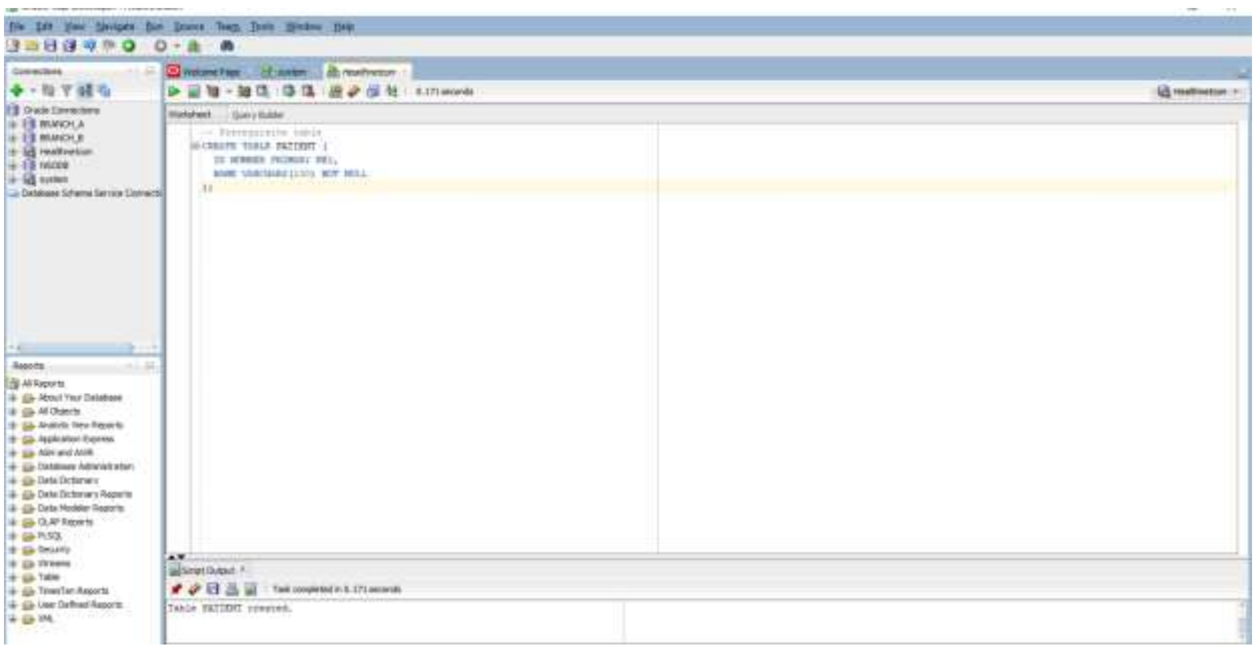
1.

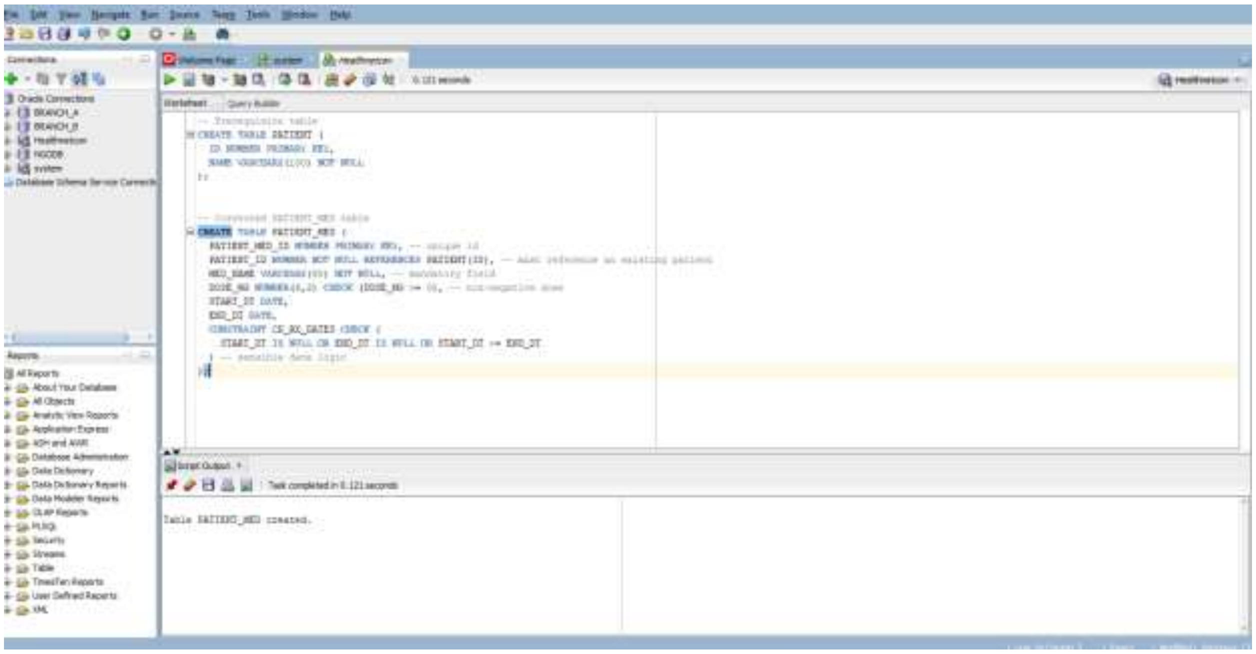
```
-- Prerequisite table
CREATE TABLE PATIENT (
  ID NUMBER PRIMARY KEY,
  NAME VARCHAR2(100) NOT NULL
);
```



```
-- Prerequisite table
CREATE TABLE PATIENT (
  ID NUMBER PRIMARY KEY,
  NAME VARCHAR2(100) NOT NULL
);
```

```
Task completed in 0.171 seconds
Table PATIENT created.
```

```
-- Corrected PATIENT_MED table
CREATE TABLE PATIENT_MED (
  PATIENT_MED_ID NUMBER PRIMARY KEY, -- unique id
  PATIENT_ID NUMBER NOT NULL REFERENCES PATIENT(ID), -- must reference an existing patient
  MED_NAME VARCHAR2(80) NOT NULL, -- mandatory field
  DOSE_MG NUMBER(6,2) CHECK (DOSE_MG >= 0), -- non-negative dose
  START_DT DATE,

  END_DT DATE,

  CONSTRAINT CK_RX_DATES CHECK (

    START_DT IS NULL OR END_DT IS NULL OR START_DT <= END_DT

  ) -- sensible date logic

);
```

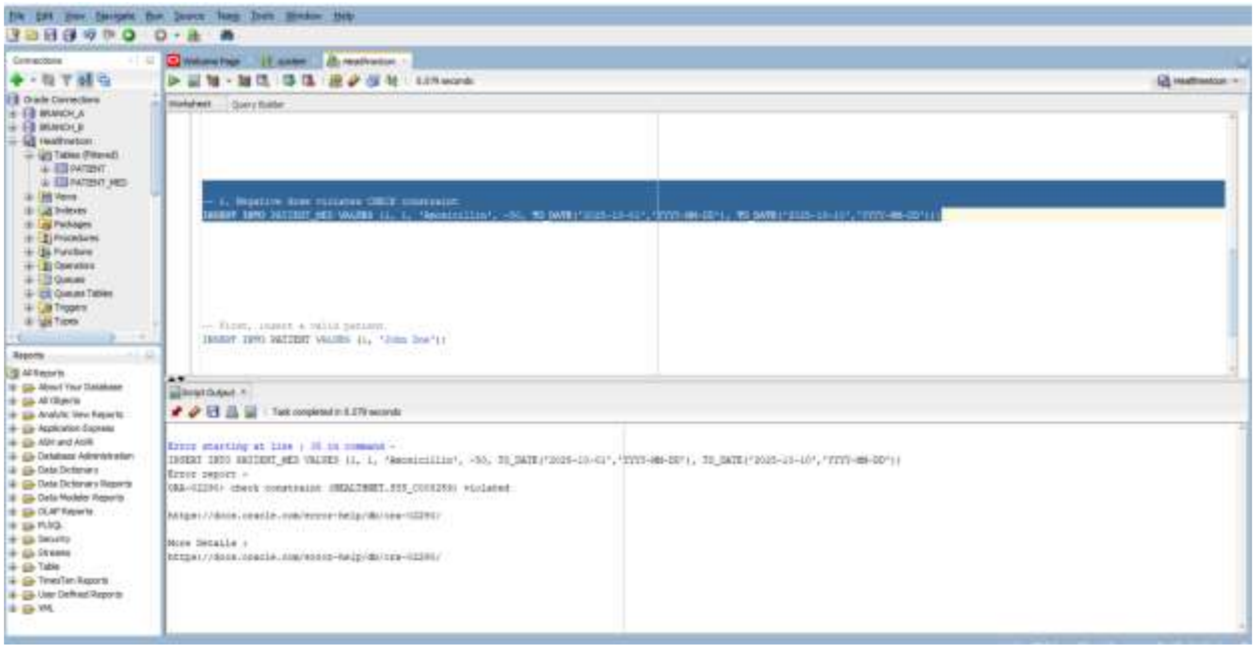


```
-- Prerequisite table
CREATE TABLE PATIENT (
  ID NUMBER PRIMARY KEY,
  NAME VARCHAR2(100) NOT NULL
);


-- Corrected PATIENT_MED table
CREATE TABLE PATIENT_MED (
  PATIENT_MED_ID NUMBER PRIMARY KEY, -- unique id
  PATIENT_ID NUMBER NOT NULL REFERENCES PATIENT(ID), -- must reference an existing patient
  MED_NAME VARCHAR2(80) NOT NULL, -- mandatory field
  DOSE_MG NUMBER(6,2) CHECK (DOSE_MG >= 0), -- non-negative dose
  START_DT DATE,
  END_DT DATE,
  CONSTRAINT CK_RX_DATES CHECK (
    START_DT IS NULL OR END_DT IS NULL OR START_DT <= END_DT
  ) -- sensible date logic
);
```

```
Table PATIENT_MED created.
```

-- 1. Negative dose violates CHECK constraint

INSERT INTO PATIENT_MED VALUES (1, 1, 'Amoxicillin', -50, TO_DATE('2025-10-01','YYYY-MM-DD'), TO_DATE('2025-10-10','YYYY-MM-DD'));

