE MEDICINE(
2        MED_ID  CHAR(10)  PRIMARY KEY,
```

```
3        EXPIRATION_DATE      DATE   NOT NULL ,
4        EXPIRED      CHAR ,
5          BOX_QUANTITY   INT ,
6          MEDICATION_UC CHAR (6)    NOT NULL ,
7          CONSTRAINT medicine_med_fk
8          FOREIGN KEY (MEDICATION_UC)   REFERENCES MEDICATION (UNIQUE_CODE)
9      ) ;
10
```

18. Treat_use_med (TREATMENT_ID, MED_ID, dosage)

- **SQL Code**

```
1      CREATE TABLE TREAT_USE_MED (
2          TREATMENT_ID          CHAR (10) ,
3          MED_ID       CHAR (6) ,
4          DOSAGE       INT    NOT NULL ,
5          CONSTRAINT treat_use_med
6          PRIMARY KEY (TREATMENT_ID , MED_ID) ,
7          CONSTRAINT use_treatment_fk
8          FOREIGN KEY (TREATMENT_ID) REFERENCES TREATMENT (TREATMENT_ID)
9          ON DELETE CASCADE ,
10          CONSTRAINT use_treat_med_fk
11          FOREIGN KEY (MED_ID) REFERENCES MEDICATION (UNIQUE_CODE)
12          ON DELETE CASCADE
13      ) ;
14
```

19. Exam_use_med (EXAM_ID, MED_ID, dosage)

- **SQL Code**

```
1      CREATE TABLE EXAM_USE_MED (
2          EXAM_ID       CHAR (10) ,
3          MED_ID        CHAR (6) ,
4          DOSAGE        INT     NOT NULL ,
5          CONSTRAINT exam_use_med_pk
6          PRIMARY KEY (EXAM_ID , MED_ID) ,
7          CONSTRAINT use_exam_fk
8          FOREIGN KEY (EXAM_ID) REFERENCES EXAMINATION (EXAM_ID)
9          ON DELETE CASCADE ,
10          CONSTRAINT use_exam_med_fk
11          FOREIGN KEY (MED_ID) REFERENCES MEDICATION (UNIQUE_CODE)
12          ON DELETE CASCADE
13      ) ;
14
```

20. Provider (UNIQUE_NUMBER, name, address, phone)

- **SQL Code**

```
1    CREATE TABLE PROVIDER(
2       UNIQUE_NUMBER   NUMBER(5)   PRIMARY KEY,
3       NAME            VARCHAR(15)      NOT NULL,
4       ADDRESS         VARCHAR(30),
5       PHONE           NUMBER(10)       NOT NULL     UNIQUE
6    );
7
```

21. **Provide (MED_ID, PROV_NO, imported_price, imported_date, quantity)**

   - **SQL Code**

```
1     CREATE TABLE PROVIDE(
2        MED_ID   CHAR(10)  NOT NULL,
3      PROV_NO   NUMBER(5)      NOT NULL,
4      IMPORTED_PRICE    DECIMAL(10,2),
5      IMPORTED_DATE    DATE,
6      QUANTITY     INT,
7      CONSTRAINT provide_pk
8        PRIMARY KEY(MED_ID, PROV_NO),
9        CONSTRAINT prov_med_fk
10       FOREIGN KEY(MED_ID)   REFERENCES MEDICINE(MED_ID)
11       ON DELETE CASCADE,
12       CONSTRAINT prov_provider_fk
13       FOREIGN KEY(PROV_NO)   REFERENCES PROVIDER(UNIQUE_NUMBER)
14       ON DELETE CASCADE
15    );
16
```

1.1.2   Trigger for additional constraint

- **For Employee**

   1. **Check gender:** Gender must be either 'M' or 'F'.

```
1     CREATE OR REPLACE TRIGGER check_gender
2     BEFORE INSERT OR UPDATE ON EMPLOYEE
3     FOR EACH ROW
4     BEGIN
5        IF (:NEW.gender != 'M' AND :NEW.gender != 'F') THEN
6            RAISE_APPLICATION_ERROR(-20001, 'Gender must be either M or F');
7        END IF;
8     END;
9
```

   2. **Check dean's year of experience:** The hospital dean must have had more than 5 years of experience since the date he was awarded the specialty degree.

```
1   CREATE OR REPLACE TRIGGER dean_exp
2   BEFORE INSERT OR UPDATE ON DEAN
3   FOR EACH ROW
4   DECLARE
5       emp_start_date employee.start_date%TYPE;
6   BEGIN
7       SELECT start_date INTO emp_start_date FROM employee WHERE unique_code = :NEW.
    unique_code;
8
9       IF (EXTRACT(YEAR FROM SYSDATE) - EXTRACT(YEAR FROM emp_start_date)) <= 5 THEN
10          RAISE_APPLICATION_ERROR (-20006, 'Dean does not have enough years of
    experience');
11      END IF;
12  END;
13
```

- **For Patient**

    1. **Check IPCODE:** The IPCODE for inpatient must start with "IP".

    ```
    1   CREATE OR REPLACE TRIGGER check_ipcode
    2   BEFORE INSERT OR UPDATE ON INPATIENT
    3   FOR EACH ROW
    4   BEGIN
    5       IF (SUBSTR(:NEW.ipcode, 1, 2) != 'IP') THEN
    6           RAISE_APPLICATION_ERROR(-20004, 'IPCODE must start with IP');
    7       END IF;
    8   END;
    9
    ```

    2. **Check OPCODE:** The OPCODE for outpatient must start with "OP".

    ```
    1   CREATE OR REPLACE TRIGGER check_opcode
    2   BEFORE INSERT OR UPDATE ON OUTPATIENT
    3   FOR EACH ROW
    4   BEGIN
    5       IF (SUBSTR(:NEW.opcode, 1, 2) != 'OP') THEN
    6           RAISE_APPLICATION_ERROR(-20005, 'OPCODE must start with OP');
    7       END IF;
    8   END;
    9
    ```

    3. **Check gender:** Gender must be either 'M' or 'F'. We do the same for Inpatient and Outpatient as for Employee.

- **For Medication**

1. **Update current price for medication:** Every time a medication is imported by a provider, the current price for that medication will be automatically updated to match the newly imported price.

```
1   CREATE OR REPLACE TRIGGER update_current_price
2   AFTER INSERT OR UPDATE ON PROVIDE
3   FOR EACH ROW
4   BEGIN
5       UPDATE MEDICATION
6       SET current_price = round(:NEW.imported_price / :NEW.quantity, 2)
7       WHERE unique_code IN
8       (
9           SELECT MEDICATION_UC
10          FROM MEDICINE
11          WHERE MED_ID = :NEW.med_id
12      );
13  END;
14
```

2. **Check expired medicine:** Out of date medication shall be marked automatically on the database by the system.

```
1   CREATE OR REPLACE TRIGGER check_expired_medicine
2   BEFORE INSERT OR UPDATE ON MEDICINE
3   FOR EACH ROW
4   BEGIN
5       IF :NEW.EXPIRATION_DATE < SYSDATE THEN
6           :NEW.EXPIRED := 'T';
7       ELSE
8           :NEW.EXPIRED := 'F';
9       END IF;
10  END;
11
```

1.2 Insert data

- **Insert data into table DEPARTMENT**

```
1   --1.DEPARTMENT: 10 ROWS
2   SET CONSTRAINTS dept_dean_fk  DEFERRED;
3   INSERT INTO DEPARTMENT VALUES ('IMD', 'Internal Medicine', 'E00000011');
4   INSERT INTO DEPARTMENT VALUES ('PED', 'Pediatrics', 'E00000012');
5   INSERT INTO DEPARTMENT VALUES ('SRG', 'Surgery', 'E00000013');
6   INSERT INTO DEPARTMENT VALUES ('CRD', 'Cardiology', 'E00000014');
7   INSERT INTO DEPARTMENT VALUES ('DER', 'Dermatology', 'E00000015');
8   INSERT INTO DEPARTMENT VALUES ('OBS', 'Obstetrics', 'E00000016');
9   INSERT INTO DEPARTMENT VALUES ('NEU', 'Neurology', 'E00000017');
```

```
10    INSERT INTO DEPARTMENT VALUES ('ORT', 'Orthopedics', 'E00000018');
11    INSERT INTO DEPARTMENT VALUES ('ONC', 'Oncology', 'E00000019');
12    INSERT INTO DEPARTMENT VALUES ('ENT', 'ENT', 'E00000020');
13
```

- **Insert data into table EMPLOYEE**

```
1     --2.EMPLOYEE : 30 ROWS
2     INSERT INTO EMPLOYEE VALUES ('E00000001', 'Nguyen', 'Van A', 'M', '731 Fondren,
      Houston, TX', TO_DATE('2018-01-15', 'YYYY-MM-DD'), 'Internal Medicine', 2018, 'IMD');
3     INSERT INTO EMPLOYEE VALUES ('E00000002', 'Emily', 'Johnson', 'F', '638 Voss, Houston
      , TX', TO_DATE('2020-05-20', 'YYYY-MM-DD'), 'Pediatrics', 2020, 'PED');
4     INSERT INTO EMPLOYEE VALUES ('E00000003', 'David', 'Williams', 'M', '845 Main, Austin
      , TX', TO_DATE('2019-11-10', 'YYYY-MM-DD'), 'Surgery', 2019, 'SRG');
5     INSERT INTO EMPLOYEE VALUES ('E00000004', 'Sarah', 'Brown', 'F', '456 Allen, Dallas,
      TX', TO_DATE('2018-08-03', 'YYYY-MM-DD'), 'Cardiology', 2021, 'CRD');
6     INSERT INTO EMPLOYEE VALUES ('E00000005', 'Michael', 'Davis', 'M', '221 Oak, San
      Antonio, TX', TO_DATE('2017-03-25', 'YYYY-MM-DD'), 'Dermatology', 2017, 'DER');
7     INSERT INTO EMPLOYEE VALUES ('E00000006', 'Olivia', 'Miller', 'F', '932 Elm, Fort
      Worth, TX', TO_DATE('2020-09-14', 'YYYY-MM-DD'), 'Obstetrics', 2020, 'OBS');
8     INSERT INTO EMPLOYEE VALUES ('E00000007', 'James', 'Garcia', 'M', '567 Pine, Houston,
       TX', TO_DATE('2018-02-28', 'YYYY-MM-DD'), 'Neurology', 2018, 'NEU');
9     INSERT INTO EMPLOYEE VALUES ('E00000008', 'Sophia', 'Martinez', 'F', '763 Walnut,
      Dallas, TX', TO_DATE('2019-07-19', 'YYYY-MM-DD'), 'Orthopedics', 2019, 'ORT');
10    INSERT INTO EMPLOYEE VALUES ('E00000009', 'Daniel', 'Lopez', 'M', '321 Sycamore,
      Austin, TX', TO_DATE('2020-06-30', 'YYYY-MM-DD'), 'Oncology', 2020, 'ONC');
11    INSERT INTO EMPLOYEE VALUES ('E00000010', 'Chloe', 'Gonzalez', 'F', '127 Oakwood, San
       Antonio, TX', TO_DATE('2017-04-12', 'YYYY-MM-DD'), 'ENT', 2017, 'ENT');
12
13    INSERT INTO EMPLOYEE VALUES ('E00000011', 'William', 'Wilson', 'M', '899 Cedarwood,
      Dallas, TX', TO_DATE('2015-10-05', 'YYYY-MM-DD'), 'Internal Medicine', 2015, 'IMD');
14    INSERT INTO EMPLOYEE VALUES ('E00000012', 'Ava', 'Anderson', 'F', '543 Maplewood,
      Austin, TX', TO_DATE('2016-12-20', 'YYYY-MM-DD'), 'Pediatrics', 2016, 'PED');
15    INSERT INTO EMPLOYEE VALUES ('E00000013', 'Tran', 'Van B', 'M', '775 Birchwood,
      Houston, TX', TO_DATE('2016-09-08', 'YYYY-MM-DD'), 'Surgery', 2016, 'SRG');
16    INSERT INTO EMPLOYEE VALUES ('E00000014', 'Mia', 'Hernandez', 'F', '623 Elmwood, San
      Antonio, TX', TO_DATE('2015-04-17', 'YYYY-MM-DD'), 'Cardiology', 2015, 'CRD');
17    INSERT INTO EMPLOYEE VALUES ('E00000015', 'Noah', 'Nelson', 'M', '881 Pinewood, Fort
      Worth, TX', TO_DATE('2018-03-02', 'YYYY-MM-DD'), 'Dermatology', 2018, 'DER');
18    INSERT INTO EMPLOYEE VALUES ('E00000016', 'Emma', 'Walker', 'F', '357 Walnutwood,
      Dallas, TX', TO_DATE('2014-11-28', 'YYYY-MM-DD'), 'Obstetrics', 2014, 'OBS');
19    INSERT INTO EMPLOYEE VALUES ('E00000017', 'Liam', 'Hill', 'M', '444 Oakhill, Austin,
      TX', TO_DATE('2017-06-14', 'YYYY-MM-DD'), 'Neurology', 2017, 'NEU');
20    INSERT INTO EMPLOYEE VALUES ('E00000018', 'Isabella', 'Scott', 'F', '555 Birchhill,
      Houston, TX', TO_DATE('2016-08-07', 'YYYY-MM-DD'), 'Orthopedics', 2016, 'ORT');
21    INSERT INTO EMPLOYEE VALUES ('E00000019', 'Ella', 'Green', 'F', '223 Cedarhill, San
      Antonio, TX', TO_DATE('2017-02-19', 'YYYY-MM-DD'), 'Oncology', 2017, 'ONC');
22    INSERT INTO EMPLOYEE VALUES ('E00000020', 'Mason', 'Adams', 'M', '999 Pinewood,
      Dallas, TX', TO_DATE('2018-01-03', 'YYYY-MM-DD'), 'ENT', 2018, 'ENT');
23
```

