PRACTICAL NO 6

Spatial Database

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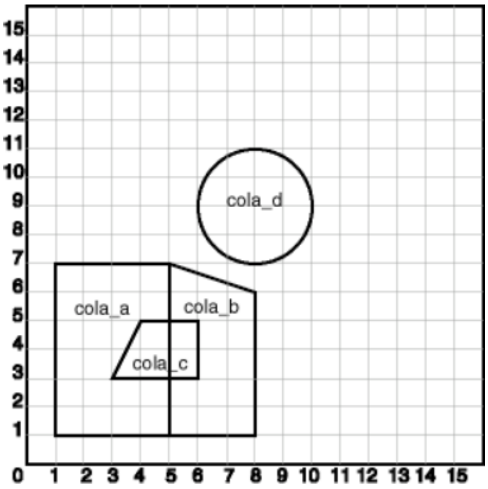
Practical 6:

Aim: Create a table that stores spatial data and issue queries on it.



Software Requirement: Oracle 11g

Query:

Create a spatial database table that stores the number, name and location, which consists of four different areas say abc, pqr, mno and xyz.

Fire the following queries:

a) Find the topological intersection of two geometries.

b) Find whether two geometric figures are equivalent to each other.

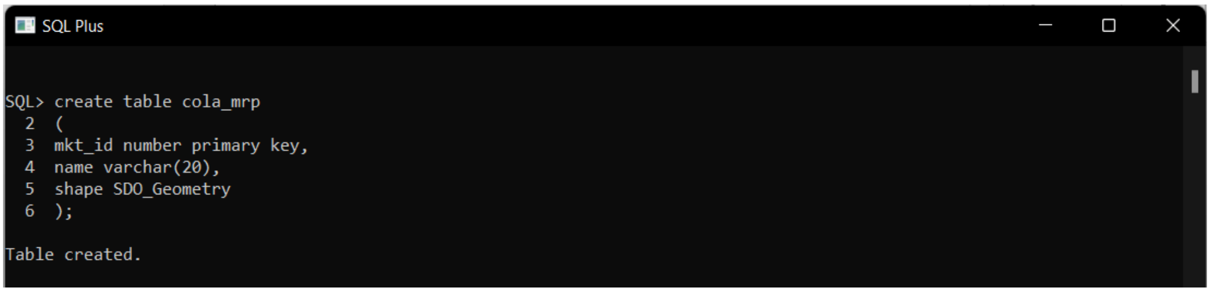
c) Find the areas of all different locations.

d) Find the area of only one location.

e) Find the distance between two geometries.

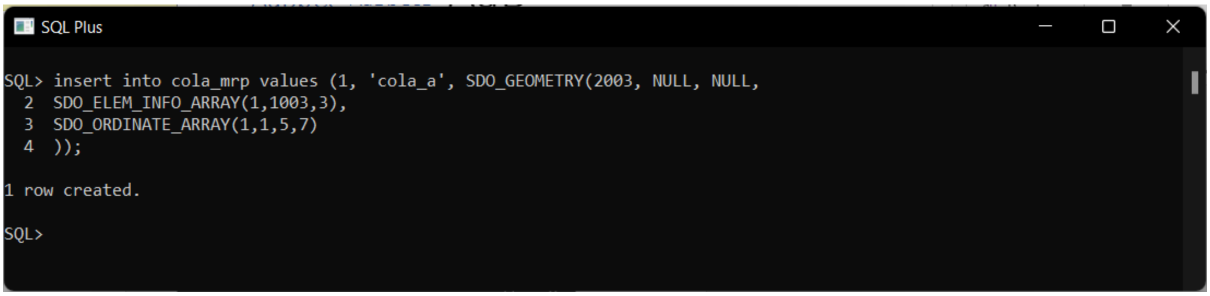
Practical Implementation:

1. **Create a table for cola (soft drink) markets in a given geography (such as city or state). Each row will be an area of interest for a specific cola (for example, where the cola is most preferred by residents, where the manufacturer believes the cola has growth potential, and so on). (For restrictions on spatial table and column names, see**