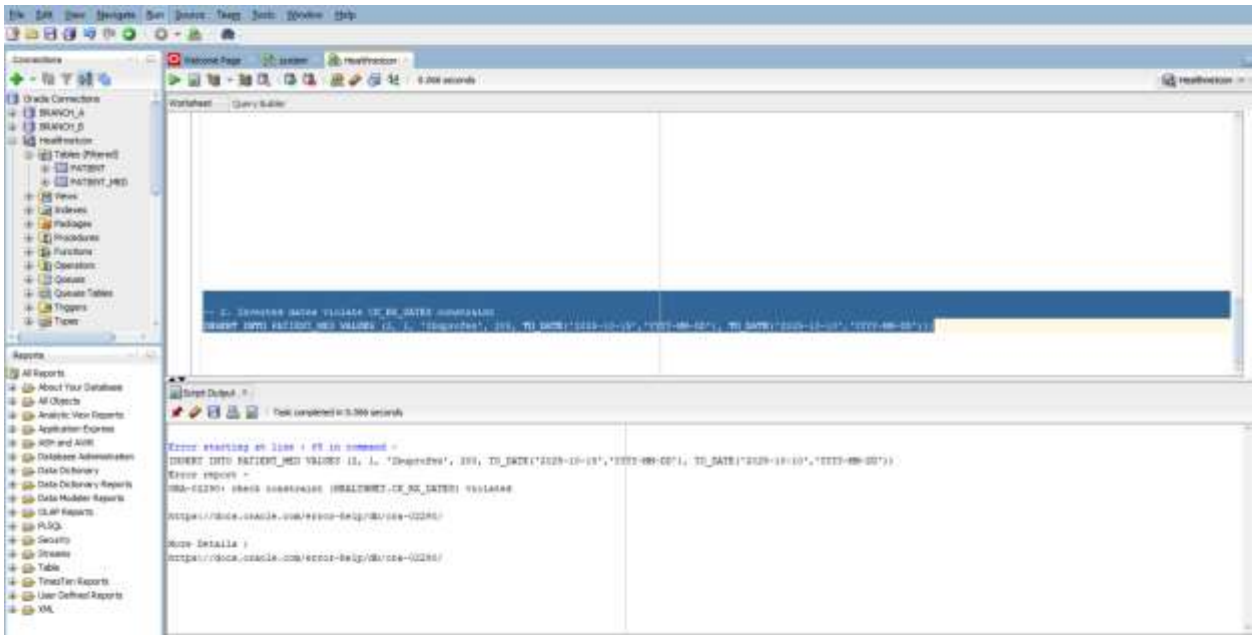


```
-- 1. Negative dose violates CHECK constraint
INSERT INTO PATIENT_MED VALUES (1, 1, 'Amoxicillin', -50, TO_DATE('2025-10-01','YYYY-MM-DD'), TO_DATE('2025-10-10','YYYY-MM-DD'));

-- First, insert a valid patient
INSERT INTO PATIENT VALUES (1, 'John Doe');
```

```
Error starting at line : [illegible] in command -
INSERT INTO PATIENT_MED VALUES (1, 1, 'Amoxicillin', -50, TO_DATE('2025-10-01','YYYY-MM-DD'), TO_DATE('2025-10-10','YYYY-MM-DD'))
Error report -
ORA-02290: check constraint (HEALTHNET.SYS_C[illegible]) violated

https://docs.oracle.com/error-help/db/ora-02290/

More Details :
https://docs.oracle.com/error-help/db/ora-02290/
```

-- 2. Inverted dates violate CK_RX_DATES constraint

INSERT INTO PATIENT_MED VALUES (2, 1, 'Ibuprofen', 200, TO_DATE('2025-10-15','YYYY-MM-DD'), TO_DATE('2025-10-10','YYYY-MM-DD'));

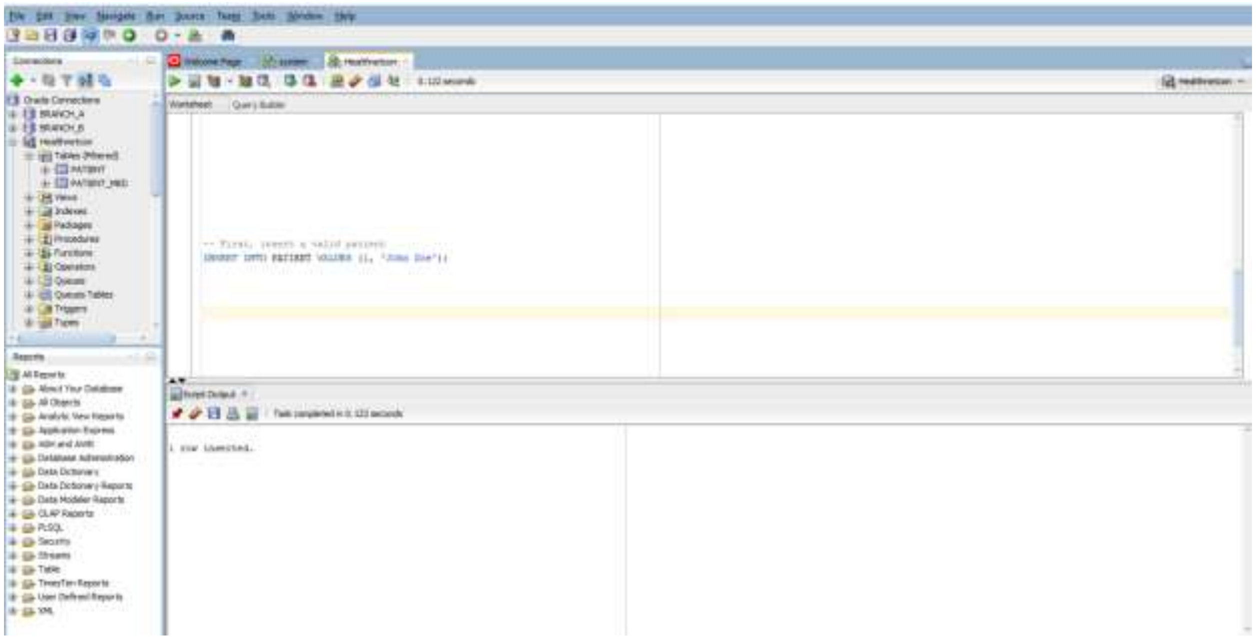


```
-- 2. Inverted dates violate CK_RX_DATES constraint
INSERT INTO PATIENT_MED VALUES (2, 1, 'Ibuprofen', 200, TO_DATE('2025-10-15','YYYY-MM-DD'), TO_DATE('2025-10-10','YYYY-MM-DD'));
```

```
Error starting at line : [illegible] in command -
INSERT INTO PATIENT_MED VALUES (2, 1, 'Ibuprofen', 200, TO_DATE('2025-10-15','YYYY-MM-DD'), TO_DATE('2025-10-10','YYYY-MM-DD'))
Error report -
ORA-02290: check constraint (HEALTHNET.CK_RX_DATES) violated

https://docs.oracle.com/error-help/db/ora-02290/

More Details :
https://docs.oracle.com/error-help/db/ora-02290/
```

-- First, insert a valid patient

INSERT INTO PATIENT VALUES (1, 'John Doe');

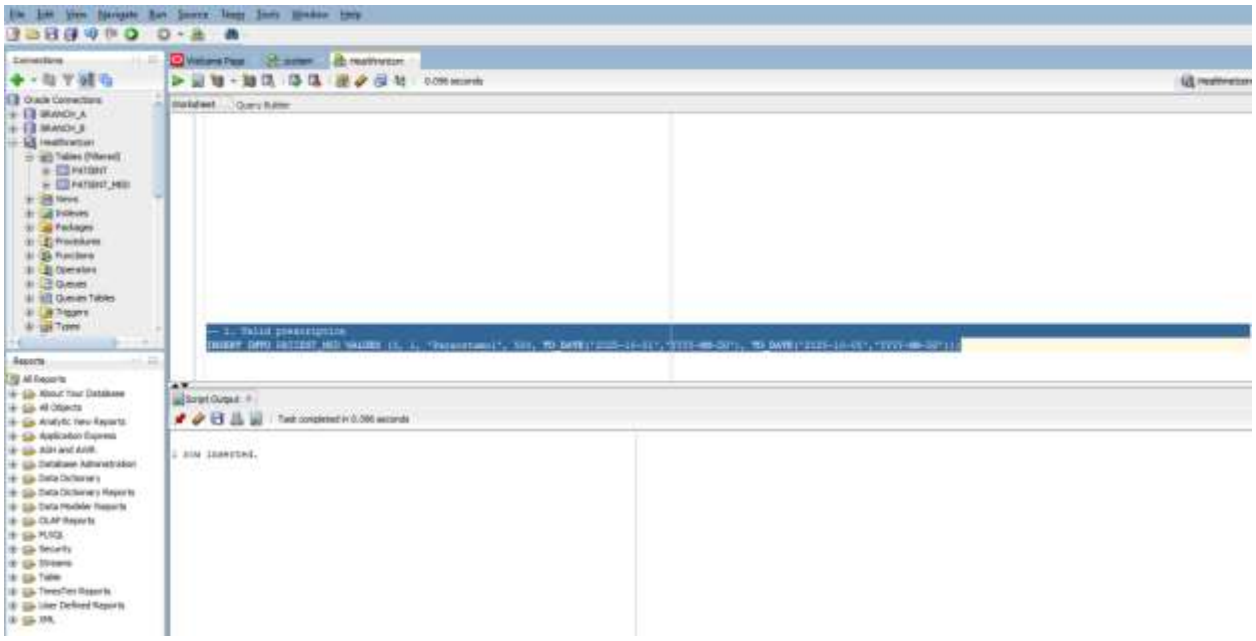


```
-- First, insert a valid patient
INSERT INTO PATIENT VALUES (1, 'John Doe');
```

```
1 row inserted.
```

-- 1. Valid prescription

INSERT INTO PATIENT_MED VALUES (3, 1, 'Paracetamol', 500, TO_DATE('2025-10-01','YYYY-MM-DD'), TO_DATE('2025-10-05','YYYY-MM-DD'));

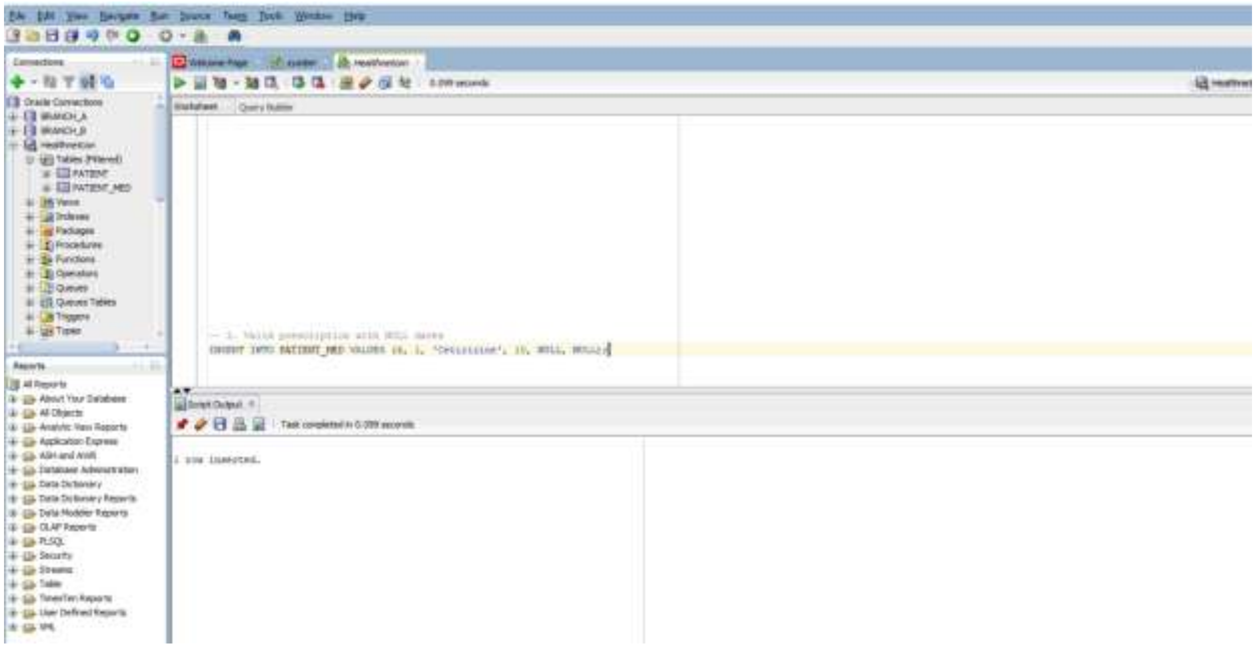


```
-- 1. Valid prescription
INSERT INTO PATIENT_MED VALUES (1, 1, 'Paracetamol', 500, TO_DATE('2025-10-01','YYYY-MM-DD'), TO_DATE('2025-10-05','YYYY-MM-DD'));
```

```
Task completed in 0.066 seconds

1 row inserted.
```