```sql
24    INSERT INTO EMPLOYEE VALUES ('E00000021', 'Lucy', 'Baker', 'F', '123 Elm St, Houston,
      TX', TO_DATE('2019-02-28', 'YYYY-MM-DD'), 'Internal Medicine', 2019, 'IMD');
25    INSERT INTO EMPLOYEE VALUES ('E00000022', 'Jackson', 'Clark', 'M', '456 Oak St,
      Austin, TX', TO_DATE('2019-07-15', 'YYYY-MM-DD'), 'Pediatrics', 2018, 'PED');
26    INSERT INTO EMPLOYEE VALUES ('E00000023', 'Grace', 'Evans', 'F', '789 Main St, Dallas
      , TX', TO_DATE('2019-10-10', 'YYYY-MM-DD'), 'Surgery', 2018, 'SRG');
27    INSERT INTO EMPLOYEE VALUES ('E00000024', 'Henry', 'Ford', 'M', '987 Maple St, San
      Antonio, TX', TO_DATE('2019-04-20', 'YYYY-MM-DD'), 'Cardiology', 2018, 'CRD');
28    INSERT INTO EMPLOYEE VALUES ('E00000025', 'Luna', 'Gomez', 'F', '231 Oak St, Houston,
      TX', TO_DATE('2019-01-15', 'YYYY-MM-DD'), 'Dermatology', 2018, 'DER');
29    INSERT INTO EMPLOYEE VALUES ('E00000026', 'Mateo', 'Harris', 'M', '543 Cedar St,
      Austin, TX', TO_DATE('2018-12-31', 'YYYY-MM-DD'), 'Obstetrics', 2018, 'OBS');
30    INSERT INTO EMPLOYEE VALUES ('E00000027', 'Nora', 'Irwin', 'F', '777 Pine St, Dallas,
      TX', TO_DATE('2018-08-25', 'YYYY-MM-DD'), 'Neurology', 2018, 'NEU');
31    INSERT INTO EMPLOYEE VALUES ('E00000028', 'Oscar', 'Johnson', 'M', '999 Maple St, San
      Antonio, TX', TO_DATE('2017-11-11', 'YYYY-MM-DD'), 'Orthopedics', 2017, 'ORT');
32    INSERT INTO EMPLOYEE VALUES ('E00000029', 'Penelope', 'Kane', 'F', '111 Elm St,
      Houston, TX', TO_DATE('2018-03-19', 'YYYY-MM-DD'), 'Oncology', 2017, 'ONC');
33    INSERT INTO EMPLOYEE VALUES ('E00000030', 'Le', 'Van C', 'M', '456 Oak St, Austin, TX
      ', TO_DATE('2017-11-22', 'YYYY-MM-DD'), 'ENT', 2017, 'ENT');
34
```

- **Insert data into table DOCTOR**

```sql
1     --3.DOCTOR: 20 ROWS
2     INSERT INTO DOCTOR VALUES ('E00000001');
3     INSERT INTO DOCTOR VALUES ('E00000002');
4     INSERT INTO DOCTOR VALUES ('E00000003');
5     INSERT INTO DOCTOR VALUES ('E00000004');
6     INSERT INTO DOCTOR VALUES ('E00000005');
7     INSERT INTO DOCTOR VALUES ('E00000006');
8     INSERT INTO DOCTOR VALUES ('E00000007');
9     INSERT INTO DOCTOR VALUES ('E00000008');
10    INSERT INTO DOCTOR VALUES ('E00000009');
11    INSERT INTO DOCTOR VALUES ('E00000010');
12    INSERT INTO DOCTOR VALUES ('E00000011');
13    INSERT INTO DOCTOR VALUES ('E00000012');
14    INSERT INTO DOCTOR VALUES ('E00000013');
15    INSERT INTO DOCTOR VALUES ('E00000014');
16    INSERT INTO DOCTOR VALUES ('E00000015');
17    INSERT INTO DOCTOR VALUES ('E00000016');
18    INSERT INTO DOCTOR VALUES ('E00000017');
19    INSERT INTO DOCTOR VALUES ('E00000018');
20    INSERT INTO DOCTOR VALUES ('E00000019');
21    INSERT INTO DOCTOR VALUES ('E00000020');
22
```

- **Insert data into table NURSE**

```sql
1     --4.NURSE: 10 ROWS
```

```
 2    INSERT INTO NURSE VALUES ('E00000021');
 3    INSERT INTO NURSE VALUES ('E00000022');
 4    INSERT INTO NURSE VALUES ('E00000023');
 5    INSERT INTO NURSE VALUES ('E00000024');
 6    INSERT INTO NURSE VALUES ('E00000025');
 7    INSERT INTO NURSE VALUES ('E00000026');
 8    INSERT INTO NURSE VALUES ('E00000027');
 9    INSERT INTO NURSE VALUES ('E00000028');
10    INSERT INTO NURSE VALUES ('E00000029');
11    INSERT INTO NURSE VALUES ('E00000030');
12
```

- **Insert data into table DEAN**

```
 1    --5.DEAN: 10 ROWS
 2    INSERT INTO DEAN VALUES ('E00000011');
 3    INSERT INTO DEAN VALUES ('E00000012');
 4    INSERT INTO DEAN VALUES ('E00000013');
 5    INSERT INTO DEAN VALUES ('E00000014');
 6    INSERT INTO DEAN VALUES ('E00000015');
 7    INSERT INTO DEAN VALUES ('E00000016');
 8    INSERT INTO DEAN VALUES ('E00000017');
 9    INSERT INTO DEAN VALUES ('E00000018');
10    INSERT INTO DEAN VALUES ('E00000019');
11    INSERT INTO DEAN VALUES ('E00000020');
12
```

- **Insert data into table PHONE_NUMBER**

```
 1    --6.PHONE NUM: 30 ROWS
 2    INSERT INTO PHONE_NUMBER VALUES (0374182116, 'E00000001');
 3    INSERT INTO PHONE_NUMBER VALUES (0983761811, 'E00000002');
 4    INSERT INTO PHONE_NUMBER VALUES (0654781234, 'E00000003');
 5    INSERT INTO PHONE_NUMBER VALUES (0147852369, 'E00000004');
 6    INSERT INTO PHONE_NUMBER VALUES (0321569874, 'E00000005');
 7    INSERT INTO PHONE_NUMBER VALUES (0876543298, 'E00000006');
 8    INSERT INTO PHONE_NUMBER VALUES (0567123498, 'E00000007');
 9    INSERT INTO PHONE_NUMBER VALUES (0432987651, 'E00000008');
10    INSERT INTO PHONE_NUMBER VALUES (0658741236, 'E00000009');
11    INSERT INTO PHONE_NUMBER VALUES (0214365987, 'E00000010');
12    INSERT INTO PHONE_NUMBER VALUES (0765432189, 'E00000011');
13    INSERT INTO PHONE_NUMBER VALUES (0546213789, 'E00000012');
14    INSERT INTO PHONE_NUMBER VALUES (0654789231, 'E00000013');
15    INSERT INTO PHONE_NUMBER VALUES (0123456987, 'E00000014');
16    INSERT INTO PHONE_NUMBER VALUES (0458712369, 'E00000015');
17    INSERT INTO PHONE_NUMBER VALUES (0987634521, 'E00000016');
18    INSERT INTO PHONE_NUMBER VALUES (0231546879, 'E00000017');
19    INSERT INTO PHONE_NUMBER VALUES (0876123456, 'E00000018');
20    INSERT INTO PHONE_NUMBER VALUES (0567498213, 'E00000019');
21    INSERT INTO PHONE_NUMBER VALUES (0321456987, 'E00000020');
```

```sql
22   INSERT INTO PHONE_NUMBER VALUES (0765498132, 'E00000021');
23   INSERT INTO PHONE_NUMBER VALUES (0432987615, 'E00000022');
24   INSERT INTO PHONE_NUMBER VALUES (0654871329, 'E00000023');
25   INSERT INTO PHONE_NUMBER VALUES (0123456897, 'E00000024');
26   INSERT INTO PHONE_NUMBER VALUES (0654872193, 'E00000025');
27   INSERT INTO PHONE_NUMBER VALUES (0765428319, 'E00000026');
28   INSERT INTO PHONE_NUMBER VALUES (0654879231, 'E00000027');
29   INSERT INTO PHONE_NUMBER VALUES (0432198765, 'E00000028');
30   INSERT INTO PHONE_NUMBER VALUES (0765498123, 'E00000029');
31   INSERT INTO PHONE_NUMBER VALUES (0321459876, 'E00000030');
32
```

- **Insert data into table INPATIENT**

```sql
1    --7.INPATIENT: 20 ROWS
2    INSERT INTO INPATIENT VALUES ('7712443', 'IP1234567', 'John', 'Doe', 'M', '3321
     Castle, Spring, TX', TO_DATE('1990-05-15', 'YYYY-MM-DD'), 0793030117, 'E00000029');
3    INSERT INTO INPATIENT VALUES ('6421856', 'IP6421856', 'Emily', 'Smith', 'F', '450
     Stone, Houston, TX', TO_DATE('1988-09-20', 'YYYY-MM-DD'), 0808299673, 'E00000025');
4    INSERT INTO INPATIENT VALUES ('8639124', 'IP8639124', 'David', 'Johnson', 'M', '790
     Forest, Dallas, TX', TO_DATE('1995-12-10', 'YYYY-MM-DD'), 0726459038, 'E00000027');
5    INSERT INTO INPATIENT VALUES ('2597834', 'IP2597834', 'Sarah', 'Williams', 'F', '881
     Hill, Austin, TX', TO_DATE('1992-03-03', 'YYYY-MM-DD'), 0998746235, 'E00000028');
6    INSERT INTO INPATIENT VALUES ('3781647', 'IP3781647', 'Michael', 'Brown', 'M', '963
     Lake, San Antonio, TX', TO_DATE('1991-07-25', 'YYYY-MM-DD'), 0765432178, 'E00000030');
7    INSERT INTO INPATIENT VALUES ('5149210', 'IP5149210', 'Olivia', 'Davis', 'F', '753
     Valley, Fort Worth, TX', TO_DATE('1994-11-14', 'YYYY-MM-DD'), 0856789123, 'E00000024')
     ;
8    INSERT INTO INPATIENT VALUES ('9235761', 'IP9235761', 'James', 'Garcia', 'M', '111
     River, El Paso, TX', TO_DATE('1989-02-28', 'YYYY-MM-DD'), 0987654321, 'E00000021');
9    INSERT INTO INPATIENT VALUES ('3851247', 'IP3334455', 'Sophia', 'Martinez', 'F', '225
      Skyline, Corpus Chris, TX', TO_DATE('1993-06-19', 'YYYY-MM-DD'), 0843678541, '
     E00000026');
10   INSERT INTO INPATIENT VALUES ('1638942', 'IP1638942', 'Daniel', 'Lopez', 'M', '365
     Meadow, Lubbock, TX', TO_DATE('1996-08-30', 'YYYY-MM-DD'), 0912345678, 'E00000022');
11   INSERT INTO INPATIENT VALUES ('4719023', 'IP4719023', 'Chloe', 'Gonzalez', 'F', '428
     Oakwood, Amarillo, TX', TO_DATE('1997-04-12', 'YYYY-MM-DD'), 0890765432, 'E00000023');
12
13   INSERT INTO INPATIENT VALUES ('7619324', 'IP7619324', 'William', 'Wilson', 'M', '3331
      Castle, Spring, TX', TO_DATE('1990-10-05', 'YYYY-MM-DD'), 0765849312, 'E00000030');
14   INSERT INTO INPATIENT VALUES ('4621839', 'IP4621839', 'Ava', 'Anderson', 'F', '3332
     Castle, Spring, TX', TO_DATE('1991-12-20', 'YYYY-MM-DD'), 0723456789, 'E00000029');
15   INSERT INTO INPATIENT VALUES ('8956241', 'IP8956241', 'Ethan', 'Thomas', 'M', '3333
     Castle, Spring, TX', TO_DATE('1992-09-08', 'YYYY-MM-DD'), 0832451234, 'E00000028');
16   INSERT INTO INPATIENT VALUES ('2469715', 'IP2469715', 'Mia', 'Hernandez', 'F', '3334
     Castle, Spring, TX', TO_DATE('1993-04-17', 'YYYY-MM-DD'), 0793412876, 'E00000027');
17   INSERT INTO INPATIENT VALUES ('1396478', 'IP1396478', 'Noah', 'Nelson', 'M', '3335
     Castle, Spring, TX', TO_DATE('1994-03-02', 'YYYY-MM-DD'), 0801982765, 'E00000026');
18   INSERT INTO INPATIENT VALUES ('5473289', 'IP5473289', 'Emma', 'Walker', 'F', '3336
     Castle, Spring, TX', TO_DATE('1995-11-28', 'YYYY-MM-DD'), 0897865643, 'E00000025');
```