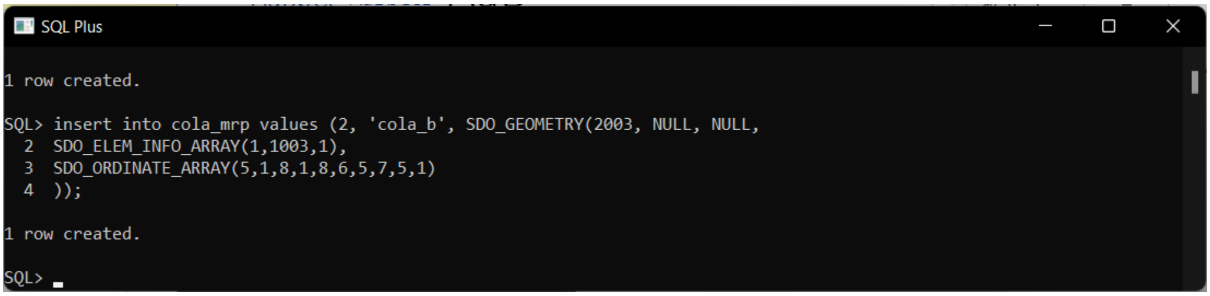


```
SQL> create table cola_mrp
  (
  mkt_id number primary key,
  name varchar(20),
  shape SDO_Geometry
  );

Table created.
```

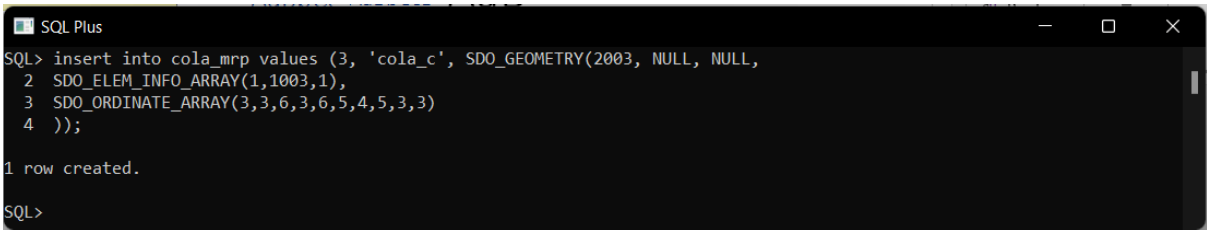
2. The next INSERT statement creates an area of interest for Cola A. This area happens to be a rectangle. The area could represent any user-defined criterion: for example, where Cola A is the preferred drink, where Cola A is under competitive pressure, where Cola A has strong growth potential, and so on.



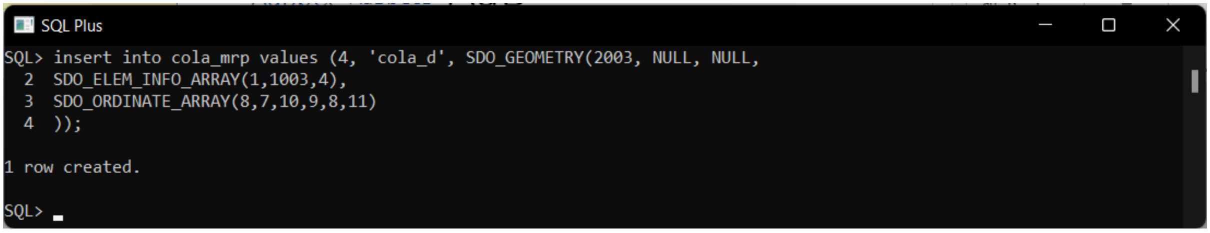
```
SQL> insert into cola_mrp values (1, 'cola_a', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,3),
  3  SDO_ORDINATE_ARRAY(1,1,5,7)
  4  ));

1 row created.

SQL>
```



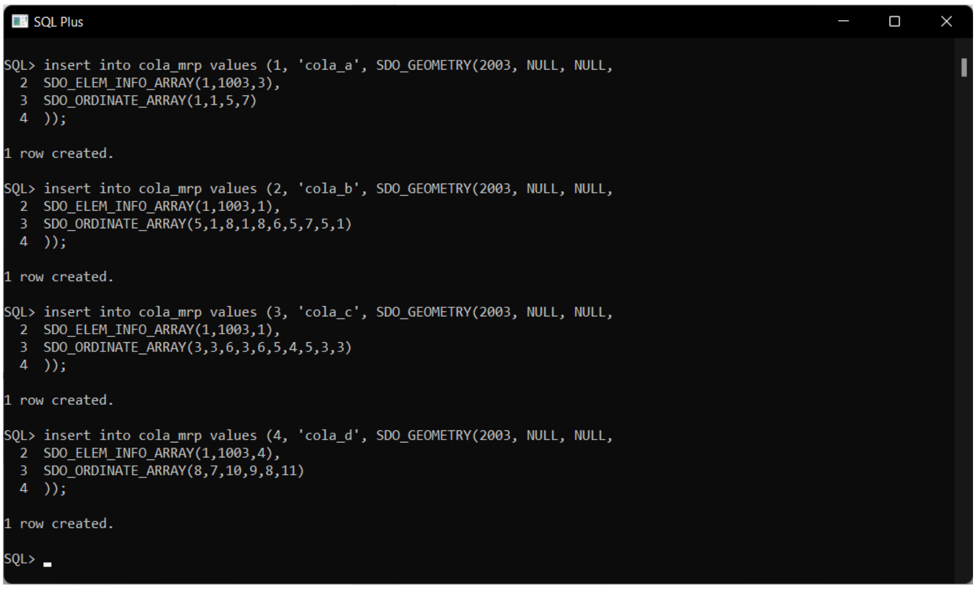
```
1 row created.

SQL> insert into cola_mrp values (2, 'cola_b', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,1),
  3  SDO_ORDINATE_ARRAY(5,1,8,1,8,6,5,7,5,1)
  4  ));

1 row created.

SQL> _
```



```
SQL> insert into cola_mrp values (3, 'cola_c', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,1),
  3  SDO_ORDINATE_ARRAY(3,3,6,3,6,5,4,5,3,3)
  4  ));

1 row created.

SQL>
```