-- 2. Valid prescription with NULL dates

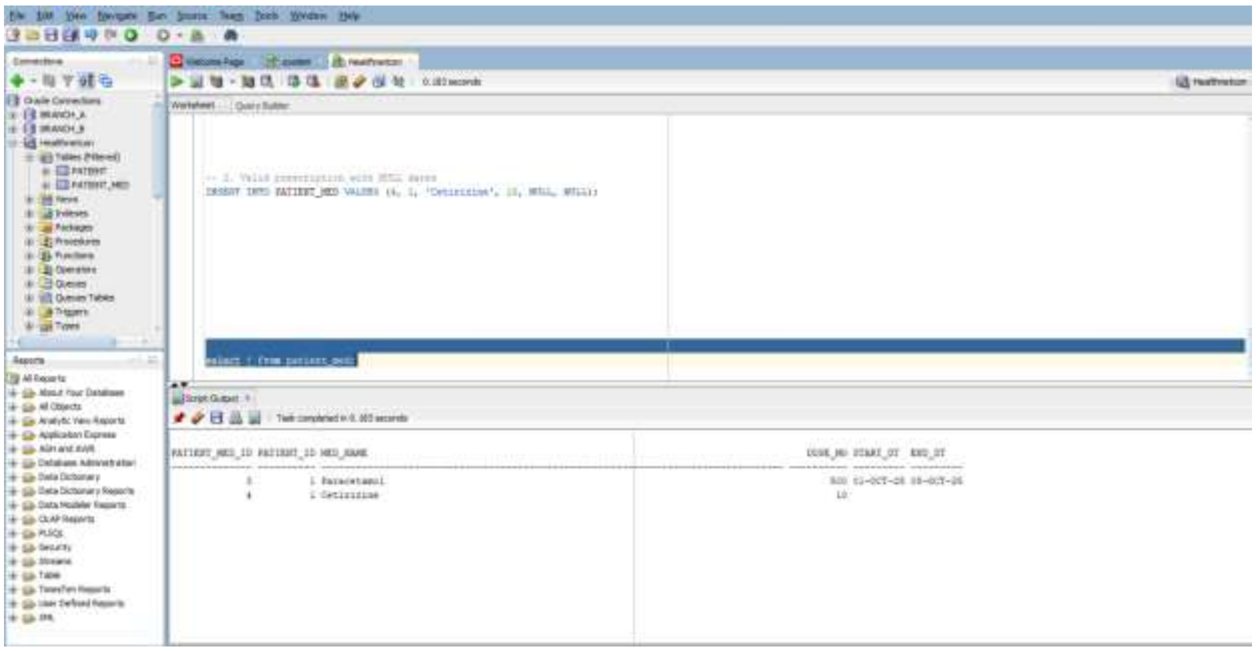
INSERT INTO PATIENT_MED VALUES (4, 1, 'Cetirizine', 10, NULL, NULL);



```
-- 2. Valid prescription with NULL dates
INSERT INTO PATIENT_MED VALUES (4, 1, 'Cetirizine', 10, NULL, NULL);
```

```
Task completed in 0.099 seconds

1 row inserted.
```

select * from patient_med;



```
-- 2. Valid prescription with NULL dates
INSERT INTO PATIENT_MED VALUES (4, 1, 'Cetirizine', 10, NULL, NULL);

select * from patient_med;
```

Task completed in 0.183 seconds

```
PATIENT_MED_ID PATIENT_ID MED_NAME                                                                          DOSE_MG START_DT  END_DT
-------------- ---------- --------------------------------------------------------------------------------- ------- --------- ---------
             3          1 Paracetamol                                                                           500 01-OCT-25 05-OCT-25
             4          1 Cetirizine                                                                             10
```

Error Type	Buggy Code	Correction	Explanation
Missing commas	No commas between column definitions	Added commas between each column definition	SQL requires commas to separate columns in a `CREATE TABLE` statement
Missing NOT NULL	`MED_NAME VARCHAR2(80)`	`MED_NAME VARCHAR2(80) NOT NULL`	Ensures `MED_NAME` is mandatory
Malformed CHECK clause	`DOSE_MG NUMBER(6,2) CHECK DOSE_MG >= 0`	`DOSE_MG NUMBER(6,2) CHECK (DOSE_MG >= 0)`	CHECK constraints must be enclosed in parentheses
Invalid date logic	`CHECK (START_DT <= END_DT WHEN BOTH NOT NULL)`	`CHECK (START_DT IS NULL OR END_DT IS NULL OR START_DT <= END_DT)`	SQL doesn't support "WHEN BOTH NOT NULL"; use logical OR to allow NULLs
Missing NOT NULL on FK	`PATIENT_ID NUMBER REFERENCES PATIENT(ID)`	`PATIENT_ID NUMBER NOT NULL REFERENCES PATIENT(ID)`	Ensures foreign key is mandatory

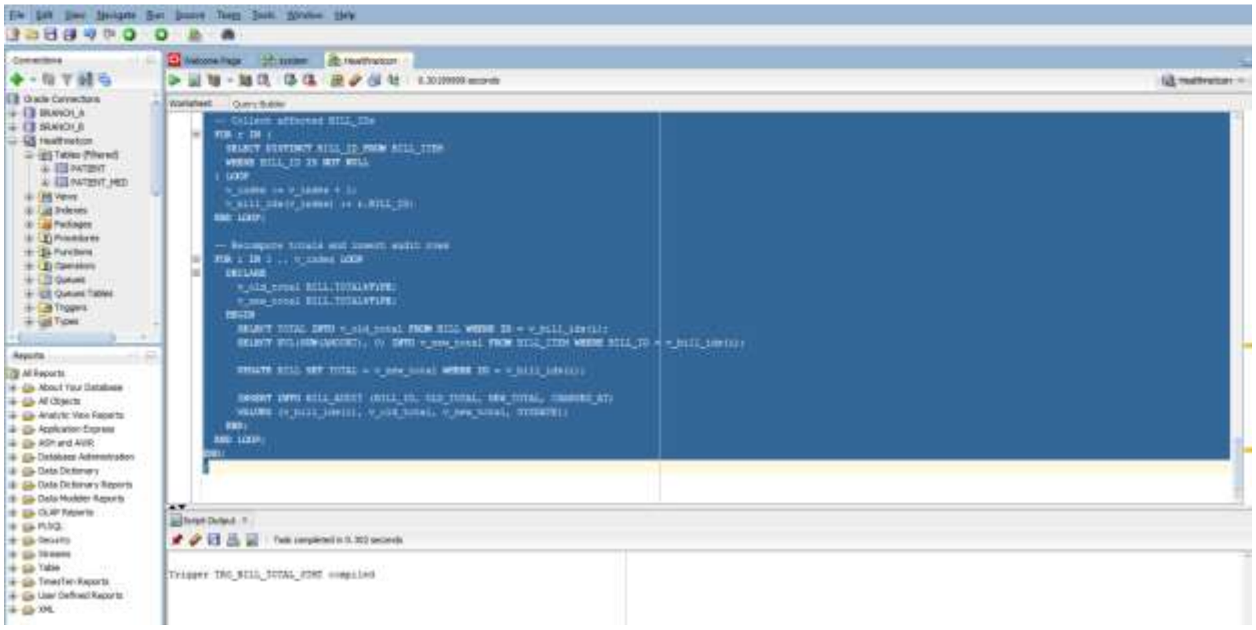
Error Type	Buggy Code	Correction	Explanation

2. -- Main bill table

```
CREATE TABLE BILL (
  ID NUMBER PRIMARY
KEY,
  TOTAL NUMBER(12,2)
);

-- Items linked to bills
CREATE TABLE
BILL_ITEM (
  BILL_ID NUMBER,
  AMOUNT NUMBER(12,2),
  UPDATED_AT DATE,
  CONSTRAINT
FK_BILL_ITEM_BILL
FOREIGN KEY (BILL_ID)
REFERENCES BILL(ID)
);

-- Audit log for changes
CREATE TABLE
BILL_AUDIT (
  BILL_ID NUMBER,
  OLD_TOTAL
NUMBER(12,2),
  NEW_TOTAL
NUMBER(12,2),
  CHANGED_AT DATE
);
```

Correct Compound Trigger: `TRG_BILL_TOTAL_CMP`: it updates `BILL.TOTAL` once per statement and logs changes into `BILL_AUDIT`, avoiding mutating-table errors and redundant updates.

```
CREATE OR REPLACE TRIGGER TRG_BILL_TOTAL_STMT

AFTER INSERT OR UPDATE OR DELETE ON BILL_ITEM

DECLARE

  TYPE bill_id_table IS TABLE OF BILL_ITEM.BILL_ID%TYPE INDEX BY PLS_INTEGER;

  v_bill_ids bill_id_table;

  v_index PLS_INTEGER := 0;

BEGIN

  -- Collect affected BILL_IDs

  FOR r IN (

    SELECT DISTINCT BILL_ID FROM BILL_ITEM

    WHERE BILL_ID IS NOT NULL

  ) LOOP

    v_index := v_index + 1;

    v_bill_ids(v_index) := r.BILL_ID;

  END LOOP;


  -- Recompute totals and insert audit rows

  FOR i IN 1 .. v_index LOOP

    DECLARE

      v_old_total BILL.TOTAL%TYPE;

      v_new_total BILL.TOTAL%TYPE;

    BEGIN

      SELECT TOTAL INTO v_old_total FROM BILL WHERE ID = v_bill_ids(i);

      SELECT NVL(SUM(AMOUNT), 0) INTO v_new_total FROM BILL_ITEM WHERE BILL_ID = v_bill_ids(i);
      UPDATE BILL SET TOTAL = v_new_total WHERE ID = v_bill_ids(i);


      INSERT INTO BILL_AUDIT (BILL_ID, OLD_TOTAL, NEW_TOTAL, CHANGED_AT)
      VALUES (v_bill_ids(i), v_old_total, v_new_total, SYSDATE);
    END;
  END LOOP;
END;
/
```

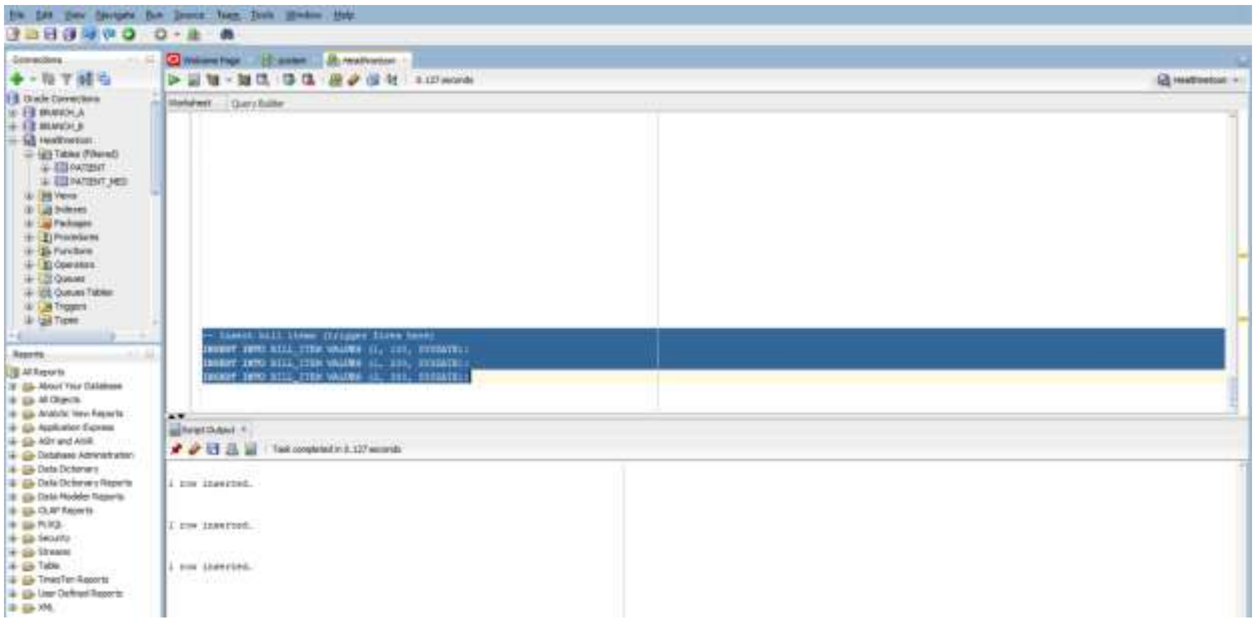


```
-- Collect affected BILL_IDs
FOR r IN (
  SELECT DISTINCT BILL_ID FROM BILL_ITEM
  WHERE BILL_ID IS NOT NULL
) LOOP
  v_index := v_index + 1;
  v_bill_ids(v_index) := r.BILL_ID;
END LOOP;

-- Recompute totals and insert audit rows
FOR i IN 1 .. v_index LOOP
  DECLARE
    v_old_total BILL.TOTAL%TYPE;
    v_new_total BILL.TOTAL%TYPE;
  BEGIN
    SELECT TOTAL INTO v_old_total FROM BILL WHERE ID = v_bill_ids(i);
    SELECT NVL(SUM(AMOUNT), 0) INTO v_new_total FROM BILL_ITEM WHERE BILL_ID = v_bill_ids(i);

    UPDATE BILL SET TOTAL = v_new_total WHERE ID = v_bill_ids(i);

    INSERT INTO BILL_AUDIT (BILL_ID, OLD_TOTAL, NEW_TOTAL, CHANGED_AT)
    VALUES (v_bill_ids(i), v_old_total, v_new_total, SYSDATE);
  END;
END LOOP;
END;
```