```
19    INSERT INTO INPATIENT VALUES ('9387562', 'IP9387562', 'Liam', 'Hill', 'M', '3337
      Castle, Spring, TX', TO_DATE('1996-06-14', 'YYYY-MM-DD'), 0876352918, 'E00000024');
20    INSERT INTO INPATIENT VALUES ('7283416', 'IP7283416', 'Isabella', 'Scott', 'F', '3338
       Castle, Spring, TX', TO_DATE('1997-08-07', 'YYYY-MM-DD'), 0901876523, 'E00000023');
21    INSERT INTO INPATIENT VALUES ('4817392', 'IP4817392', 'Ella', 'Green', 'F', '3339
      Castle, Spring, TX', TO_DATE('1998-02-19', 'YYYY-MM-DD'), 0776543201, 'E00000022');
22    INSERT INTO INPATIENT VALUES ('3276154', 'IP3276154', 'Mason', 'Adams', 'M', '3340
      Castle, Spring, TX', TO_DATE('1999-01-03', 'YYYY-MM-DD'), 0821369475, 'E00000021');
23
```

- **Insert data into table OUTPATIENT**

```
1     --8.OUTPATIENT: 20 ROWS
2     INSERT INTO OUTPATIENT VALUES ('7712443', 'OP7712443', 'John', 'Doe', 'M', '3321
      Castle, Spring, TX', TO_DATE('1990-05-15', 'YYYY-MM-DD'), 0793030117);
3     INSERT INTO OUTPATIENT VALUES ('8246761', 'OP8246761', 'Matthew', 'Johnson', 'M', '
      456 Elm St, Othertown, TX', TO_DATE('1989-09-20', 'YYYY-MM-DD'), 0808123456);
4     INSERT INTO OUTPATIENT VALUES ('1643985', 'OP1643985', 'Sophie', 'Garcia', 'F', '789
      Oak St, Anothertown, TX', TO_DATE('1996-12-10', 'YYYY-MM-DD'), 0726458910);
5     INSERT INTO OUTPATIENT VALUES ('7523164', 'OP7523164', 'Oliver', 'Smith', 'M', '321
      Pine St, Somewhere, TX', TO_DATE('1992-03-03', 'YYYY-MM-DD'), 0998123456);
6     INSERT INTO OUTPATIENT VALUES ('2948165', 'OP2948165', 'Abigail', 'Wilson', 'F', '555
       Cedar St, Nowhere, TX', TO_DATE('1990-07-25', 'YYYY-MM-DD'), 0765789012);
7     INSERT INTO OUTPATIENT VALUES ('9483127', 'OP9483127', 'Alexander', 'Jones', 'M', '
      777 Birch St, Elsewhere, TX', TO_DATE('1994-11-14', 'YYYY-MM-DD'), 0856789102);
8     INSERT INTO OUTPATIENT VALUES ('6314789', 'OP6314789', 'Charlotte', 'Martinez', 'F',
      '999 Elm St, Hometown, TX', TO_DATE('1987-02-28', 'YYYY-MM-DD'), 0987654322);
9     INSERT INTO OUTPATIENT VALUES ('3851247', 'OP3851247', 'Sophia', 'Martinez', 'F', '
      225 Skyline, Corpus Chris, TX', TO_DATE('1993-06-19', 'YYYY-MM-DD'), 0843678541);
10    INSERT INTO OUTPATIENT VALUES ('7491832', 'OP7491832', 'Scarlett', 'Brown', 'F', '222
       Maple St, City, TX', TO_DATE('1996-08-30', 'YYYY-MM-DD'), 0912123456);
11    INSERT INTO OUTPATIENT VALUES ('8439516', 'OP8439516', 'Henry', 'Adams', 'M', '333
      Pine St, Smalltown, TX', TO_DATE('1997-04-12', 'YYYY-MM-DD'), 0890765432);
12
13    INSERT INTO OUTPATIENT VALUES ('5183497', 'OP5183497', 'Amelia', 'Taylor', 'F', '444
      Cedar St, Anywhere, TX', TO_DATE('1990-10-05', 'YYYY-MM-DD'), 0765849312);
14    INSERT INTO OUTPATIENT VALUES ('2165483', 'OP2165483', 'Jacob', 'Lopez', 'M', '555
      Elm St, Anycity, TX', TO_DATE('1991-12-20', 'YYYY-MM-DD'), 0723123456);
15    INSERT INTO OUTPATIENT VALUES ('5134289', 'OP5134289', 'Lily', 'Hernandez', 'F', '666
       Oak St, Anyville, TX', TO_DATE('1992-09-08', 'YYYY-MM-DD'), 0832451234);
16    INSERT INTO OUTPATIENT VALUES ('8497213', 'OP8497213', 'Logan', 'Scott', 'M', '777
      Pine St, Noway, TX', TO_DATE('1993-04-17', 'YYYY-MM-DD'), 0793212876);
17    INSERT INTO OUTPATIENT VALUES ('7651234', 'OP7651234', 'Ava', 'Nelson', 'F', '888
      Cedar St, Noplace, TX', TO_DATE('1994-03-02', 'YYYY-MM-DD'), 0801982765);
18    INSERT INTO OUTPATIENT VALUES ('1937425', 'OP1937425', 'Elijah', 'Walker', 'M', '999
      Elm St, Anyplace, TX', TO_DATE('1995-11-28', 'YYYY-MM-DD'), 0897865643);
19    INSERT INTO OUTPATIENT VALUES ('7659182', 'OP7659182', 'Avery', 'Hill', 'F', '111 Oak
       St, Anycounty, TX', TO_DATE('1996-06-14', 'YYYY-MM-DD'), 0876352918);
20    INSERT INTO OUTPATIENT VALUES ('4296138', 'OP4296138', 'Madison', 'Anderson', 'F', '
      222 Elm St, Anystate, TX', TO_DATE('1997-08-07', 'YYYY-MM-DD'), 0901876523);
```

```
21    INSERT INTO OUTPATIENT VALUES ('6192358', 'OP6192358', 'Carter', 'Green', 'M', '333
      Pine St, Anynation, TX', TO_DATE('1998-02-19', 'YYYY-MM-DD'), 0776543201);
22    INSERT INTO OUTPATIENT VALUES ('3276154', 'OP1122333', 'Mason', 'Adams', 'M', '3340
      Castle, Spring, TX', TO_DATE('1999-01-03', 'YYYY-MM-DD'), 0821369475);
23
```

- **Insert data into table INPATIENT_RECORD**

```
1     --9.INPATIENT RECORDS: 25 ROWS
2     INSERT INTO INPATIENT_RECORD VALUES ('IR00000001', TO_DATE('2023-01-05', 'YYYY-MM-DD'
      ), 'Pneumonia', NULL, 101, 467.5, '1396478');
3     INSERT INTO INPATIENT_RECORD VALUES ('IR00000002', TO_DATE('2023-02-10', 'YYYY-MM-DD'
      ), 'Appendicitis', NULL, 102, 338, '1638942');
4     INSERT INTO INPATIENT_RECORD VALUES ('IR00000003', TO_DATE('2023-03-15', 'YYYY-MM-DD'
      ), 'Fractured Leg', NULL, 103, 435.25, '2469715');
5     INSERT INTO INPATIENT_RECORD VALUES ('IR00000004', TO_DATE('2023-04-20', 'YYYY-MM-DD'
      ), 'Migraine', NULL, 104, 391.5, '2597834');
6     INSERT INTO INPATIENT_RECORD VALUES ('IR00000005', TO_DATE('2023-05-25', 'YYYY-MM-DD'
      ), 'Bronchitis', NULL, 105, 417.25, '3276154');
7     INSERT INTO INPATIENT_RECORD VALUES ('IR00000006', TO_DATE('2023-06-30', 'YYYY-MM-DD'
      ), 'Gastritis', NULL, 106, 325.5, '3781647');
8     INSERT INTO INPATIENT_RECORD VALUES ('IR00000007', TO_DATE('2023-07-05', 'YYYY-MM-DD'
      ), 'Kidney Stones', NULL, 107, 238.5, '6421856');
9     INSERT INTO INPATIENT_RECORD VALUES ('IR00000008', TO_DATE('2023-08-10', 'YYYY-MM-DD'
      ), 'Concussion', NULL, 108, 256.5, '4621839');
10    INSERT INTO INPATIENT_RECORD VALUES ('IR00000009', TO_DATE('2023-09-15', 'YYYY-MM-DD'
      ), 'Anemia', NULL, 109, 277, '4719023');
11    INSERT INTO INPATIENT_RECORD VALUES ('IR00000010', TO_DATE('2023-10-20', 'YYYY-MM-DD'
      ), 'Food Poisoning', NULL, 110, 235, '4817392');
12    INSERT INTO INPATIENT_RECORD VALUES ('IR00000011', TO_DATE('2023-11-25', 'YYYY-MM-DD'
      ), 'Broken Arm', NULL, 111, 147.5, '5149210');
13    INSERT INTO INPATIENT_RECORD VALUES ('IR00000012', TO_DATE('2023-12-31', 'YYYY-MM-DD'
      ), 'Asthma', NULL, 112, 244, '5473289');
14    INSERT INTO INPATIENT_RECORD VALUES ('IR00000018', TO_DATE('2023-07-05', 'YYYY-MM-DD'
      ), 'Bronchitis', NULL, 118, 289.5, '8956241');
15    INSERT INTO INPATIENT_RECORD VALUES ('IR00000019', TO_DATE('2023-08-10', 'YYYY-MM-DD'
      ), 'Gastritis', NULL, 119, 233.5, '9235761');
16    INSERT INTO INPATIENT_RECORD VALUES ('IR00000020', TO_DATE('2023-09-15', 'YYYY-MM-DD'
      ), 'Kidney Stones', NULL, 120, 273, '9387562');
17    INSERT INTO INPATIENT_RECORD VALUES ('IR00000021', TO_DATE('2023-10-20', 'YYYY-MM-DD'
      ), 'Concussion', NULL, 121, 120, '1396478');
18    INSERT INTO INPATIENT_RECORD VALUES ('IR00000022', TO_DATE('2023-11-25', 'YYYY-MM-DD'
      ), 'Anemia', NULL, 122, 168.75, '1638942');
19    INSERT INTO INPATIENT_RECORD VALUES ('IR00000023', TO_DATE('2023-12-31', 'YYYY-MM-DD'
      ), 'Food Poisoning', NULL, 123, 201.5, '2469715');
20    INSERT INTO INPATIENT_RECORD VALUES ('IR00000024', TO_DATE('2023-01-05', 'YYYY-MM-DD'
      ), 'Broken Arm', NULL, 124, 248.5, '2597834');
21    INSERT INTO INPATIENT_RECORD VALUES ('IR00000025', TO_DATE('2023-02-10', 'YYYY-MM-DD'
      ), 'Diabetes', NULL, 125, 312, '3276154');
22
```

```
23   INSERT INTO INPATIENT_RECORD VALUES ('IR00000013', TO_DATE('2023-02-10', 'YYYY-MM-DD'
     ), 'Heart Attack', TO_DATE('2023-02-15', 'YYYY-MM-DD'), 113, 298, '3851247');
24   INSERT INTO INPATIENT_RECORD VALUES ('IR00000014', TO_DATE('2023-03-15', 'YYYY-MM-DD'
     ), 'Pneumonia', TO_DATE('2023-03-20', 'YYYY-MM-DD'), 114, 281.5, '7283416');
25   INSERT INTO INPATIENT_RECORD VALUES ('IR00000015', TO_DATE('2023-04-20', 'YYYY-MM-DD'
     ), 'Appendicitis', TO_DATE('2023-04-25', 'YYYY-MM-DD'), 115, 312.25, '7619324');
26   INSERT INTO INPATIENT_RECORD VALUES ('IR00000016', TO_DATE('2023-05-25', 'YYYY-MM-DD'
     ), 'Fractured Leg', TO_DATE('2023-05-30', 'YYYY-MM-DD'), 116, 131.75, '7712443');
27   INSERT INTO INPATIENT_RECORD VALUES ('IR00000017', TO_DATE('2023-06-30', 'YYYY-MM-DD'
     ), 'Migraine', TO_DATE('2023-07-05', 'YYYY-MM-DD'), 117, 158.75, '8639124');
28
```

- Insert data into table **OUTPATIENT_RECORD**

```
1    --21. OUTPATIENT_RECORD: 25 ROWS
2    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000001', 281, '1643985');
3    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000002', 600, '1937425');
4    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000003', 492, '2165483');
5    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000004', 443.75, '2948165');
6    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000005', 436.25, '3276154');
7    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000006', 374, '3851247');
8    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000007', 88.5, '4296138');
9    INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000008', 397.25, '5134289');
10   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000009', 332, '5183497');
11   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000010', 298, '6192358');
12   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000011', 168.75, '6314789');
13   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000012', 205, '7491832');
14   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000013', 270, '7523164');
15   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000014', 242.75, '7651234');
16   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000015', 145.5, '7659182');
17   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000016', 321.75, '7712443');
18   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000017', 135.5, '8246761');
19   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000018', 258.5, '8439516');
20   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000019', 351.5, '8497213');
21   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000020', 292, '9483127');
22   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000021', 180, '1643985');
23   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000022', 184.75, '1937425');
24   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000023', 320, '2165483');
25   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000024', 205.5, '2948165');
26   INSERT INTO OUTPATIENT_RECORD VALUES ('OR00000025', 138, '3276154');
27
```

- Insert data into table **MEDICATION**