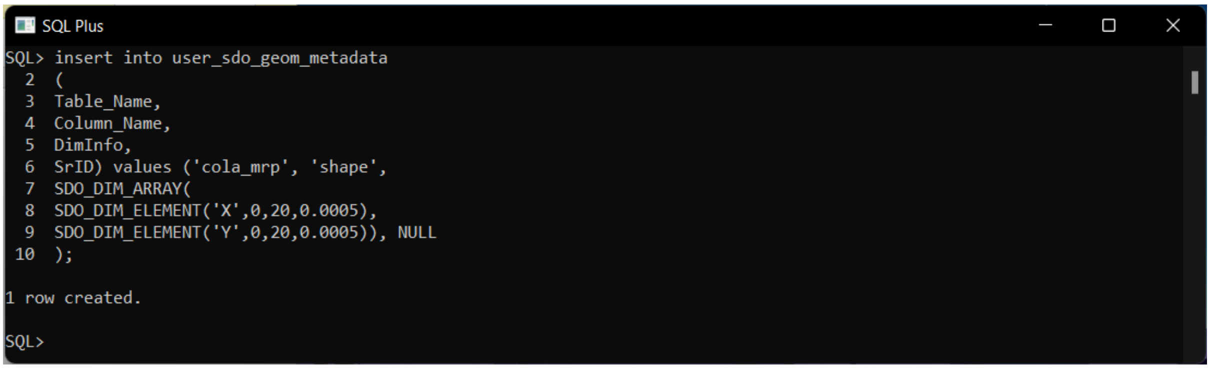
```
SQL> insert into cola_mrp values (4, 'cola_d', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,4),
  3  SDO_ORDINATE_ARRAY(8,7,10,9,8,11)
  4  ));

1 row created.

SQL> _
```



```
SQL> insert into cola_mrp values (1, 'cola_a', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,3),
  3  SDO_ORDINATE_ARRAY(1,1,5,7)
  4  ));

1 row created.

SQL> insert into cola_mrp values (2, 'cola_b', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,1),
  3  SDO_ORDINATE_ARRAY(5,1,8,1,8,6,5,7,5,1)
  4  ));

1 row created.

SQL> insert into cola_mrp values (3, 'cola_c', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,1),
  3  SDO_ORDINATE_ARRAY(3,3,6,3,6,5,4,5,3,3)
  4  ));

1 row created.

SQL> insert into cola_mrp values (4, 'cola_d', SDO_GEOMETRY(2003, NULL, NULL,
  2  SDO_ELEM_INFO_ARRAY(1,1003,4),
  3  SDO_ORDINATE_ARRAY(8,7,10,9,8,11)
  4  ));

1 row created.

SQL>
```