Task completed in 0.302 seconds

```
Trigger TRG_BILL_TOTAL_STMT compiled
```

```
-- Insert bill items (trigger fires here)
INSERT INTO BILL_ITEM VALUES (1, 100, SYSDATE);
INSERT INTO BILL_ITEM VALUES (1, 200, SYSDATE);
INSERT INTO BILL_ITEM VALUES (2, 300, SYSDATE);
```



```
-- Insert bill items (trigger fires here)
INSERT INTO BILL_ITEM VALUES (1, 100, SYSDATE);
INSERT INTO BILL_ITEM VALUES (1, 200, SYSDATE);
INSERT INTO BILL_ITEM VALUES (2, 300, SYSDATE);
```

Task completed in 0.127 seconds

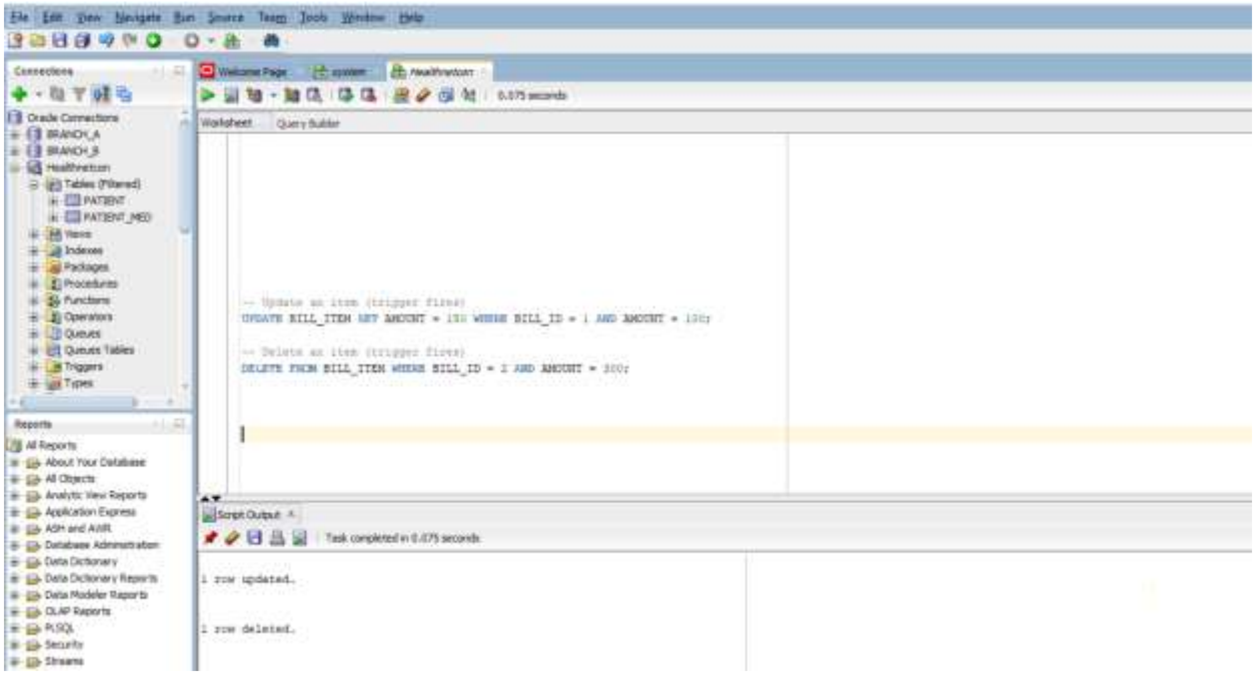
```
1 row inserted.

1 row inserted.

1 row inserted.
```

-- Update an item (trigger fires)

UPDATE BILL_ITEM SET AMOUNT = 150 WHERE BILL_ID = 1 AND AMOUNT = 100;

-- Delete an item (trigger fires)

DELETE FROM BILL_ITEM WHERE BILL_ID = 2 AND AMOUNT = 300;



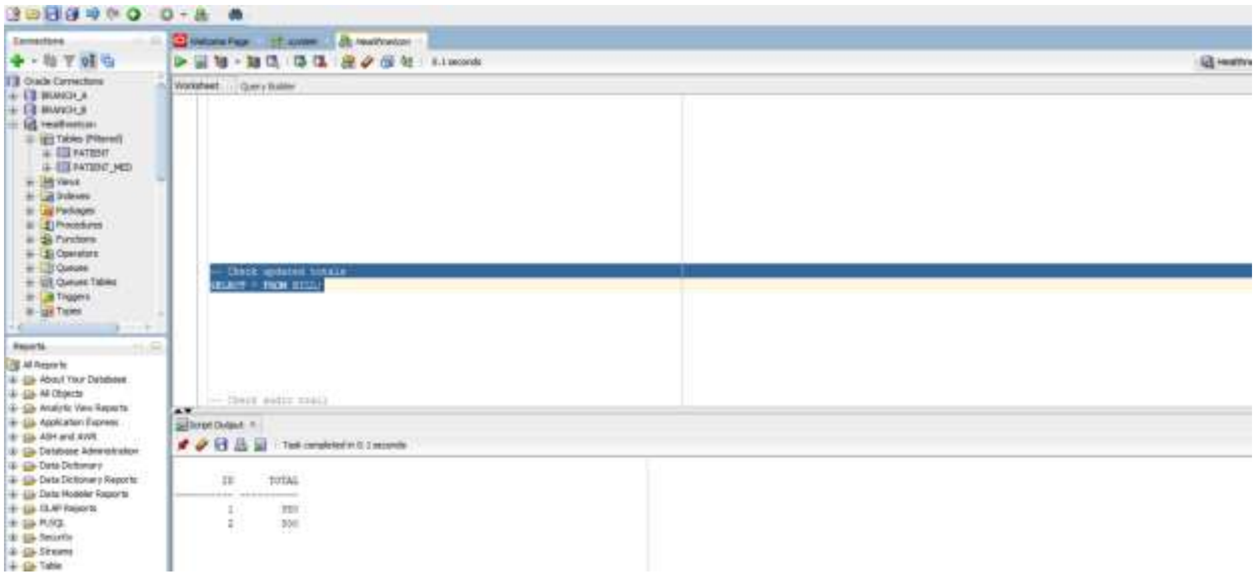
```
-- Update an item (trigger fires)
UPDATE BILL_ITEM SET AMOUNT = 150 WHERE BILL_ID = 1 AND AMOUNT = 100;

-- Delete an item (trigger fires)
DELETE FROM BILL_ITEM WHERE BILL_ID = 2 AND AMOUNT = 300;
```

Task completed in 0.075 seconds

```
1 row updated.

1 row deleted.
```

-- Check updated totals

SELECT * FROM BILL;



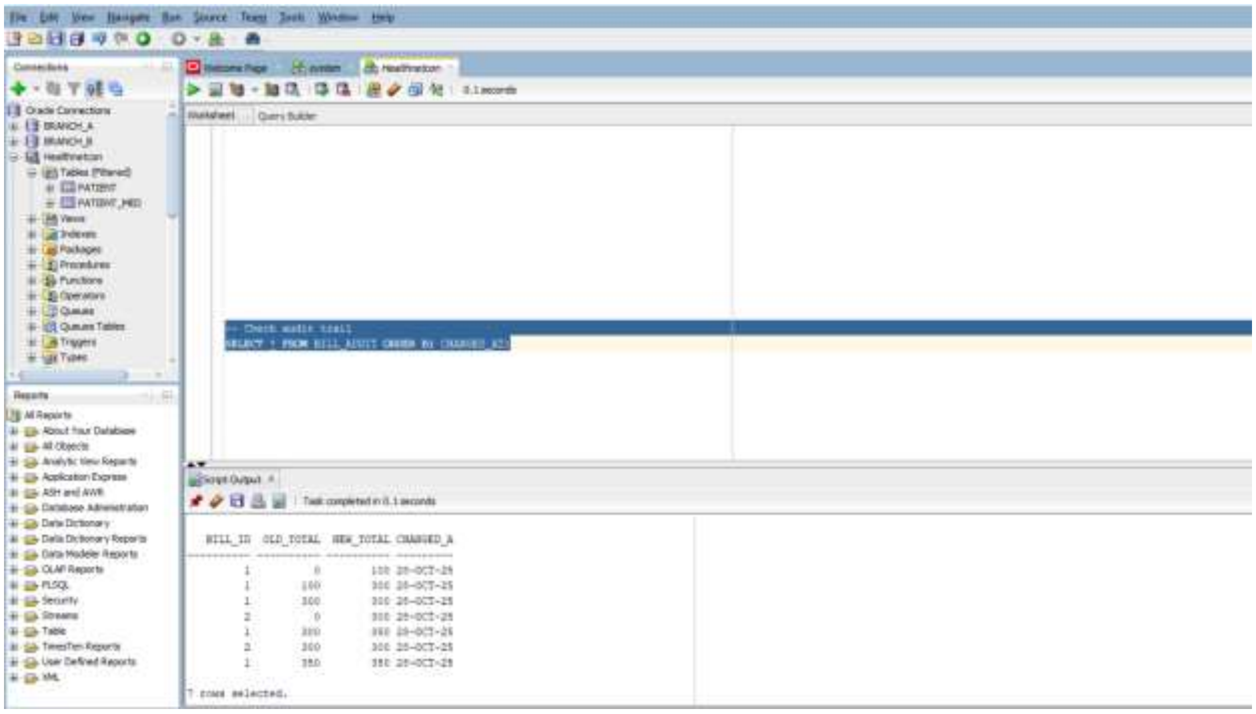
```
-- Check updated totals
SELECT * FROM BILL;
```

Task completed in 0.1 seconds

```
        ID      TOTAL
---------- ----------
         1 [illegible]
         2        300
```

-- Check audit trail

SELECT * FROM BILL_AUDIT ORDER BY CHANGED_AT;