```
1    --10.MEDICATION: 15 ROWS
2    INSERT INTO MEDICATION VALUES ('PAR001', 'Paracetamol', 5.50, 250);
3    INSERT INTO MEDICATION VALUES ('IBU002', 'Ibuprofen', 7.25, 180);
4    INSERT INTO MEDICATION VALUES ('ASP003', 'Aspirin', 4.75, 300);
5    INSERT INTO MEDICATION VALUES ('AMX004', 'Amoxicillin', 10.00, 200);
6    INSERT INTO MEDICATION VALUES ('OMP005', 'Omeprazole', 15.75, 150);
```

```
7    INSERT INTO MEDICATION VALUES ('ATV006', 'Atorvastatin', 20.00, 120);
8    INSERT INTO MEDICATION VALUES ('MET007', 'Metformin', 8.50, 220);
9    INSERT INTO MEDICATION VALUES ('LIS008', 'Lisinopril', 9.25, 270);
10   INSERT INTO MEDICATION VALUES ('SIM009', 'Simvastatin', 18.75, 100);
11   INSERT INTO MEDICATION VALUES ('AML010', 'Amlodipine', 11.50, 280);
12   INSERT INTO MEDICATION VALUES ('AZI011', 'Azithromycin', 14.25, 160);
13   INSERT INTO MEDICATION VALUES ('CIP012', 'Ciprofloxacin', 12.75, 240);
14   INSERT INTO MEDICATION VALUES ('PRD013', 'Prednisone', 6.00, 330);
15   INSERT INTO MEDICATION VALUES ('RNT014', 'Ranitidine', 9.00, 190);
16   INSERT INTO MEDICATION VALUES ('MET015', 'Metronidazole', 17.50, 180);
17
```

- **Insert data into table MEDICINE**

```
1    --11.MEDICINE: 30 ROWS
2    INSERT INTO MEDICINE VALUES ('AML0100001', TO_DATE('2024-05-15', 'YYYY-MM-DD'), 'F',
     100, 'AML010');
3    INSERT INTO MEDICINE VALUES ('AML0100002', TO_DATE('2025-01-20', 'YYYY-MM-DD'), 'F',
     80, 'AML010');
4    INSERT INTO MEDICINE VALUES ('AMX0040001', TO_DATE('2025-06-18', 'YYYY-MM-DD'), 'F',
     90, 'AMX004');
5    INSERT INTO MEDICINE VALUES ('AMX0040002', TO_DATE('2024-10-30', 'YYYY-MM-DD'), 'F',
     100, 'AMX004');
6    INSERT INTO MEDICINE VALUES ('ASP0030001', TO_DATE('2024-09-12', 'YYYY-MM-DD'), 'F',
     90, 'ASP003');
7    INSERT INTO MEDICINE VALUES ('ASP0030002', TO_DATE('2023-10-25', 'YYYY-MM-DD'), 'T',
     60, 'ASP003');
8    INSERT INTO MEDICINE VALUES ('ATV0060001', TO_DATE('2024-12-25', 'YYYY-MM-DD'), 'F',
     75, 'ATV006');
9    INSERT INTO MEDICINE VALUES ('ATV0060002', TO_DATE('2025-03-30', 'YYYY-MM-DD'), 'F',
     85, 'ATV006');
10   INSERT INTO MEDICINE VALUES ('AZI0110001', TO_DATE('2025-07-10', 'YYYY-MM-DD'), 'F',
     95, 'AZI011');
11   INSERT INTO MEDICINE VALUES ('AZI0110002', TO_DATE('2024-08-15', 'YYYY-MM-DD'), 'F',
     70, 'AZI011');
12   INSERT INTO MEDICINE VALUES ('CIP0120001', TO_DATE('2024-11-20', 'YYYY-MM-DD'), 'F',
     80, 'CIP012');
13   INSERT INTO MEDICINE VALUES ('CIP0120002', TO_DATE('2025-02-05', 'YYYY-MM-DD'), 'F',
     85, 'CIP012');
14   INSERT INTO MEDICINE VALUES ('IBU0020001', TO_DATE('2024-06-30', 'YYYY-MM-DD'), 'F',
     100, 'IBU002');
15   INSERT INTO MEDICINE VALUES ('IBU0020002', TO_DATE('2025-04-22', 'YYYY-MM-DD'), 'F',
     90, 'IBU002');
16   INSERT INTO MEDICINE VALUES ('LIS0080001', TO_DATE('2024-03-12', 'YYYY-MM-DD'), 'F',
     85, 'LIS008');
17   INSERT INTO MEDICINE VALUES ('LIS0080002', TO_DATE('2025-09-05', 'YYYY-MM-DD'), 'F',
     95, 'LIS008');
18   INSERT INTO MEDICINE VALUES ('MET0070001', TO_DATE('2025-11-20', 'YYYY-MM-DD'), 'F',
     75, 'MET007');
```

```
19    INSERT INTO MEDICINE VALUES ('MET0070002', TO_DATE('2024-08-25', 'YYYY-MM-DD'), 'F',
      80, 'MET007');
20    INSERT INTO MEDICINE VALUES ('MET0150001', TO_DATE('2026-12-10', 'YYYY-MM-DD'), 'F',
      65, 'MET015');
21    INSERT INTO MEDICINE VALUES ('MET0150002', TO_DATE('2024-07-15', 'YYYY-MM-DD'), 'F',
      70, 'MET015');
22    INSERT INTO MEDICINE VALUES ('OMP0050001', TO_DATE('2024-02-28', 'YYYY-MM-DD'), 'F',
      90, 'OMP005');
23    INSERT INTO MEDICINE VALUES ('OMP0050002', TO_DATE('2025-05-10', 'YYYY-MM-DD'), 'F',
      85, 'OMP005');
24    INSERT INTO MEDICINE VALUES ('PAR0010001', TO_DATE('2024-10-02', 'YYYY-MM-DD'), 'F',
      100, 'PAR001');
25    INSERT INTO MEDICINE VALUES ('PAR0010002', TO_DATE('2025-08-20', 'YYYY-MM-DD'), 'F',
      95, 'PAR001');
26    INSERT INTO MEDICINE VALUES ('PRD0130001', TO_DATE('2024-04-15', 'YYYY-MM-DD'), 'F',
      75, 'PRD013');
27    INSERT INTO MEDICINE VALUES ('PRD0130002', TO_DATE('2025-06-05', 'YYYY-MM-DD'), 'F',
      80, 'PRD013');
28    INSERT INTO MEDICINE VALUES ('RNT0140001', TO_DATE('2023-09-20', 'YYYY-MM-DD'), 'T',
      60, 'RNT014');
29    INSERT INTO MEDICINE VALUES ('RNT0140002', TO_DATE('2023-11-05', 'YYYY-MM-DD'), 'T',
      65, 'RNT014');
30    INSERT INTO MEDICINE VALUES ('SIM0090001', TO_DATE('2025-07-01', 'YYYY-MM-DD'), 'F',
      85, 'SIM009');
31    INSERT INTO MEDICINE VALUES ('SIM0090002', TO_DATE('2024-11-30', 'YYYY-MM-DD'), 'F',
      90, 'SIM009');
32
```

- **Insert data into table PROVIDER**

```
1     --12.PROVIDER: 8 ROWS
2     INSERT INTO PROVIDER VALUES (10001, 'ABC Hospital', '1234 Elm Street, Houston, TX',
      0124567890);
3     INSERT INTO PROVIDER VALUES (10002, 'XYZ Clinic', '5678 Oak Avenue, Houston, TX',
      0981234567);
4     INSERT INTO PROVIDER VALUES (10003, 'EFG Medical Ct', '9101 Maple Drive, Houston, TX'
      , 0129876543);
5     INSERT INTO PROVIDER VALUES (10004, 'PQR Health Ct', '2345 Birch Lane, Houston, TX',
      0248097531);
6     INSERT INTO PROVIDER VALUES (10005, 'LMN Healthcare', '6789 Pine Road, Houston, TX',
      0369518274);
7     INSERT INTO PROVIDER VALUES (10006, 'QRS Clinic', '3456 Cedar Street, Houston, TX',
      0958632741);
8     INSERT INTO PROVIDER VALUES (10007, 'IJK Hospital', '7890 Elm Avenue, Houston, TX',
      0157236849);
9     INSERT INTO PROVIDER VALUES (10008, 'STU Medical Ct', '1234 Oak Lane, Houston, TX',
      0754362189);
10
```

- **Insert data into table MED_EFFECT**

```
1   --13.MED-EFFECT: 15 ROWS
2   INSERT INTO MED_EFFECT VALUES ('AML010', 'AML Treatment');
3   INSERT INTO MED_EFFECT VALUES ('AMX004', 'Bacterial Infection Treatment');
4   INSERT INTO MED_EFFECT VALUES ('ASP003', 'Blood Thinning');
5   INSERT INTO MED_EFFECT VALUES ('ATV006', 'Cholesterol Regulation');
6   INSERT INTO MED_EFFECT VALUES ('AZI011', 'Antibiotic Treatment');
7   INSERT INTO MED_EFFECT VALUES ('CIP012', 'Infection Control');
8   INSERT INTO MED_EFFECT VALUES ('IBU002', 'Pain Management');
9   INSERT INTO MED_EFFECT VALUES ('LIS008', 'Blood Pressure Regulation');
10  INSERT INTO MED_EFFECT VALUES ('MET007', 'Diabetes Control');
11  INSERT INTO MED_EFFECT VALUES ('MET015', 'Metabolic Disorder Therapy');
12  INSERT INTO MED_EFFECT VALUES ('OMP005', 'Acid Reflux Control');
13  INSERT INTO MED_EFFECT VALUES ('PAR001', 'Headache Relief');
14  INSERT INTO MED_EFFECT VALUES ('PRD013', 'Pain Control');
15  INSERT INTO MED_EFFECT VALUES ('RNT014', 'Respiratory Therapy');
16  INSERT INTO MED_EFFECT VALUES ('SIM009', 'Sinus Infection Treatment');
17
```

- **Insert data into table TREATMENT**

```
1   --14.TREATMENT: 30 ROWS
2   INSERT INTO TREATMENT VALUES ('T000000001', 'Fever Reduced', TO_DATE('2023-02-01', 'YYYY-MM-DD'), TO_DATE('2023-02-05', 'YYYY-MM-DD'), 'IR00000001');
3   INSERT INTO TREATMENT VALUES ('T000000002', 'Pain Alleviated', TO_DATE('2023-03-03', 'YYYY-MM-DD'), TO_DATE('2023-03-08', 'YYYY-MM-DD'), 'IR00000002');
4   INSERT INTO TREATMENT VALUES ('T000000003', 'Infection Controlled', TO_DATE('2023-04-05', 'YYYY-MM-DD'), TO_DATE('2023-04-10', 'YYYY-MM-DD'), 'IR00000003');
5   INSERT INTO TREATMENT VALUES ('T000000004', 'Recovery in Progress', TO_DATE('2023-05-12', 'YYYY-MM-DD'), TO_DATE('2023-05-17', 'YYYY-MM-DD'), 'IR00000004');
6   INSERT INTO TREATMENT VALUES ('T000000005', 'Wound Healing', TO_DATE('2023-06-15', 'YYYY-MM-DD'), TO_DATE('2023-06-20', 'YYYY-MM-DD'), 'IR00000005');
7   INSERT INTO TREATMENT VALUES ('T000000006', 'Post-Op Checkup', TO_DATE('2023-07-18', 'YYYY-MM-DD'), TO_DATE('2023-07-23', 'YYYY-MM-DD'), 'IR00000006');
8   INSERT INTO TREATMENT VALUES ('T000000007', 'Medication Adjustment', TO_DATE('2023-08-21', 'YYYY-MM-DD'), TO_DATE('2023-08-26', 'YYYY-MM-DD'), 'IR00000007');
9   INSERT INTO TREATMENT VALUES ('T000000008', 'Physical Therapy', TO_DATE('2023-09-24', 'YYYY-MM-DD'), TO_DATE('2023-09-29', 'YYYY-MM-DD'), 'IR00000008');
10  INSERT INTO TREATMENT VALUES ('T000000009', 'Blood Tests', TO_DATE('2023-10-27', 'YYYY-MM-DD'), TO_DATE('2023-11-01', 'YYYY-MM-DD'), 'IR00000009');
11  INSERT INTO TREATMENT VALUES ('T000000010', 'Diagnostic Imaging', TO_DATE('2023-11-29', 'YYYY-MM-DD'), TO_DATE('2023-12-03', 'YYYY-MM-DD'), 'IR00000010');
12  INSERT INTO TREATMENT VALUES ('T000000011', 'Pain Management', TO_DATE('2023-02-03', 'YYYY-MM-DD'), TO_DATE('2023-02-07', 'YYYY-MM-DD'), 'IR00000011');
13  INSERT INTO TREATMENT VALUES ('T000000012', 'Physiotherapy', TO_DATE('2023-03-06', 'YYYY-MM-DD'), TO_DATE('2023-03-11', 'YYYY-MM-DD'), 'IR00000012');
14  INSERT INTO TREATMENT VALUES ('T000000013', 'Routine Check-up', TO_DATE('2023-04-09', 'YYYY-MM-DD'), TO_DATE('2023-04-14', 'YYYY-MM-DD'), 'IR00000013');
15  INSERT INTO TREATMENT VALUES ('T000000014', 'Post-Surgery Consultation', TO_DATE('2023-05-14', 'YYYY-MM-DD'), TO_DATE('2023-05-19', 'YYYY-MM-DD'), 'IR00000014');
```

```
16   INSERT INTO TREATMENT VALUES ('T000000015', 'Follow-up Examination', TO_DATE('
     2023-06-17', 'YYYY-MM-DD'), TO_DATE('2023-06-22', 'YYYY-MM-DD'), 'IR00000015');
17   INSERT INTO TREATMENT VALUES ('T000000016', 'Rehabilitation Session', TO_DATE('
     2023-07-20', 'YYYY-MM-DD'), TO_DATE('2023-07-25', 'YYYY-MM-DD'), 'IR00000016');
18   INSERT INTO TREATMENT VALUES ('T000000017', 'Treatment Review', TO_DATE('2023-08-23',
      'YYYY-MM-DD'), TO_DATE('2023-08-28', 'YYYY-MM-DD'), 'IR00000017');
19   INSERT INTO TREATMENT VALUES ('T000000018', 'Medication Assessment', TO_DATE('
     2023-09-26', 'YYYY-MM-DD'), TO_DATE('2023-10-01', 'YYYY-MM-DD'), 'IR00000018');
20   INSERT INTO TREATMENT VALUES ('T000000019', 'Physical Exam', TO_DATE('2023-10-29', '
     YYYY-MM-DD'), TO_DATE('2023-11-03', 'YYYY-MM-DD'), 'IR00000019');
21   INSERT INTO TREATMENT VALUES ('T000000020', 'Check-up Appointment', TO_DATE('
     2023-11-30', 'YYYY-MM-DD'), TO_DATE('2023-12-05', 'YYYY-MM-DD'), 'IR00000020');
22   INSERT INTO TREATMENT VALUES ('T000000021', 'Fever Monitoring', TO_DATE('2023-02-05',
      'YYYY-MM-DD'), TO_DATE('2023-02-10', 'YYYY-MM-DD'), 'IR00000021');
23   INSERT INTO TREATMENT VALUES ('T000000022', 'Pain Management Session', TO_DATE('
     2023-03-08', 'YYYY-MM-DD'), TO_DATE('2023-03-13', 'YYYY-MM-DD'), 'IR00000022');
24   INSERT INTO TREATMENT VALUES ('T000000023', 'Recovery Assessment', TO_DATE('
     2023-04-11', 'YYYY-MM-DD'), TO_DATE('2023-04-16', 'YYYY-MM-DD'), 'IR00000023');
25   INSERT INTO TREATMENT VALUES ('T000000024', 'Wound Dressing', TO_DATE('2023-05-16', '
     YYYY-MM-DD'), TO_DATE('2023-05-21', 'YYYY-MM-DD'), 'IR00000024');
26   INSERT INTO TREATMENT VALUES ('T000000025', 'Post-Op Consultation', TO_DATE('
     2023-06-19', 'YYYY-MM-DD'), TO_DATE('2023-06-24', 'YYYY-MM-DD'), 'IR00000025');
27   INSERT INTO TREATMENT VALUES ('T000000026', 'Diagnostic Tests', TO_DATE('2023-07-22',
      'YYYY-MM-DD'), TO_DATE('2023-07-27', 'YYYY-MM-DD'), 'IR00000001');
28   INSERT INTO TREATMENT VALUES ('T000000027', 'Physical Rehabilitation', TO_DATE('
     2023-08-25', 'YYYY-MM-DD'), TO_DATE('2023-08-30', 'YYYY-MM-DD'), 'IR00000002');
29   INSERT INTO TREATMENT VALUES ('T000000028', 'Treatment Follow-up', TO_DATE('
     2023-09-28', 'YYYY-MM-DD'), TO_DATE('2023-10-03', 'YYYY-MM-DD'), 'IR00000003');
30   INSERT INTO TREATMENT VALUES ('T000000029', 'Medication Review', TO_DATE('2023-10-31'
     , 'YYYY-MM-DD'), TO_DATE('2023-11-05', 'YYYY-MM-DD'), 'IR00000004');
31   INSERT INTO TREATMENT VALUES ('T000000030', 'Check-up Evaluation', TO_DATE('
     2023-04-30', 'YYYY-MM-DD'), TO_DATE('2023-07-05', 'YYYY-MM-DD'), 'IR00000005');
32
```

- Insert data into table EXAMINATION

```
1    --15.EXAMINATION: 25 ROWS
2    INSERT INTO EXAMINATION VALUES ('E000000001', TO_DATE('2023-01-15', 'YYYY-MM-DD'), '
     Blood Test', 'Normal', TO_DATE('2023-01-25', 'YYYY-MM-DD'), 150.00, 'OR00000001');
3    INSERT INTO EXAMINATION VALUES ('E000000002', TO_DATE('2023-02-20', 'YYYY-MM-DD'), 'X
     -Ray', 'Abnormal Findings', TO_DATE('2023-02-28', 'YYYY-MM-DD'), 180.00, 'OR00000002')
     ;
4    INSERT INTO EXAMINATION VALUES ('E000000003', TO_DATE('2023-03-10', 'YYYY-MM-DD'), '
     MRI Scan', 'Positive', TO_DATE('2023-03-15', 'YYYY-MM-DD'), 250.00, 'OR00000003');
5    INSERT INTO EXAMINATION VALUES ('E000000004', TO_DATE('2023-04-05', 'YYYY-MM-DD'), '
     Ultrasound', 'Normal', TO_DATE('2023-04-15', 'YYYY-MM-DD'), 200.00, 'OR00000004');
6    INSERT INTO EXAMINATION VALUES ('E000000005', TO_DATE('2023-05-18', 'YYYY-MM-DD'), '
     EKG', 'Inconclusive', TO_DATE('2023-05-25', 'YYYY-MM-DD'), 120.00, 'OR00000005');
7    INSERT INTO EXAMINATION VALUES ('E000000006', TO_DATE('2023-06-22', 'YYYY-MM-DD'), '
     CT Scan', 'Positive', TO_DATE('2023-06-30', 'YYYY-MM-DD'), 300.00, 'OR00000006');
```

```
8    INSERT INTO EXAMINATION VALUES ('E000000007', TO_DATE('2023-07-12', 'YYYY-MM-DD'), '
     Physical Exam', 'Normal', TO_DATE('2023-07-20', 'YYYY-MM-DD'), 80.00, 'OR00000007');
9    INSERT INTO EXAMINATION VALUES ('E000000008', TO_DATE('2023-08-30', 'YYYY-MM-DD'), '
     Colonoscopy', 'Negative', TO_DATE('2023-09-10', 'YYYY-MM-DD'), 350.00, 'OR00000008');
10   INSERT INTO EXAMINATION VALUES ('E000000009', TO_DATE('2023-09-25', 'YYYY-MM-DD'), '
     Endoscopy', 'Positive', TO_DATE('2023-10-05', 'YYYY-MM-DD'), 320.00, 'OR00000009');
11   INSERT INTO EXAMINATION VALUES ('E000000010', TO_DATE('2023-10-08', 'YYYY-MM-DD'), '
     Biopsy', 'Negative', TO_DATE('2023-10-15', 'YYYY-MM-DD'), 280.00, 'OR00000010');
12   INSERT INTO EXAMINATION VALUES ('E000000011', TO_DATE('2023-01-15', 'YYYY-MM-DD'), '
     Blood Test', 'Normal', NULL, 150.00, 'OR00000011');
13   INSERT INTO EXAMINATION VALUES ('E000000012', TO_DATE('2023-02-20', 'YYYY-MM-DD'), 'X
     -Ray', 'Negative', NULL, 180.00, 'OR00000012');
14   INSERT INTO EXAMINATION VALUES ('E000000013', TO_DATE('2023-03-10', 'YYYY-MM-DD'), '
     MRI Scan', 'Positive', NULL, 250.00, 'OR00000013');
15   INSERT INTO EXAMINATION VALUES ('E000000014', TO_DATE('2023-04-05', 'YYYY-MM-DD'), '
     Ultrasound', 'Normal', NULL, 200.00, 'OR00000014');
16   INSERT INTO EXAMINATION VALUES ('E000000015', TO_DATE('2023-05-18', 'YYYY-MM-DD'), '
     EKG', 'Negative', NULL, 120.00, 'OR00000015');
17   INSERT INTO EXAMINATION VALUES ('E000000016', TO_DATE('2023-06-22', 'YYYY-MM-DD'), '
     CT Scan', 'Positive', NULL, 300.00, 'OR00000016');
18   INSERT INTO EXAMINATION VALUES ('E000000017', TO_DATE('2023-07-12', 'YYYY-MM-DD'), '
     Physical Exam', 'Normal', NULL, 80.00, 'OR00000017');
19   INSERT INTO EXAMINATION VALUES ('E000000018', TO_DATE('2023-08-30', 'YYYY-MM-DD'), '
     Colonoscopy', 'Negative', NULL, 350.00, 'OR00000018');
20   INSERT INTO EXAMINATION VALUES ('E000000019', TO_DATE('2023-09-25', 'YYYY-MM-DD'), '
     Endoscopy', 'Positive', NULL, 320.00, 'OR00000019');
21   INSERT INTO EXAMINATION VALUES ('E000000020', TO_DATE('2023-10-08', 'YYYY-MM-DD'), '
     Biopsy', 'Negative', NULL, 280.00, 'OR00000020');
22   INSERT INTO EXAMINATION VALUES ('E000000021', TO_DATE('2023-01-05', 'YYYY-MM-DD'), '
     Blood Test', 'Normal', TO_DATE('2023-01-10', 'YYYY-MM-DD'), 150.00, 'OR00000021');
23   INSERT INTO EXAMINATION VALUES ('E000000022', TO_DATE('2023-02-12', 'YYYY-MM-DD'), 'X
     -Ray', 'Negative', TO_DATE('2023-02-20', 'YYYY-MM-DD'), 180.00, 'OR00000022');
24   INSERT INTO EXAMINATION VALUES ('E000000023', TO_DATE('2023-03-20', 'YYYY-MM-DD'), '
     MRI Scan', 'Positive', TO_DATE('2023-03-25', 'YYYY-MM-DD'), 250.00, 'OR00000023');
25   INSERT INTO EXAMINATION VALUES ('E000000024', TO_DATE('2023-04-15', 'YYYY-MM-DD'), '
     Ultrasound', 'Normal', TO_DATE('2023-04-25', 'YYYY-MM-DD'), 200.00, 'OR00000024');
26   INSERT INTO EXAMINATION VALUES ('E000000025', TO_DATE('2023-05-28', 'YYYY-MM-DD'), '
     EKG', 'Abnormal Findings', TO_DATE('2023-06-05', 'YYYY-MM-DD'), 120.00, 'OR00000025');
27   INSERT INTO EXAMINATION VALUES ('E000000026', TO_DATE('2023-06-15', 'YYYY-MM-DD'), '
     Blood Pressure Check', 'Normal', TO_DATE('2023-06-20', 'YYYY-MM-DD'), 90.00, '
     OR00000001');
28   INSERT INTO EXAMINATION VALUES ('E000000027', TO_DATE('2023-07-10', 'YYYY-MM-DD'), '
     Colonoscopy', 'Abnormal Findings', TO_DATE('2023-07-18', 'YYYY-MM-DD'), 320.00, '
     OR00000002');
29   INSERT INTO EXAMINATION VALUES ('E000000028', TO_DATE('2023-08-22', 'YYYY-MM-DD'), '
     Stress Test', 'Negative', TO_DATE('2023-08-30', 'YYYY-MM-DD'), 200.00, 'OR00000003');
30   INSERT INTO EXAMINATION VALUES ('E000000029', TO_DATE('2023-09-05', 'YYYY-MM-DD'), '
     Allergy Test', 'Positive', TO_DATE('2023-09-12', 'YYYY-MM-DD'), 180.00, 'OR00000004');
31   INSERT INTO EXAMINATION VALUES ('E000000030', TO_DATE('2023-10-18', 'YYYY-MM-DD'), '
```

```
            CT Scan', 'Normal', TO_DATE('2023-10-25', 'YYYY-MM-DD'), 280.00, 'OR00000005');
32
```

- Insert data into table **TREAT_USE_MED**