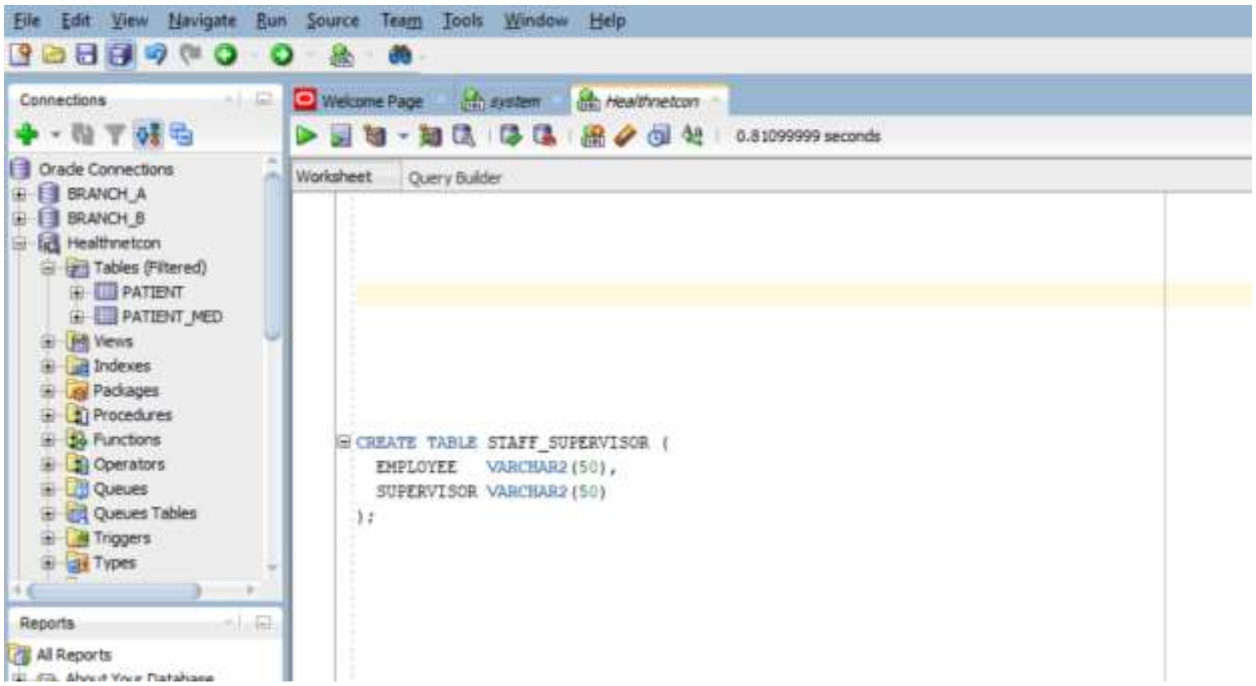
```
-- Check audit trail
SELECT * FROM BILL_AUDIT ORDER BY CHANGED_AT;
```

Task completed in 0.1 seconds

```
   BILL_ID  OLD_TOTAL  NEW_TOTAL CHANGED_A
---------- ---------- ---------- ---------
         1          0        100 25-OCT-25
         1        100        300 25-OCT-25
         1        300        300 25-OCT-25
         2          0        300 25-OCT-25
         1        300        350 25-OCT-25
         2        300        300 25-OCT-25
         1        350        350 25-OCT-25

7 rows selected.
```

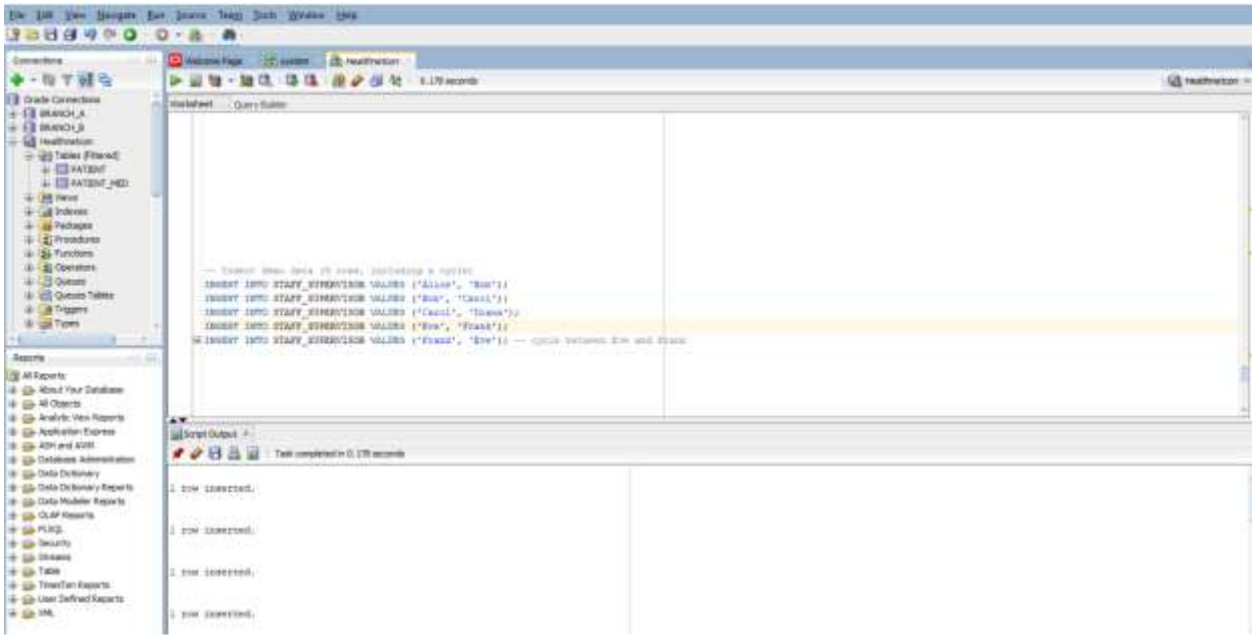
- `BILL.TOTAL` for ID 1 should reflect the sum of its items (e.g., 150 + 200 = 350).
- `BILL.TOTAL` for ID 2 should be 0 after deletion.
- `BILL_AUDIT` should show old and new totals for each change.

3.



```
CREATE TABLE STAFF_SUPERVISOR (
  EMPLOYEE   VARCHAR2(50),
  SUPERVISOR VARCHAR2(50)
);
```

Inserting rows

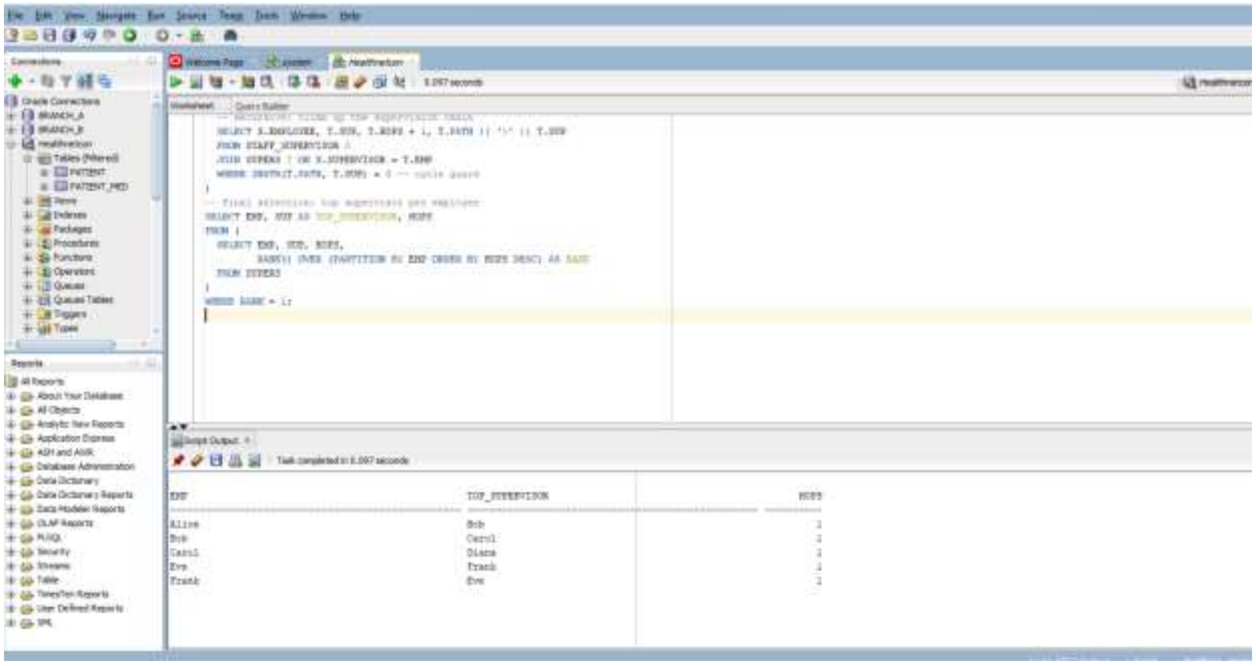


```
-- Insert demo data (5 rows, including a cycle)
INSERT INTO STAFF_SUPERVISOR VALUES ('Alice', 'Bob');
INSERT INTO STAFF_SUPERVISOR VALUES ('Bob', 'Carol');
INSERT INTO STAFF_SUPERVISOR VALUES ('Carol', 'Diana');
INSERT INTO STAFF_SUPERVISOR VALUES ('Eve', 'Frank');
INSERT INTO STAFF_SUPERVISOR VALUES ('Frank', 'Eve'); -- cycle between Eve and Frank
```

```
1 row inserted.

1 row inserted.

1 row inserted.

1 row inserted.
```

-- Corrected recursive query

```
WITH SUPERS (EMP, SUP, HOPS, PATH) AS (
  -- Anchor: start with direct supervision, hop count = 1
  SELECT EMPLOYEE, SUPERVISOR, 1, EMPLOYEE || '>' || SUPERVISOR
  FROM STAFF_SUPERVISOR
  UNION ALL
  -- Recursive: climb up the supervision chain
  SELECT S.EMPLOYEE, T.SUP, T.HOPS + 1, T.PATH || '>' || T.SUP
  FROM STAFF_SUPERVISOR S
  JOIN SUPERS T ON S.SUPERVISOR = T.EMP
  WHERE INSTR(T.PATH, T.SUP) = 0 -- cycle guard
)
-- Final selection: top supervisor per employee
SELECT EMP, SUP AS TOP_SUPERVISOR, HOPS
FROM (
  SELECT EMP, SUP, HOPS,
        RANK() OVER (PARTITION BY EMP ORDER BY HOPS DESC) AS RANK
  FROM SUPERS
)
WHERE RANK = 1;
```



```
  -- Recursive: climb up the supervision chain
  SELECT S.EMPLOYEE, T.SUP, T.HOPS + 1, T.PATH || '>' || T.SUP
  FROM STAFF_SUPERVISION S
  JOIN SUPERS T ON S.SUPERVISOR = T.EMP
  WHERE INSTR(T.PATH, T.SUP) = 0 -- cycle guard
)
-- Final selection: top supervisor per employee
SELECT EMP, SUP AS TOP_SUPERVISOR, HOPS
FROM (
  SELECT EMP, SUP, HOPS,
         RANK() OVER (PARTITION BY EMP ORDER BY HOPS DESC) AS RANK
  FROM SUPERS
)
WHERE RANK = 1;
```

```
Task completed in 0.097 seconds

EMP                              TOP_SUPERVISOR                     HOPS
-------------------------------- ---------------------------------- ----
Alice                            Bob                                   1
Bob                              Carol                                 1
Carol                            Diana                                 1
Eve                              Frank                                 1
Frank                            Eve                                   1
```

Bug	Fix
Anchor hop count was `0`	Set to `1` to reflect first supervision step
Join direction was reversed	Corrected to climb up: `S.SUPERVISOR = T.EMP`
Cycle guard was naive	Improved with `INSTR(PATH, T.SUP) = 0`
Scalar subquery with `MAX(HOPS or` the **number of steps** it takes to reach an employee's **top supervisor** by following the chain of supervision`)`	Replaced with `RANK()` analytic function for clarity and correctness