```
1    --16. TREAT_USE_MED:
2    INSERT INTO TREAT_USE_MED VALUES ('T000000001', 'AML010', 3);
3    INSERT INTO TREAT_USE_MED VALUES ('T000000002', 'ATV006', 2);
4    INSERT INTO TREAT_USE_MED VALUES ('T000000003', 'AZI011', 1);
5    INSERT INTO TREAT_USE_MED VALUES ('T000000004', 'CIP012', 2);
6    INSERT INTO TREAT_USE_MED VALUES ('T000000005', 'IBU002', 1);
7    INSERT INTO TREAT_USE_MED VALUES ('T000000006', 'LIS008', 6);
8    INSERT INTO TREAT_USE_MED VALUES ('T000000007', 'MET007', 5);
9    INSERT INTO TREAT_USE_MED VALUES ('T000000008', 'OMP005', 2);
10   INSERT INTO TREAT_USE_MED VALUES ('T000000009', 'PRD013', 2);
11   INSERT INTO TREAT_USE_MED VALUES ('T000000010', 'RNT014', 3);
12   INSERT INTO TREAT_USE_MED VALUES ('T000000011', 'SIM009', 2);
13   INSERT INTO TREAT_USE_MED VALUES ('T000000012', 'AML010', 4);
14   INSERT INTO TREAT_USE_MED VALUES ('T000000013', 'ATV006', 1);
15   INSERT INTO TREAT_USE_MED VALUES ('T000000014', 'AZI011', 2);
16   INSERT INTO TREAT_USE_MED VALUES ('T000000015', 'CIP012', 7);
17   INSERT INTO TREAT_USE_MED VALUES ('T000000016', 'IBU002', 3);
18   INSERT INTO TREAT_USE_MED VALUES ('T000000017', 'LIS008', 3);
19   INSERT INTO TREAT_USE_MED VALUES ('T000000018', 'MET007', 1);
20   INSERT INTO TREAT_USE_MED VALUES ('T000000019', 'OMP005', 2);
21   INSERT INTO TREAT_USE_MED VALUES ('T000000020', 'PRD013', 4);
22   INSERT INTO TREAT_USE_MED VALUES ('T000000021', 'AMX004', 2);
23   INSERT INTO TREAT_USE_MED VALUES ('T000000022', 'ASP003', 1);
24   INSERT INTO TREAT_USE_MED VALUES ('T000000023', 'MET015', 3);
25   INSERT INTO TREAT_USE_MED VALUES ('T000000024', 'PAR001', 1);
26   INSERT INTO TREAT_USE_MED VALUES ('T000000025', 'RNT014', 7);
27   INSERT INTO TREAT_USE_MED VALUES ('T000000026', 'SIM009', 2);
28   INSERT INTO TREAT_USE_MED VALUES ('T000000027', 'ATV006', 2);
29   INSERT INTO TREAT_USE_MED VALUES ('T000000028', 'IBU002', 4);
30   INSERT INTO TREAT_USE_MED VALUES ('T000000029', 'PRD013', 3);
31   INSERT INTO TREAT_USE_MED VALUES ('T000000030', 'AML010', 5);
32
```

- Insert data into table **EXAM_USE_MED**

```
1    --17. EXAM_USE_MED: 30 rows:
2    INSERT INTO EXAM_USE_MED VALUES ('E000000001', 'AML010', 1);
3    INSERT INTO EXAM_USE_MED VALUES ('E000000002', 'ATV006', 2);
4    INSERT INTO EXAM_USE_MED VALUES ('E000000003', 'AZI011', 1);
5    INSERT INTO EXAM_USE_MED VALUES ('E000000004', 'CIP012', 4);
6    INSERT INTO EXAM_USE_MED VALUES ('E000000005', 'IBU002', 3);
7    INSERT INTO EXAM_USE_MED VALUES ('E000000006', 'LIS008', 8);
8    INSERT INTO EXAM_USE_MED VALUES ('E000000007', 'MET007', 1);
9    INSERT INTO EXAM_USE_MED VALUES ('E000000008', 'OMP005', 3);
10   INSERT INTO EXAM_USE_MED VALUES ('E000000009', 'PRD013', 2);
```

```
11    INSERT INTO EXAM_USE_MED VALUES ('E000000010', 'RNT014', 2);
12    INSERT INTO EXAM_USE_MED VALUES ('E000000011', 'SIM009', 1);
13    INSERT INTO EXAM_USE_MED VALUES ('E000000012', 'AML010', 5);
14    INSERT INTO EXAM_USE_MED VALUES ('E000000013', 'ATV006', 1);
15    INSERT INTO EXAM_USE_MED VALUES ('E000000014', 'AZI011', 3);
16    INSERT INTO EXAM_USE_MED VALUES ('E000000015', 'CIP012', 2);
17    INSERT INTO EXAM_USE_MED VALUES ('E000000016', 'IBU002', 3);
18    INSERT INTO EXAM_USE_MED VALUES ('E000000017', 'LIS008', 6);
19    INSERT INTO EXAM_USE_MED VALUES ('E000000018', 'MET007', 1);
20    INSERT INTO EXAM_USE_MED VALUES ('E000000019', 'OMP005', 2);
21    INSERT INTO EXAM_USE_MED VALUES ('E000000020', 'PRD013', 2);
22    INSERT INTO EXAM_USE_MED VALUES ('E000000021', 'AMX004', 3);
23    INSERT INTO EXAM_USE_MED VALUES ('E000000022', 'ASP003', 1);
24    INSERT INTO EXAM_USE_MED VALUES ('E000000023', 'MET015', 4);
25    INSERT INTO EXAM_USE_MED VALUES ('E000000024', 'PAR001', 1);
26    INSERT INTO EXAM_USE_MED VALUES ('E000000025', 'RNT014', 2);
27    INSERT INTO EXAM_USE_MED VALUES ('E000000026', 'RNT014', 4);
28    INSERT INTO EXAM_USE_MED VALUES ('E000000027', 'ATV006', 3);
29    INSERT INTO EXAM_USE_MED VALUES ('E000000028', 'LIS008', 3);
30    INSERT INTO EXAM_USE_MED VALUES ('E000000029', 'CIP012', 1);
31    INSERT INTO EXAM_USE_MED VALUES ('E000000030', 'IBU002', 2);
32
```

- Insert data into table TREAT

```
1     --18.TREAT: 30 ROWS
2     INSERT INTO TREAT VALUES ('T000000001', 'E00000001', '1396478');
3     INSERT INTO TREAT VALUES ('T000000002', 'E00000002', '1638942');
4     INSERT INTO TREAT VALUES ('T000000003', 'E00000003', '2469715');
5     INSERT INTO TREAT VALUES ('T000000004', 'E00000004', '2597834');
6     INSERT INTO TREAT VALUES ('T000000005', 'E00000005', '3276154');
7     INSERT INTO TREAT VALUES ('T000000006', 'E00000006', '3781647');
8     INSERT INTO TREAT VALUES ('T000000007', 'E00000007', '3851247');
9     INSERT INTO TREAT VALUES ('T000000008', 'E00000008', '4621839');
10    INSERT INTO TREAT VALUES ('T000000009', 'E00000009', '4719023');
11    INSERT INTO TREAT VALUES ('T000000010', 'E00000010', '4817392');
12    INSERT INTO TREAT VALUES ('T000000011', 'E00000011', '5149210');
13    INSERT INTO TREAT VALUES ('T000000012', 'E00000012', '5473289');
14    INSERT INTO TREAT VALUES ('T000000013', 'E00000013', '6421856');
15    INSERT INTO TREAT VALUES ('T000000014', 'E00000014', '7283416');
16    INSERT INTO TREAT VALUES ('T000000015', 'E00000015', '7619324');
17    INSERT INTO TREAT VALUES ('T000000016', 'E00000016', '7712443');
18    INSERT INTO TREAT VALUES ('T000000017', 'E00000017', '8639124');
19    INSERT INTO TREAT VALUES ('T000000018', 'E00000018', '8956241');
20    INSERT INTO TREAT VALUES ('T000000019', 'E00000019', '9235761');
21    INSERT INTO TREAT VALUES ('T000000020', 'E00000020', '9387562');
22
23    INSERT INTO TREAT VALUES ('T000000021', 'E00000001', '1396478');
24    INSERT INTO TREAT VALUES ('T000000022', 'E00000002', '1638942');
25    INSERT INTO TREAT VALUES ('T000000023', 'E00000003', '2469715');
```

```
26   INSERT INTO TREAT VALUES ('T000000024', 'E00000004', '2597834');
27   INSERT INTO TREAT VALUES ('T000000025', 'E00000005', '3276154');
28   INSERT INTO TREAT VALUES ('T000000026', 'E00000006', '1396478');
29   INSERT INTO TREAT VALUES ('T000000027', 'E00000007', '1638942');
30   INSERT INTO TREAT VALUES ('T000000028', 'E00000008', '2469715');
31   INSERT INTO TREAT VALUES ('T000000029', 'E00000009', '2597834');
32   INSERT INTO TREAT VALUES ('T000000030', 'E00000010', '3276154');
33
```

- **Insert data into table EXAMINE**

```
1    --19.EXAMINE: 30 ROWS
2    INSERT INTO EXAMINE VALUES ('E000000001', 'E00000001', '1643985');
3    INSERT INTO EXAMINE VALUES ('E000000002', 'E00000002', '1937425');
4    INSERT INTO EXAMINE VALUES ('E000000003', 'E00000003', '2165483');
5    INSERT INTO EXAMINE VALUES ('E000000004', 'E00000004', '2948165');
6    INSERT INTO EXAMINE VALUES ('E000000005', 'E00000005', '3276154');
7    INSERT INTO EXAMINE VALUES ('E000000006', 'E00000006', '3851247');
8    INSERT INTO EXAMINE VALUES ('E000000007', 'E00000007', '4296138');
9    INSERT INTO EXAMINE VALUES ('E000000008', 'E00000008', '5134289');
10   INSERT INTO EXAMINE VALUES ('E000000009', 'E00000009', '5183497');
11   INSERT INTO EXAMINE VALUES ('E000000010', 'E00000010', '6192358');
12   INSERT INTO EXAMINE VALUES ('E000000011', 'E00000011', '6314789');
13   INSERT INTO EXAMINE VALUES ('E000000012', 'E00000012', '7491832');
14   INSERT INTO EXAMINE VALUES ('E000000013', 'E00000013', '7523164');
15   INSERT INTO EXAMINE VALUES ('E000000014', 'E00000014', '7651234');
16   INSERT INTO EXAMINE VALUES ('E000000015', 'E00000015', '1643985');
17   INSERT INTO EXAMINE VALUES ('E000000016', 'E00000016', '7712443');
18   INSERT INTO EXAMINE VALUES ('E000000017', 'E00000017', '8246761');
19   INSERT INTO EXAMINE VALUES ('E000000018', 'E00000018', '8439516');
20   INSERT INTO EXAMINE VALUES ('E000000019', 'E00000019', '8497213');
21   INSERT INTO EXAMINE VALUES ('E000000020', 'E00000020', '9483127');
22
23   INSERT INTO EXAMINE VALUES ('E000000021', 'E00000001', '1643985');
24   INSERT INTO EXAMINE VALUES ('E000000022', 'E00000002', '1937425');
25   INSERT INTO EXAMINE VALUES ('E000000023', 'E00000003', '2165483');
26   INSERT INTO EXAMINE VALUES ('E000000024', 'E00000004', '2948165');
27   INSERT INTO EXAMINE VALUES ('E000000025', 'E00000005', '3276154');
28   INSERT INTO EXAMINE VALUES ('E000000026', 'E00000006', '1643985');
29   INSERT INTO EXAMINE VALUES ('E000000027', 'E00000007', '1937425');
30   INSERT INTO EXAMINE VALUES ('E000000028', 'E00000008', '2165483');
31   INSERT INTO EXAMINE VALUES ('E000000029', 'E00000009', '2948165');
32   INSERT INTO EXAMINE VALUES ('E000000030', 'E00000010', '3276154');
33
```

- **Insert data into table Provide**

```
1    --20.PROVIDE:
2    INSERT INTO PROVIDE VALUES ('AML0100001', 10001, 225.50, TO_DATE('2023-05-15', 'YYYY-
     MM-DD'), 50);
```

```
3    INSERT INTO PROVIDE VALUES ('AML0100002', 10002, 230.00, TO_DATE('2023-06-20', 'YYYY-
     MM-DD'), 60);
4    INSERT INTO PROVIDE VALUES ('AMX0040001', 10003, 227.00, TO_DATE('2023-07-18', 'YYYY-
     MM-DD'), 45);
5    INSERT INTO PROVIDE VALUES ('AMX0040002', 10004, 235.25, TO_DATE('2023-08-30', 'YYYY-
     MM-DD'), 70);
6    INSERT INTO PROVIDE VALUES ('ASP0030001', 10005, 232.75, TO_DATE('2023-09-12', 'YYYY-
     MM-DD'), 65);
7    INSERT INTO PROVIDE VALUES ('ASP0030002', 10006, 333.50, TO_DATE('2023-10-20', 'YYYY-
     MM-DD'), 80);
8    INSERT INTO PROVIDE VALUES ('ATV0060001', 10007, 220.75, TO_DATE('2023-11-05', 'YYYY-
     MM-DD'), 40);
9    INSERT INTO PROVIDE VALUES ('ATV0060002', 10008, 222.00, TO_DATE('2023-12-10', 'YYYY-
     MM-DD'), 55);
10   INSERT INTO PROVIDE VALUES ('AZI0110001', 10001, 221.25, TO_DATE('2023-01-15', 'YYYY-
     MM-DD'), 30);
11   INSERT INTO PROVIDE VALUES ('AZI0110002', 10002, 445.00, TO_DATE('2023-02-28', 'YYYY-
     MM-DD'), 90);
12   INSERT INTO PROVIDE VALUES ('CIP0120001', 10003, 442.50, TO_DATE('2023-03-20', 'YYYY-
     MM-DD'), 85);
13   INSERT INTO PROVIDE VALUES ('CIP0120002', 10004, 444.25, TO_DATE('2023-04-25', 'YYYY-
     MM-DD'), 95);
14   INSERT INTO PROVIDE VALUES ('IBU0020001', 10005, 328.75, TO_DATE('2023-05-30', 'YYYY-
     MM-DD'), 75);
15   INSERT INTO PROVIDE VALUES ('IBU0020002', 10006, 330.00, TO_DATE('2023-06-15', 'YYYY-
     MM-DD'), 80);
16   INSERT INTO PROVIDE VALUES ('LIS0080001', 10007, 329.25, TO_DATE('2023-07-20', 'YYYY-
     MM-DD'), 85);
17   INSERT INTO PROVIDE VALUES ('LIS0080002', 10008, 333.50, TO_DATE('2023-08-10', 'YYYY-
     MM-DD'), 70);
18   INSERT INTO PROVIDE VALUES ('MET0070001', 10001, 335.00, TO_DATE('2023-09-18', 'YYYY-
     MM-DD'), 75);
19   INSERT INTO PROVIDE VALUES ('MET0070002', 10002, 334.25, TO_DATE('2023-10-22', 'YYYY-
     MM-DD'), 80);
20   INSERT INTO PROVIDE VALUES ('MET0150001', 10003, 215.50, TO_DATE('2023-11-08', 'YYYY-
     MM-DD'), 55);
21   INSERT INTO PROVIDE VALUES ('MET0150002', 10004, 217.00, TO_DATE('2023-12-12', 'YYYY-
     MM-DD'), 60);
22   INSERT INTO PROVIDE VALUES ('OMP0050001', 10005, 16.25, TO_DATE('2023-01-18', 'YYYY-
     MM-DD'), 65);
23   INSERT INTO PROVIDE VALUES ('OMP0050002', 10006, 440.25, TO_DATE('2023-02-25', 'YYYY-
     MM-DD'), 85);
24   INSERT INTO PROVIDE VALUES ('PAR0010001', 10007, 438.75, TO_DATE('2023-03-10', 'YYYY-
     MM-DD'), 80);
25   INSERT INTO PROVIDE VALUES ('PAR0010002', 10008, 339.50, TO_DATE('2023-04-15', 'YYYY-
     MM-DD'), 75);
26   INSERT INTO PROVIDE VALUES ('PRD0130001', 10001, 222.00, TO_DATE('2023-05-28', 'YYYY-
     MM-DD'), 65);
27   INSERT INTO PROVIDE VALUES ('PRD0130002', 10002, 223.50, TO_DATE('2023-06-20', 'YYYY-
```

```
      MM-DD'), 70);
28    INSERT INTO PROVIDE VALUES ('RNT0140001', 10003, 422.75, TO_DATE('2023-07-25', 'YYYY-
      MM-DD'), 75);
29    INSERT INTO PROVIDE VALUES ('RNT0140002', 10004, 130.00, TO_DATE('2023-08-05', 'YYYY-
      MM-DD'), 25);
30    INSERT INTO PROVIDE VALUES ('SIM0090001', 10005, 231.50, TO_DATE('2023-09-15', 'YYYY-
      MM-DD'), 50);
31    INSERT INTO PROVIDE VALUES ('SIM0090002', 10006, 230.75, TO_DATE('2023-10-18', 'YYYY-
      MM-DD'), 55);
32
```

Chapter 2

Store Procedure, Function, SQL

2.1 SQL

<div style="border:1px solid green">

Question 1

Increase Inpatient Fee to **10%** for all the current inpatients who are admitted to hospital from **01/09/2020**.

</div>

Answer

- **SQL code**

```
1    UPDATE INPATIENT_RECORD
2    SET TOTAL_FEE = 1.1*TOTAL_FEE
3    WHERE ADMISSION_DATE >= TO_DATE(TO_DATE('2020-09-01', 'YYYY-MM-DD'))
4    AND DISCHARGE_DATE IS NULL;
5
```

Listing 2.1: Increase Inpatient Fee

- **Check result**

```
1  SELECT record_id, admission_date, discharge_date, total_fee FROM INPATIENT_RECORD;
2
```

- **Result**

	RECORD_ID	ADMISSION_DATE	DISCHARGE_DATE	TOTAL_FEE
6	IR00000006	30-JUN-23	(null)	325.5
7	IR00000007	05-JUL-23	(null)	238.5
8	IR00000008	10-AUG-23	(null)	256.5
9	IR00000009	15-SEP-23	(null)	277
10	IR00000010	20-OCT-23	(null)	235
11	IR00000011	25-NOV-23	(null)	147.5
12	IR00000012	31-DEC-23	(null)	244
13	IR00000018	05-JUL-23	(null)	289.5
14	IR00000019	10-AUG-23	(null)	233.5
15	IR00000020	15-SEP-23	(null)	273
16	IR00000021	20-OCT-23	(null)	120
17	IR00000022	25-NOV-23	(null)	168.76
18	IR00000023	31-DEC-23	(null)	201.5
19	IR00000024	05-JAN-23	(null)	248.5
20	IR00000025	10-FEB-23	(null)	312
21	IR00000013	10-FEB-23	15-FEB-23	298
22	IR00000014	15-MAR-23	20-MAR-23	281.5
23	IR00000015	20-APR-23	25-APR-23	312.25
24	IR00000016	25-MAY-23	30-MAY-23	131.75
25	IR00000017	30-JUN-23	05-JUL-23	158.75

(a) Before Updating

	RECORD_ID	ADMISSION_DATE	DISCHARGE_DATE	TOTAL_FEE
6	IR00000006	30-JUN-23	(null)	358.05
7	IR00000007	05-JUL-23	(null)	262.35
8	IR00000008	10-AUG-23	(null)	282.15
9	IR00000009	15-SEP-23	(null)	304.7
10	IR00000010	20-OCT-23	(null)	258.5
11	IR00000011	25-NOV-23	(null)	162.25
12	IR00000012	31-DEC-23	(null)	268.4
13	IR00000018	05-JUL-23	(null)	318.45
14	IR00000019	10-AUG-23	(null)	256.85
15	IR00000020	15-SEP-23	(null)	300.3
16	IR00000021	20-OCT-23	(null)	132
17	IR00000022	25-NOV-23	(null)	185.64
18	IR00000023	31-DEC-23	(null)	221.65
19	IR00000024	05-JAN-23	(null)	273.35
20	IR00000025	10-FEB-23	(null)	343.2
21	IR00000013	10-FEB-23	15-FEB-23	298
22	IR00000014	15-MAR-23	20-MAR-23	281.5
23	IR00000015	20-APR-23	25-APR-23	312.25
24	IR00000016	25-MAY-23	30-MAY-23	131.75
25	IR00000017	30-JUN-23	05-JUL-23	158.75

(b) After Updating

Figure 2.1: Increase Inpatient Fee to 10%

Question 2

Select all the patients (outpatient & inpatient) of the doctor named **'Nguyen Van A'**.

Answer

- **SQL code**

```
SELECT DISTINCT id, ip, op, fname, lname, phone_no, address, doctor_name FROM
(SELECT i.id, i.ipcode AS ip,
CASE WHEN id IN (SELECT id FROM outpatient) THEN (SELECT opcode FROM outpatient o
WHERE o.id = i.id) ELSE NULL END AS op,
i.fname, i.lname, i.phone_no, i.address, d.fname || ' ' || d.lname AS doctor_name
FROM inpatient i, employee d, treat t
WHERE t.doctor_id = d.unique_code AND t.ip_id = i.id AND d.fname || ' ' || d.lname
LIKE '%Nguyen Van A%'
UNION ALL
SELECT o.id,
CASE WHEN id IN (SELECT id FROM inpatient) THEN (SELECT ipcode FROM inpatient i WHERE
 i.id = o.id) ELSE NULL END AS ip,
o.opcode AS op, o.fname, o.lname, o.phone_no, o.address, d.fname || ' ' || d.lname as
 doctor_name
FROM outpatient o , employee d, examine e
WHERE e.doctor_id = d.unique_code AND e.op_id = o.id AND d.fname || ' ' || d.lname
LIKE '%Nguyen Van A%')
```

Listing 2.2: Select All Patients

- **Result**

	ID	IP	OP	FNAME	LNAME	PHONE_NO	ADDRESS	DOCTOR_NAME
1	1396478	IP1396478	(null)	Noah	Nelson	801982765	3335 Castle, Spring, TX	Nguyen Van A
2	8956241	IP8956241	(null)	Ethan	Thomas	832451234	3333 Castle, Spring, TX	Nguyen Van A
3	1643985	(null)	OP1643985	Sophie	Garcia	726458910	789 Oak St, Anothertown, TX	Nguyen Van A
4	4296138	(null)	OP4296138	Madison	Anderson	901876523	222 Elm St, Anystate, TX	Nguyen Van A

Figure 2.2: *Query result*

2.2 Function

> **Question 3**
>
> Write a function to calculate the total medication price a patient has to pay for each treatment or examination
>
> - **Input:** Patient ID
>
> - **Output:** A list of payment of each treatment or examination

Answer

- **SQL code**

```sql
CREATE OR REPLACE TYPE T_RECORD AS OBJECT (
  DOCTOR_NAME    VARCHAR(30),
  NO_PATIENT     INT
);

CREATE OR REPLACE TYPE T_TABLE AS TABLE OF T_RECORD;

CREATE OR REPLACE FUNCTION CAL_TOTAL_MEDICATION_PRICE
(PATIENTID IN INPATIENT.ID%TYPE)
RETURN T_TABLE PIPELINED IS
BEGIN
    FOR REC IN (
    SELECT T.TREATMENT_ID AS ID, U.DOSAGE*M.CURRENT_PRICE AS PRICE
    FROM TREATMENT T, TREAT_USE_MED U, MEDICATION M, INPATIENT_RECORD R
    WHERE R.IP_ID = PATIENTID AND R.RECORD_ID = T.RECORD_ID
    AND T.TREATMENT_ID = U.TREATMENT_ID AND U.MED_ID = M.UNIQUE_CODE
    UNION
    SELECT E.EXAM_ID AS ID, U.DOSAGE*M.CURRENT_PRICE AS PRICE
    FROM EXAMINATION E, EXAM_USE_MED U, MEDICATION M, OUTPATIENT_RECORD R
    WHERE R.OP_ID = PATIENTID AND R.RECORD_ID = E.RECORD_ID
    AND E.EXAM_ID = U.EXAM_ID AND U.MED_ID = M.UNIQUE_CODE)
    LOOP
    PIPE ROW(T_RECORD(REC.ID, REC.PRICE));
```

```
24          END LOOP;
25          RETURN;
26      END;
27
```

<div align="center">Listing 2.3: Increase Inpatient Fee</div>

- **Call Function**

```
1   SELECT * FROM TABLE(CAL_TOTAL_MEDICATION_PRICE('3851247'));
2
```

- **Result**

	TREAT_EXAM_ID	TOTAL_PAYMENT
1	T000000013	20
2	E000000006	74

<div align="center">Figure 2.3: Query result</div>

2.3   Store Procedure

> **Question 4**
>
> Write a procedure to sort the doctor in increasing number of patients he/she takes care in a period of time
>
> - **Input:** Start date, End date
>
> - **Output:** A list of sorting doctors

Answer

- **SQL code**

```
1    create or replace procedure sort_doctor
2    (startdate in varchar2,
3    enddate in varchar2
4    )
5    as
6        cursor c1 is
7            SELECT distinct d.fname || ' ' || d.lname as doctor_name, count(*) as
     no_patient
8            FROM treat t, employee d, treatment m, inpatient_record i
9            WHERE i.admission_date >= TO_DATE(TO_DATE(startdate, 'YYYY-MM-DD'))
10           AND i.admission_date <= TO_DATE(TO_DATE(enddate, 'YYYY-MM-DD'))
```
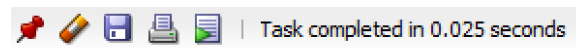
```
11              and d.unique_code = t.doctor_id and i.record_id = m.record_id
12              and m.treatment_id = t.treatment_id
13            GROUP BY t.ip_id, d.lname, d.fname
14            ORDER BY COUNT(*);
15      begin
16          DBMS_OUTPUT.PUT_LINE(RPAD('DOCTOR_NAME', 20) || 'NO_PATIENT');
17          for rec in c1 loop
18              DBMS_OUTPUT.PUT_LINE(RPAD(rec.doctor_name, 20) || rec.no_patient);
19          end loop;
20      end;
21
```

Listing 2.4: Increase Inpatient Fee

- **Call Procedure**