Diana

└── Carol

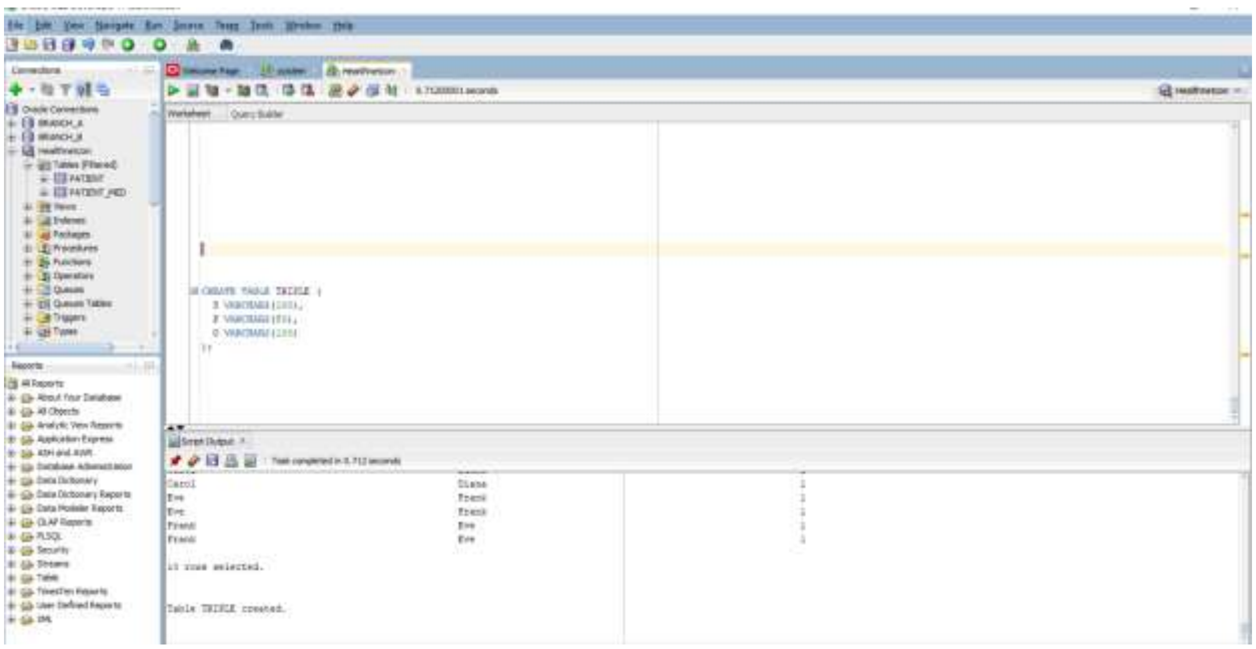
  └── Bob

    └── Alice

Eve ↔ Frank (cycle)

4.

```
CREATE TABLE TRIPLE (

  S VARCHAR2(100),

  P VARCHAR2(50),

  O VARCHAR2(100)

);
```

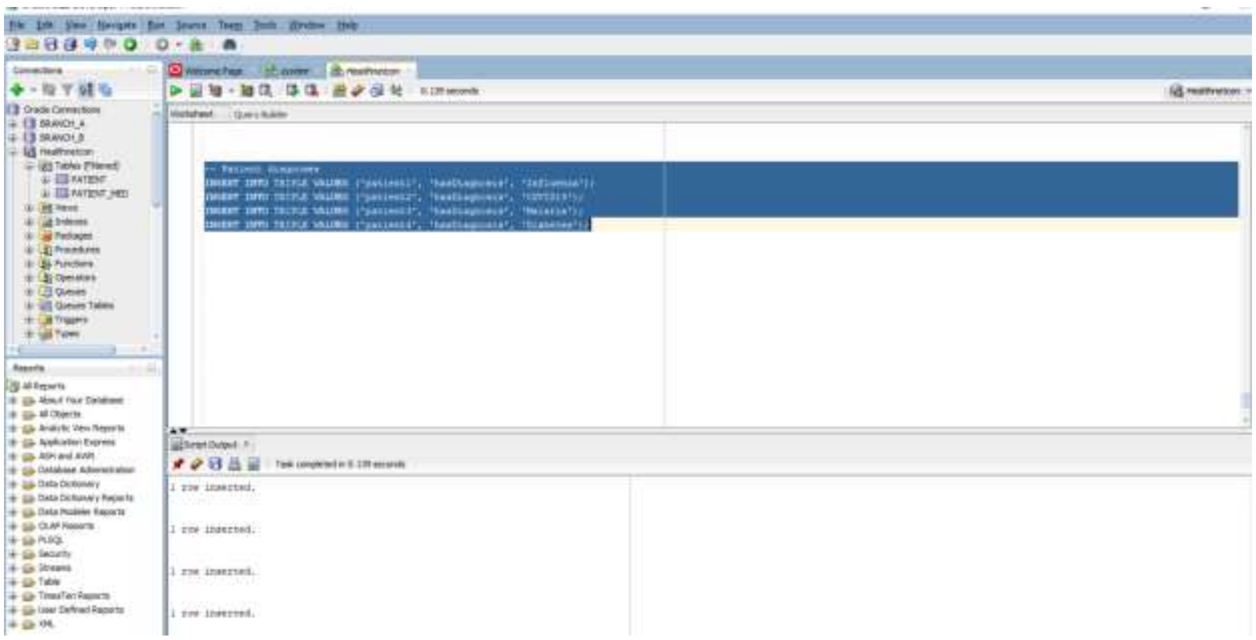


```
CREATE TABLE TRIPLE (
  S VARCHAR2(100),
  P VARCHAR2(50),
  O VARCHAR2(100)
);
```

Task completed in 0.712 seconds

```
Carol                                   Diana                                       1
Eve                                     Frank                                       1
Eve                                     Frank                                       1
Frank                                   Eve                                         1
Frank                                   Eve                                         1

10 rows selected.


Table TRIPLE created.
```

```
-- Patient diagnoses

INSERT INTO TRIPLE VALUES ('patient1', 'hasDiagnosis', 'Influenza');

INSERT INTO TRIPLE VALUES ('patient2', 'hasDiagnosis', 'COVID19');

INSERT INTO TRIPLE VALUES ('patient3', 'hasDiagnosis', 'Malaria');

INSERT INTO TRIPLE VALUES ('patient4', 'hasDiagnosis', 'Diabetes');
```



```
-- Patient diagnoses
INSERT INTO TRIPLE VALUES ('patient1', 'hasDiagnosis', 'Influenza');
INSERT INTO TRIPLE VALUES ('patient2', 'hasDiagnosis', 'COVID19');
INSERT INTO TRIPLE VALUES ('patient3', 'hasDiagnosis', 'Malaria');
INSERT INTO TRIPLE VALUES ('patient4', 'hasDiagnosis', 'Diabetes');
```

```
1 row inserted.


1 row inserted.


1 row inserted.


1 row inserted.
```

-- Taxonomy edges

INSERT INTO TRIPLE VALUES ('Influenza', 'isA', 'ViralInfection');

INSERT INTO TRIPLE VALUES ('COVID19', 'isA', 'ViralInfection');

INSERT INTO TRIPLE VALUES ('Malaria', 'isA', 'ParasiticInfection');

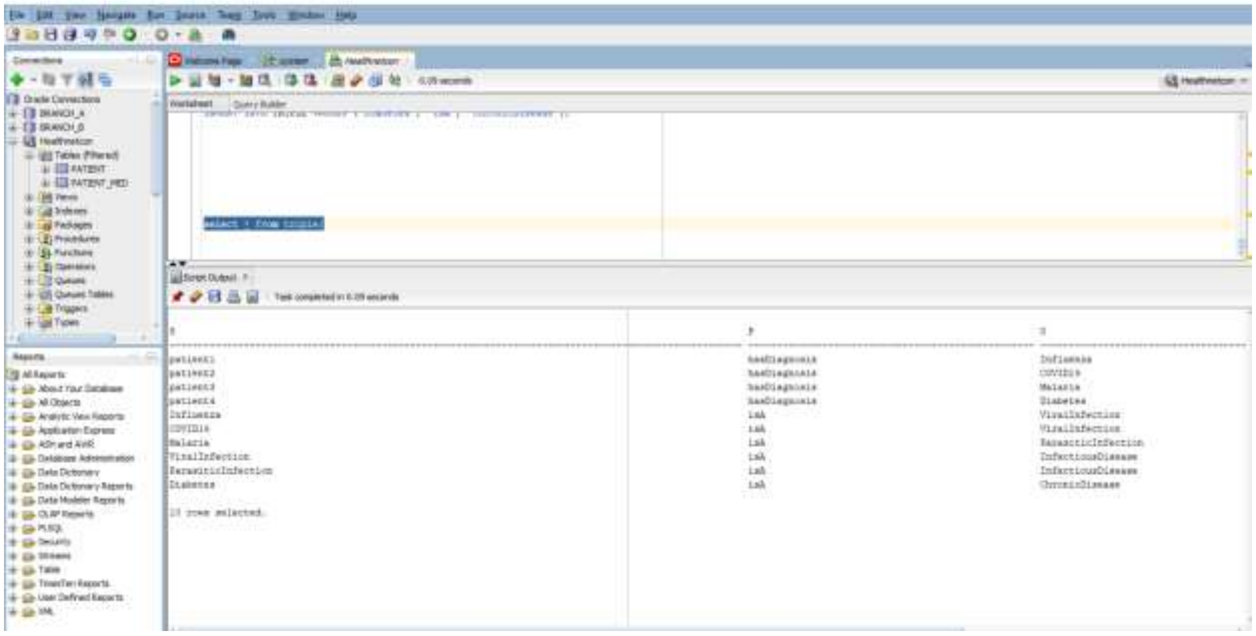
INSERT INTO TRIPLE VALUES ('ViralInfection', 'isA', 'InfectiousDisease');

INSERT INTO TRIPLE VALUES ('ParasiticInfection', 'isA', 'InfectiousDisease');

INSERT INTO TRIPLE VALUES ('Diabetes', 'isA', 'ChronicDisease');

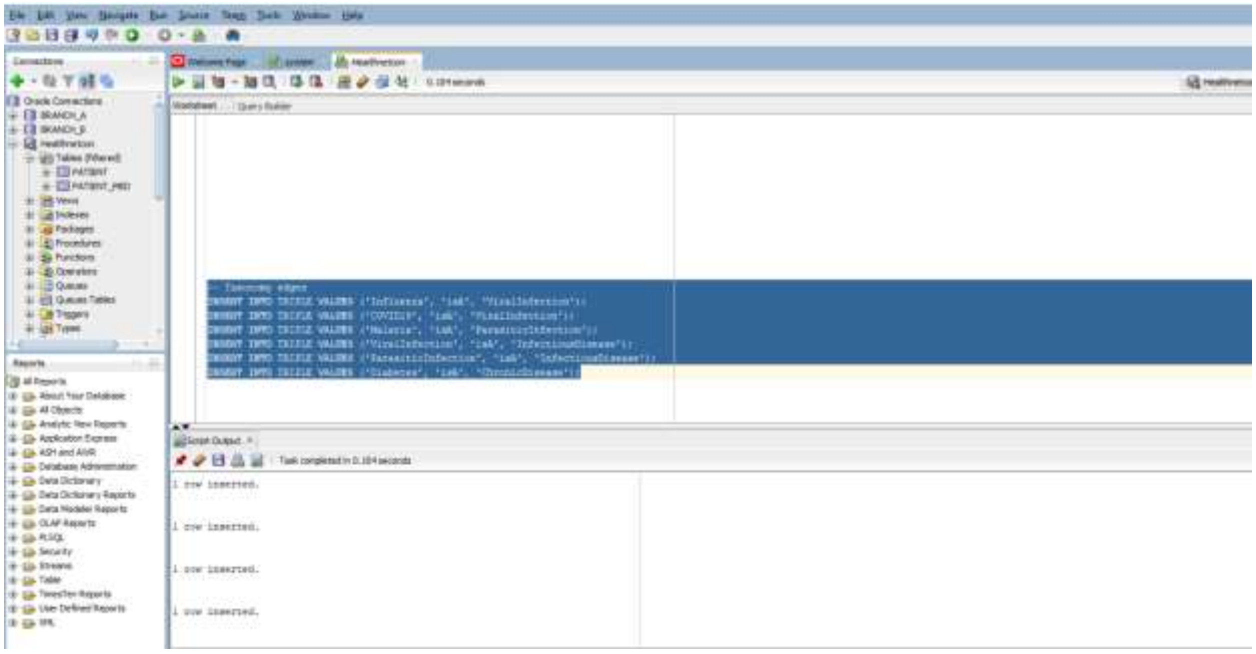
Check inserted rows;