```
1      set serveroutput on;
2      exec sort_doctor('2023-01-01', '2023-11-01');
3
```

- **Result**

Figure 2.4: *Query result*

Chapter 3

Building Applications

The application was created using React for frontend and Express js for the backend.

> **Question 5**
>
> Log in, log out (enter the user name/password for Manager account to log in/out).

3.1 Log in, log out (enter the user name/password for Manager account to log in/out).

We have implemented a simple login and log-out system for entering the username and password. User can enter either account, (username: Le Viet Tung password: 2153083 or username: Vu Nguyen Lan Vi password: 2153094)

(a) Login Page

(b) Account Database

Figure 3.1: Login system
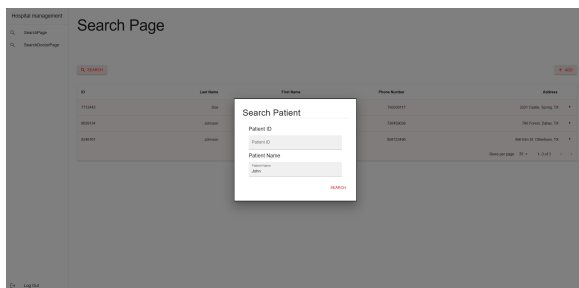
3.2 Search patient information: Search results include the name, phone number and information about the treatment and visit of the patient.
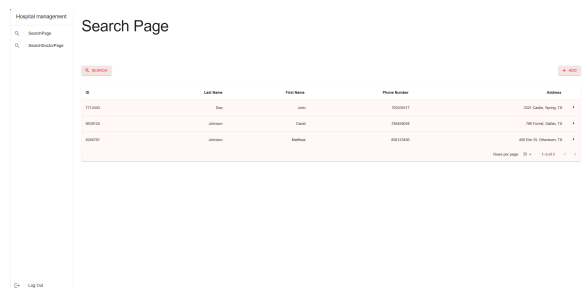
> **Question 6**
>
> Search patient information: Search results include the name, phone number and information about the treatment and visit of the patient.

Answer

We have decided that the manager may search for the patient details via patient ID or patient name. The result of The search will be displayed in a table format. The information which can be seen at the table are patient ID, first name, phone number and address. The manager will also have an option to see the the patient info in more detail by click on the arrow button.

(a) Search form

(b) Result

(c) Detail patient info

Figure 3.2: Search Patient

3.3   Add information for a new patient.

> **Question 7**
>
> Add information for a new patient.

Answer

To add information for a new patient we are required to enter in an input form which then will submit the data to the server and the server will add the patient info into the database.
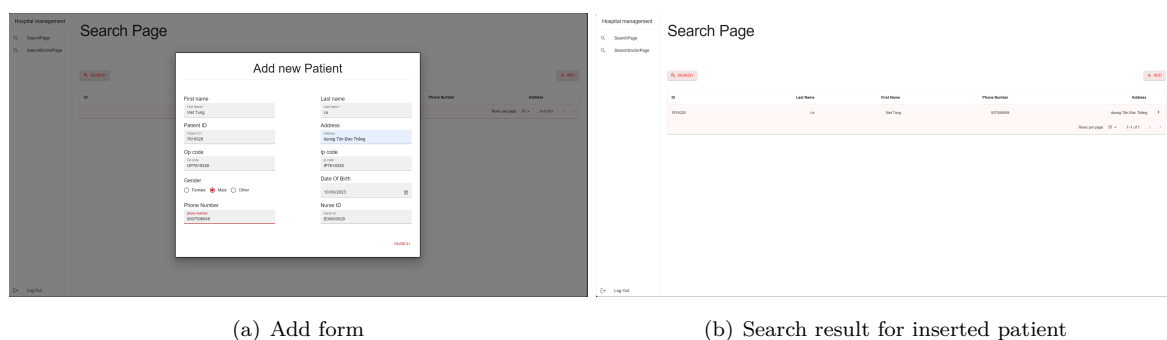
| (a) Add form | (b) Search result for inserted patient |

Figure 3.3: Login system

The system also have some simple form validation which will prevent the user from entering some invalid input.
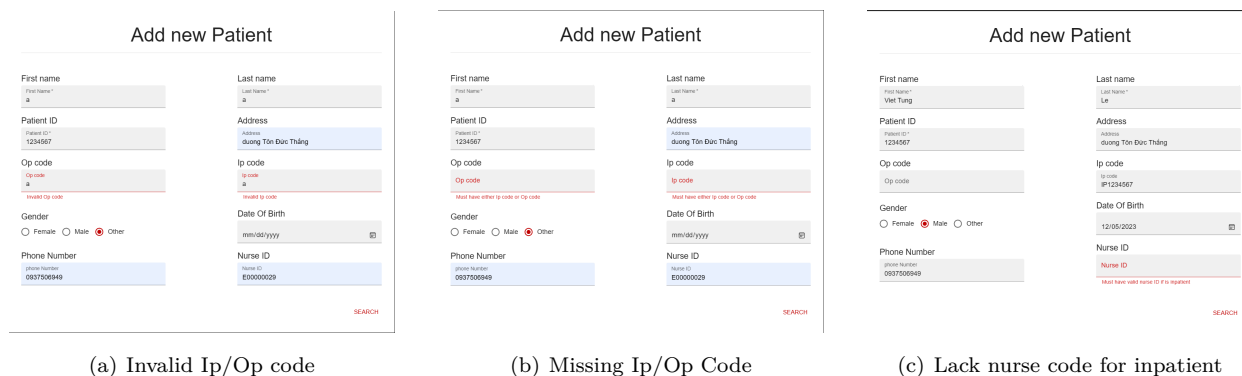
| (a) Invalid Ip/Op code | (b) Missing Ip/Op Code | (c) Lack nurse code for inpatient |

Figure 3.4: Login system
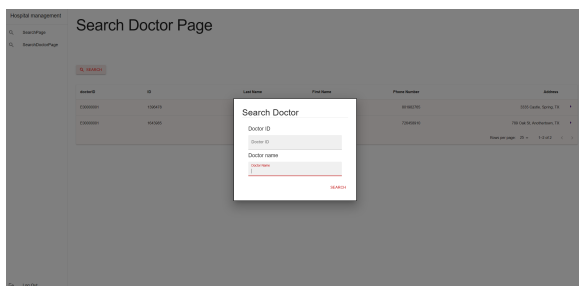
3.4 List details of all patients who are treated by a doctor.
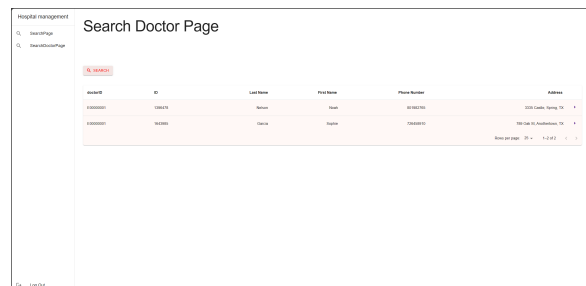
> **Question 8**
>
> List details of all patients which are treated by a doctor.

Answer

Similarly to search for patients we also have an input form however this will receive, **Doctor Name, Doctor ID**. And the result will be the info of all the patients that this doctor has treated. Similarly, we could also see the patient info in more detail however, the data will only include Record, Treatment, Examine **which the doctor has treated or examined**.

(a) Search form Doctor

(b) Result Doctor

(c) Detail patient info with specific doctor

Figure 3.5: Search Doctor

In Figure 3.5, the third subfigure shown that there are only one treatment although the total record price > the single treatment record price.

(a) Select Treatment

(b) Created pdf file

Figure 3.6: Export treatment

3.5 Make a report that provides full information about the payment for each treatment or examination of a patient.

> **Question 9**
>
> Make a report that provides full information about the payment for each treatment or examination of a patient

Answer

In other to complete this task we require are require to export a file with the detail of the treatment of each patient. We will use jsPDF and jspdf-invoice-template for this. In The patient report after clicking the show detail for each record. We will have the option to tick on each row. After that we can click on export pdf which will export the detail of every treatment/examine selected into the pdf file.

Chapter 4

Database Management

4.1 Proving one use-case of indexing efficiency in your scenarios

- **Idea** We will experiment on the 'outpatient' table and insert 1 million records into it. Querying based on the outpatient ID can take a substantial amount of time, possibly extending to a few minutes. Therefore, we are using indexing on the ID field of the 'outpatient' table to improve performance and optimize querying.
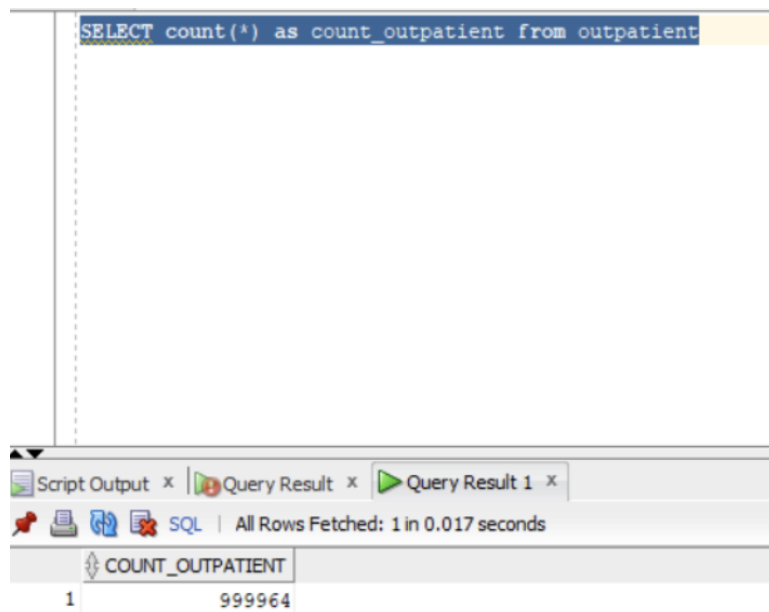

Figure 4.1: *A million of OUTPATIENT RECORD.*

- **Set auto trace**

Figure 4.2: *Set autotrace on.*

- **Indexing**

```
1    CREATE INDEX idx_outpatient_id ON outpatient(ID);
2
```

- **Result**

4.2 Solving one use-case of database security in your scenarios

4.2.1 SQL injection attack

A SQL injection attack happens when a user injects malicious bits of SQL into your database queries. Most commonly, this happens when allowing a user to pass input to a database query without validation which can alter the original intended query. By injecting their own SQL, the user can cause harm by:

- reading sensitive data

- modifying sensitive data

- deleting sensitive data

4.2.2 Examples of SQL injection attacks

The "- -" is the SQL code for a comment. This means that it would then shortcut the rest of the query. So, the invalidated query would look like this.

```
1  SELECT * FROM USERS WHERE USERNAME = 'admin' --' AND PASSWORD =' --'
2
```

Since the part after the "- -" would be ignored, the query that gets executed looks more like this.

```
1  SELECT * FROM USERS WHERE USERNAME = 'admin'
2
```

This could potentially allow an unauthorized user to bypass authentication by exploiting this technique to circumvent password checks, or even drop a table as follows:

```
1  SSELECT * FROM USERS WHERE USERNAME = 'admin'; DROP TABLE EMPLOYEE; --' AND PASSWORD =' --'
2
```

4.2.3 Preventing SQL injection attacks

We have implemented three use-cases to guard against SQL injection attacks in the Express.js server, ensuring authentication rights protection and preventing potentially harmful individuals from infiltrating our database.

1. **Preventing multiple statement execution**

   - **Express code**

   ```
   1      oracledb.createPool({
   2        user: 'asm312',
   3        password: 'vi312',
   4        connectString: 'localhost:1521/XE',
   5        multipleStatements: false
   6      }).then(pool => {
   7        app.listen(PORT, () => {
   8          console.log('Server is running on port 3001');
   9        });
   10
   ```

   - **Explanation** The setting `multipleStatements: false` prevents multiple statements from being executed by default. So, even if the user submits an input that attempts to terminate a query and run a second one, the second one won't run. To emphasize the need for more levels of protection, refer to the example above where injecting a comment (ex. 'user1';–) into the SQL allowed the user to read from private repositories. Since that was done using only one statement, setting `multipleStatements: false` still wouldn't be enough.

2. **Using parameter and binding**

   - **Express code**

   ```
   1      const result = await connection.execute(
   2        'SELECT * FROM USERS WHERE USERNAME = :username AND PASSWORD =:password',
   3        { username, password }
   4      );
   5
   ```

   - **Explanation** In the SQL query above, **:username** and **:password** are parameters bound by the Oracle library. These parameters cannot be altered to carry out SQL injection attacks. Any user-input data will be treated as parameters, preventing the insertion of malicious SQL code into the query.

3. **Validate user input**

- **Express code**

```
 1        const { username, password } = req.body;
 2        const connection = await pool.getConnection();
 3        const lettersNumbersAndSpacePattern = /^[A-Za-z0-9\s]+$/;
 4
 5        if (!username.match(lettersNumbersAndSpacePattern)) {
 6          console.error('Only letters, numbers, and spaces are allowed, no special
          characters!');
 7          return res.status(402).json({ err: 'Only letters, numbers, and spaces are
          allowed, no special characters!' });
 8        }
 9      }
10
11
```

- **Explanation** To prevent **username** from having special characters, **username** should only use capital, lowercase and numbers letters (A-Z, a-z, 0-9).

  This means we can validate that user input matches the correct formatting (no special characters). To do this, we create a regex pattern to match the user input. If it doesn't match, return an error.