select * from triple;



```
select * from triple;
```

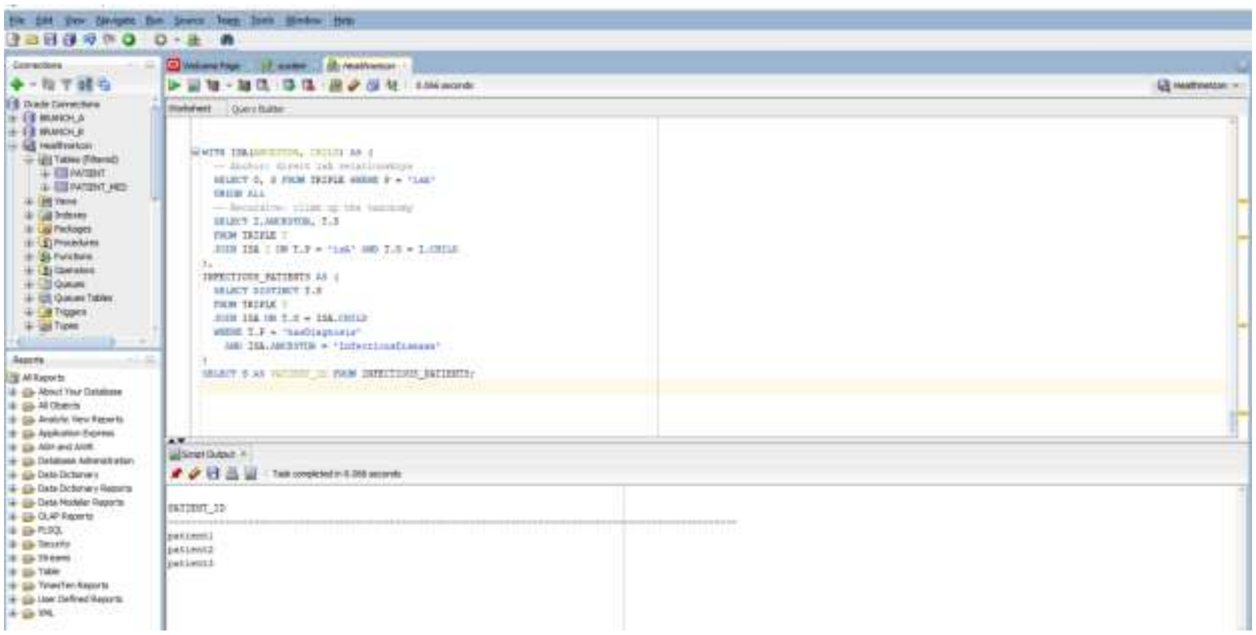
```
S                                    P                    O
------------------------------------ -------------------- --------------------
patient1                             hasDiagnosis         Influenza
patient2                             hasDiagnosis         COVID19
patient3                             hasDiagnosis         Malaria
patient4                             hasDiagnosis         Diabetes
Influenza                            isA                  ViralInfection
COVID19                              isA                  ViralInfection
Malaria                              isA                  ParasiticInfection
ViralInfection                       isA                  InfectiousDisease
ParasiticInfection                   isA                  InfectiousDisease
Diabetes                             isA                  ChronicDisease

10 rows selected.
```



```
-- Taxonomy edges
INSERT INTO TRIPLE VALUES ('Influenza', 'isA', 'ViralInfection');
INSERT INTO TRIPLE VALUES ('COVID19', 'isA', 'ViralInfection');
INSERT INTO TRIPLE VALUES ('Malaria', 'isA', 'ParasiticInfection');
INSERT INTO TRIPLE VALUES ('ViralInfection', 'isA', 'InfectiousDisease');
INSERT INTO TRIPLE VALUES ('ParasiticInfection', 'isA', 'InfectiousDisease');
INSERT INTO TRIPLE VALUES ('Diabetes', 'isA', 'ChronicDisease');
```

```
1 row inserted.

1 row inserted.

1 row inserted.

1 row inserted.
```

```
WITH ISA(ANCESTOR, CHILD) AS (
  -- Anchor: direct isA relationships
  SELECT O, S FROM TRIPLE WHERE P = 'isA'
  UNION ALL
  -- Recursive: climb up the taxonomy
  SELECT I.ANCESTOR, T.S
  FROM TRIPLE T
  JOIN ISA I ON T.P = 'isA' AND T.O = I.CHILD
),
INFECTIOUS_PATIENTS AS (
  SELECT DISTINCT T.S
  FROM TRIPLE T
  JOIN ISA ON T.O = ISA.CHILD
  WHERE T.P = 'hasDiagnosis'
    AND ISA.ANCESTOR = 'InfectiousDisease'
)
SELECT S AS PATIENT_ID FROM INFECTIOUS_PATIENTS;
```



```
WITH ISA(ANCESTOR, CHILD) AS (
  -- Anchor: direct isA relationships
  SELECT O, S FROM TRIPLE WHERE P = 'isA'
  UNION ALL
  -- Recursive: climb up the taxonomy
  SELECT I.ANCESTOR, T.S
  FROM TRIPLE T
  JOIN ISA I ON T.P = 'isA' AND T.O = I.CHILD
),
INFECTIOUS_PATIENTS AS (
  SELECT DISTINCT T.S
  FROM TRIPLE T
  JOIN ISA ON T.O = ISA.CHILD
  WHERE T.P = 'hasDiagnosis'
    AND ISA.ANCESTOR = 'InfectiousDisease'
)
SELECT S AS PATIENT_ID FROM INFECTIOUS_PATIENTS;
```

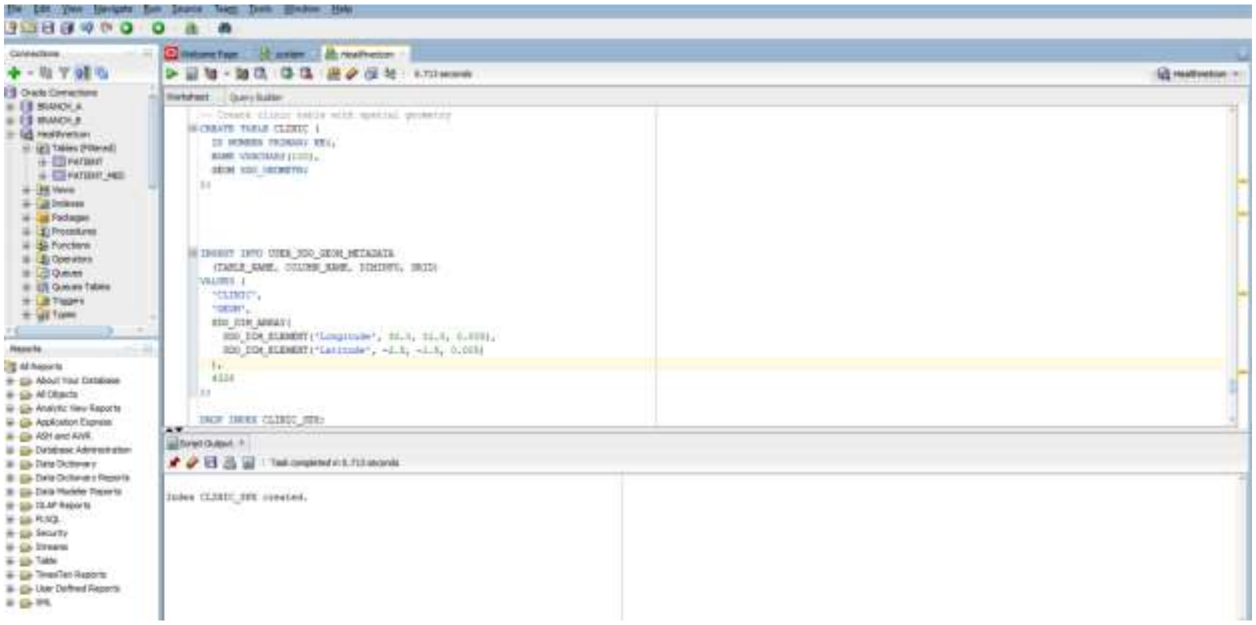
```
PATIENT_ID
--------------------------------------------------------------------------------
patient1
patient2
patient3
```

- Represent facts in a flexible, searchable format

- Link concepts together (like diseases to categories)
- Enable reasoning and inference (e.g., if Influenza is an InfectiousDisease, then patient1 has an InfectiousDisease)

5.

```
-- Create clinic table with spatial geometry

CREATE TABLE CLINIC (

  ID NUMBER PRIMARY KEY,

  NAME VARCHAR2(100),

  GEOM SDO_GEOMETRY

);




INSERT INTO USER_SDO_GEOM_METADATA

  (TABLE_NAME, COLUMN_NAME, DIMINFO, SRID)

VALUES (

  'CLINIC',

  'GEOM',

  SDO_DIM_ARRAY(

    SDO_DIM_ELEMENT('Longitude', 30.0, 31.0, 0.005),
   SDO_DIM_ELEMENT('Latitude', -2.5, -1.5, 0.005)
  ),
  4326
);
```

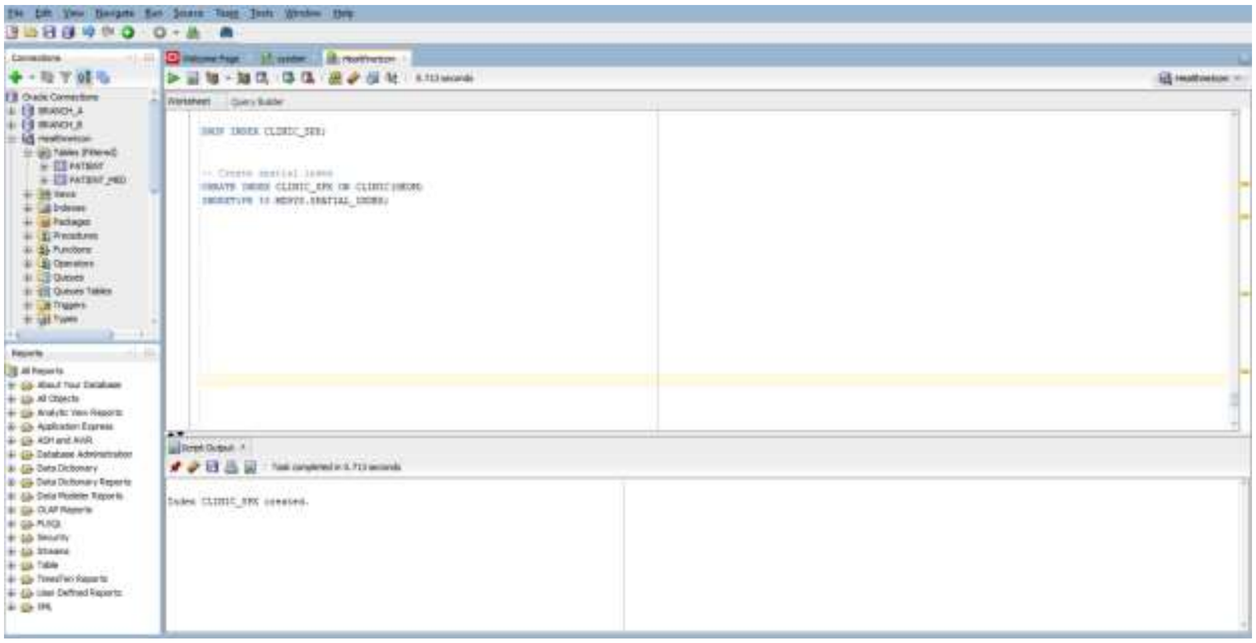


```
-- Create clinic table with spatial geometry
CREATE TABLE CLINIC (
  ID NUMBER PRIMARY KEY,
  NAME VARCHAR2(100),
  GEOM SDO_GEOMETRY
);



INSERT INTO USER_SDO_GEOM_METADATA
  (TABLE_NAME, COLUMN_NAME, DIMINFO, SRID)
VALUES (
  'CLINIC',
  'GEOM',
  SDO_DIM_ARRAY(
   SDO_DIM_ELEMENT('Longitude', [illegible], [illegible], 0.005),
   SDO_DIM_ELEMENT('Latitude', -2.5, -1.5, 0.005)
  ),
  4326
);

DROP INDEX CLINIC_SPX;
```

Task completed in 0.713 seconds

```
Index CLINIC_SPX created.
```

```
-- Create spatial index
CREATE INDEX CLINIC_SPX ON CLINIC(GEOM)
INDEXTYPE IS MDSYS.SPATIAL_INDEX;
```



```
DROP INDEX CLINIC_SPX;

-- Create spatial index
CREATE INDEX CLINIC_SPX ON CLINIC(GEOM)
INDEXTYPE IS MDSYS.SPATIAL_INDEX;
```

Task completed in 0.713 seconds

```
Index CLINIC_SPX created.
```

-- Ambulance is at (30.0600, -1.9570)

INSERT INTO CLINIC VALUES (

  1, 'Kigali Central Clinic',

  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0610, -1.9575, NULL), NULL, NULL)

);

INSERT INTO CLINIC VALUES (

  2, 'Nyamirambo Health Center',

  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0595, -1.9560, NULL), NULL, NULL)

);

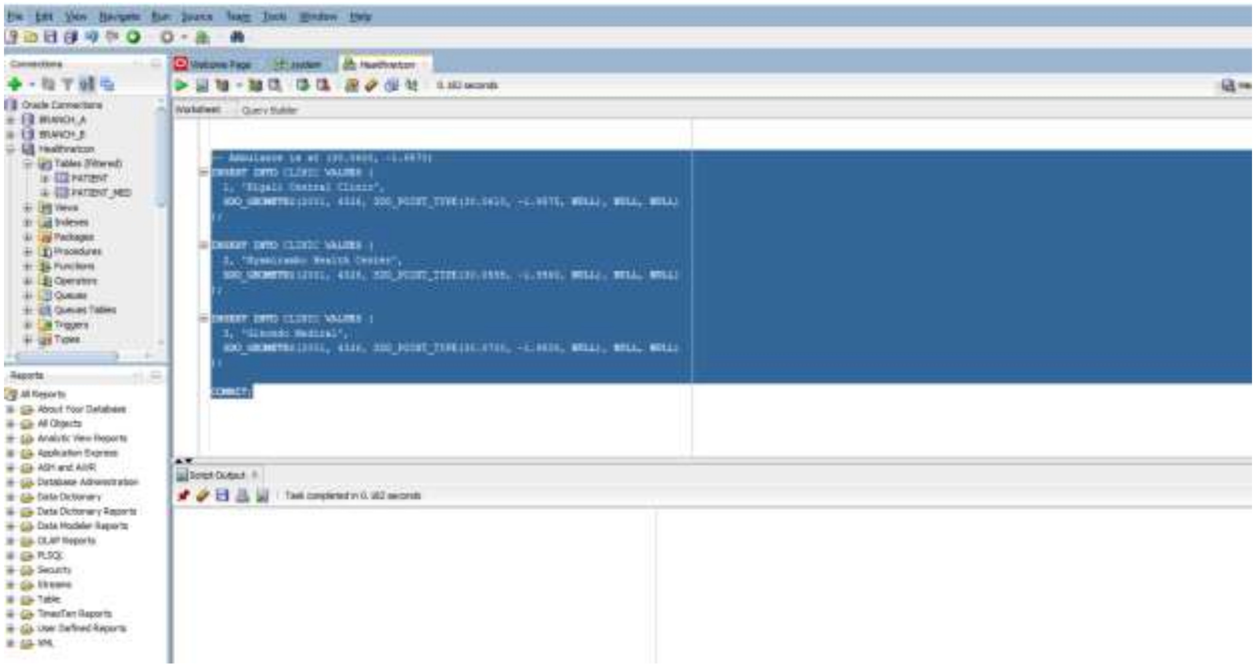
INSERT INTO CLINIC VALUES (

  3, 'Gikondo Medical',

  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0700, -1.9500, NULL), NULL, NULL)

);

COMMIT;



```
-- Ambulance is at (30.0600, -1.9570)
INSERT INTO CLINIC VALUES (
  1, 'Kigali Central Clinic',
  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0610, -1.9575, NULL), NULL, NULL)
);

INSERT INTO CLINIC VALUES (
  2, 'Nyamirambo Health Center',
  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE([illegible], [illegible], NULL), NULL, NULL)
);

INSERT INTO CLINIC VALUES (
  3, 'Gikondo Medical',
  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE([illegible], [illegible], NULL), NULL, NULL)
);

COMMIT;
```

Task completed in 0.162 seconds

SELECT C.ID, C.NAME

FROM CLINIC C

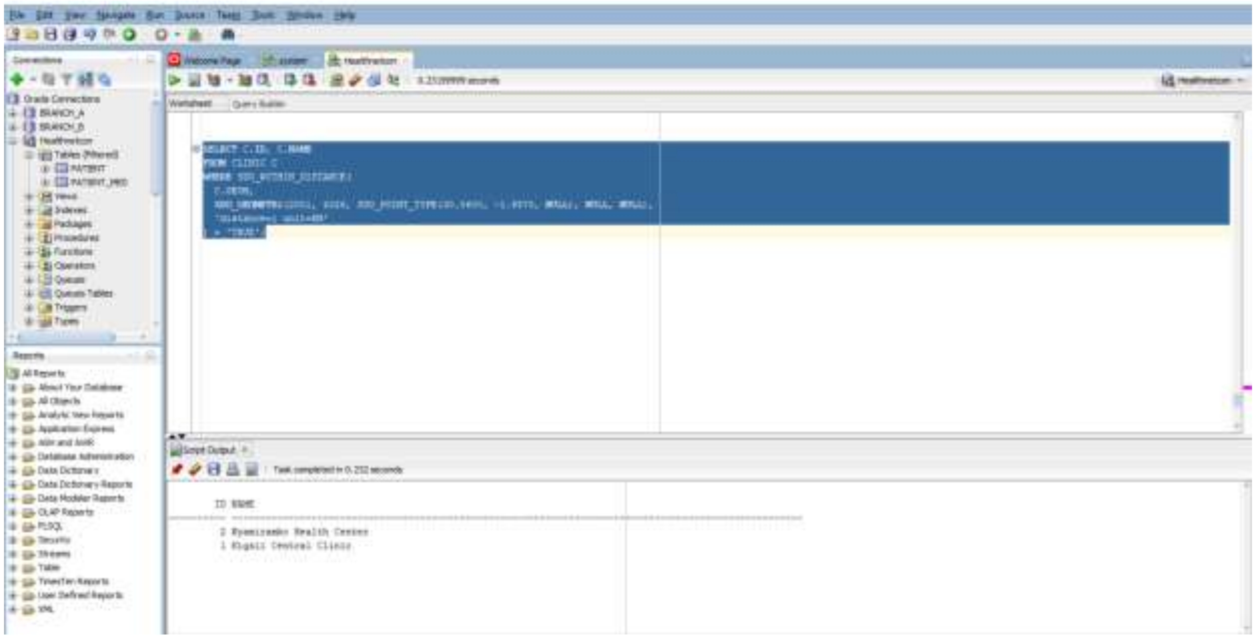
WHERE SDO_WITHIN_DISTANCE(

  C.GEOM,

  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0600, -1.9570, NULL), NULL, NULL),

  'distance=1 unit=KM'

) = 'TRUE';

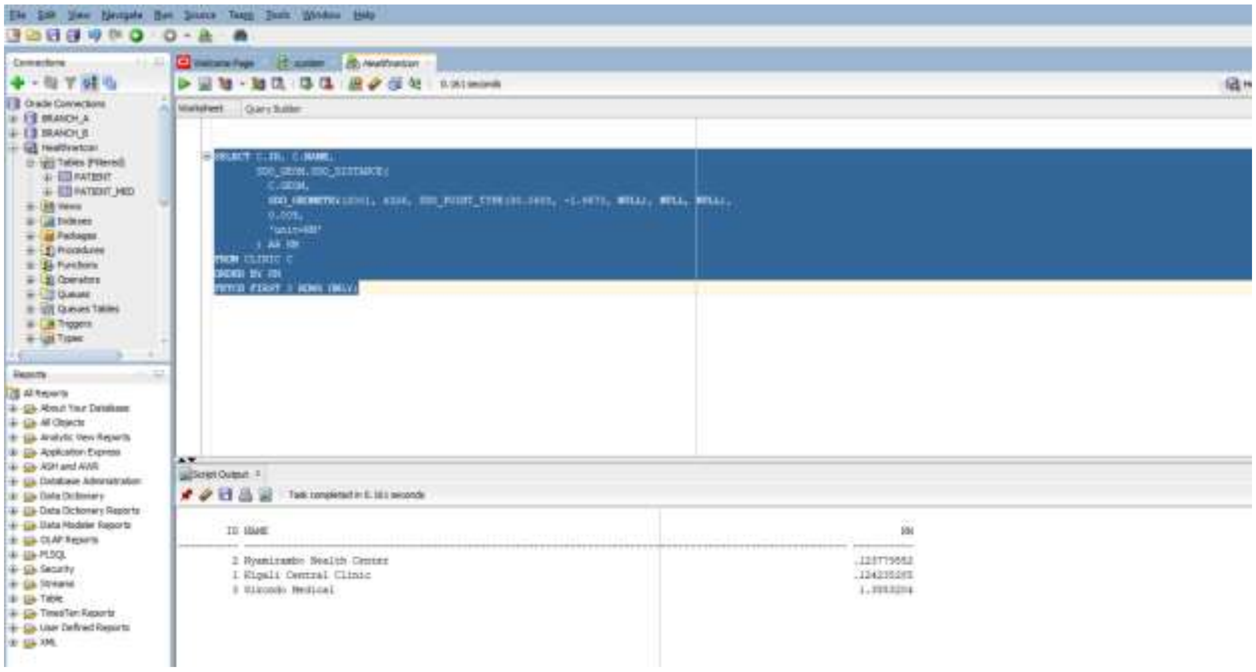


```
SELECT C.ID, C.NAME
FROM CLINIC C
WHERE SDO_WITHIN_DISTANCE(
  C.GEOM,
  SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0600, -1.9570, NULL), NULL, NULL),
  'distance=1 unit=KM'
) = 'TRUE';
```

Task completed in 0.232 seconds

```
        ID NAME
---------- ------------------------------------------------------------
         2 Nyamirambo Health Center
         1 Kigali Central Clinic
```

```
SELECT C.ID, C.NAME,
       SDO_GEOM.SDO_DISTANCE(
         C.GEOM,
         SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0600, -1.9570, NULL), NULL, NULL),
         0.005,
         'unit=KM'
       ) AS KM
FROM CLINIC C
ORDER BY KM
FETCH FIRST 3 ROWS ONLY;
```



```
SELECT C.ID, C.NAME,
       SDO_GEOM.SDO_DISTANCE(
         C.GEOM,
         SDO_GEOMETRY(2001, 4326, SDO_POINT_TYPE(30.0605, -1.9475, NULL), NULL, NULL),
         0.005,
         'unit=KM'
       ) AS KM
FROM CLINIC C
ORDER BY KM
FETCH FIRST 3 ROWS ONLY;
```

Task completed in 0.161 seconds

```
        ID NAME                                                                   KM
---------- ----------------------------------------------------------------- ----------
         2 Nyamirambo Health Center                                          .123775682
         1 Kigali Central Clinic                                             .124235265
         3 [illegible] Medical                                                1.3553204
```