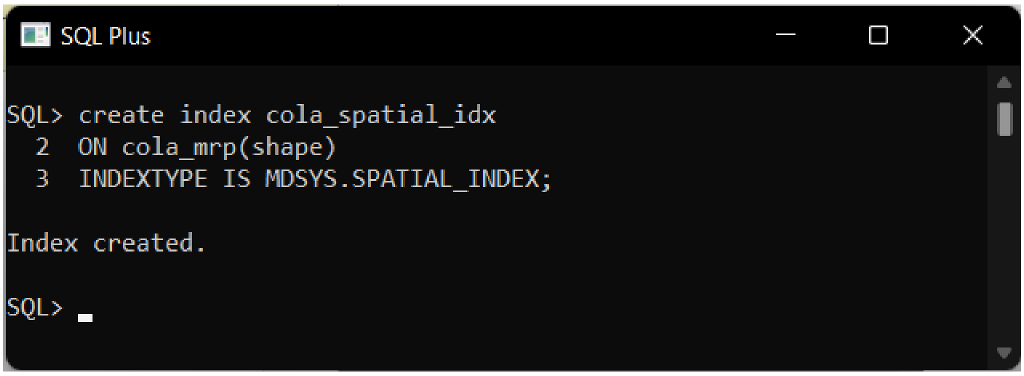
3. UPDATE METADATA VIEW

Update the USER_SDO_GEOM_METADATA view. This is required before the spatial index can be created. Do this only once for each layer (that is, table-column combination; here: COLA_MARKETS and SHAPE).



```
SQL> insert into user_sdo_geom_metadata
  2  (
  3  Table_Name,
  4  Column_Name,
  5  DimInfo,
  6  SrID) values ('cola_mrp', 'shape',
  7  SDO_DIM_ARRAY(
  8  SDO_DIM_ELEMENT('X',0,20,0.0005),
  9  SDO_DIM_ELEMENT('Y',0,20,0.0005)), NULL
 10  );

1 row created.

SQL>
```

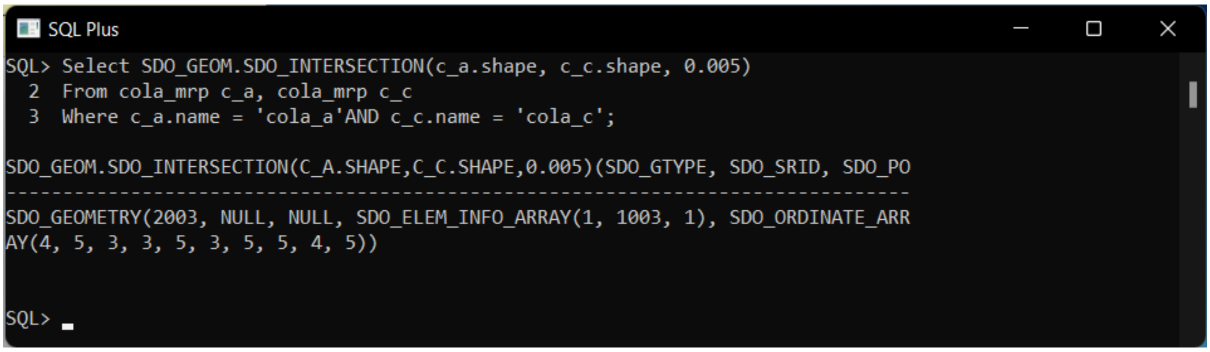
4. CREATE THE SPATIAL INDEX



```
SQL> create index cola_spatial_idx
  2  ON cola_mrp(shape)
  3  INDEXTYPE IS MDSYS.SPATIAL_INDEX;

Index created.

SQL>
```

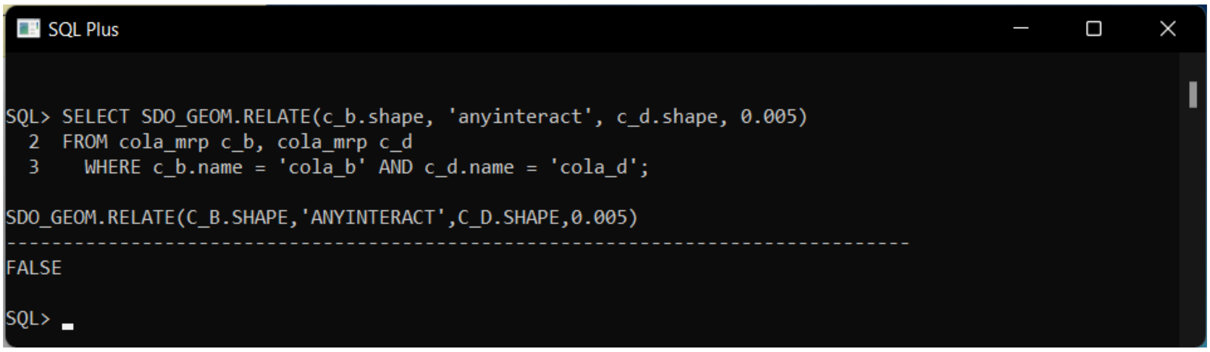
5. PERFORM SOME SPATIAL QUERIES

Return the topological intersection of two geometries



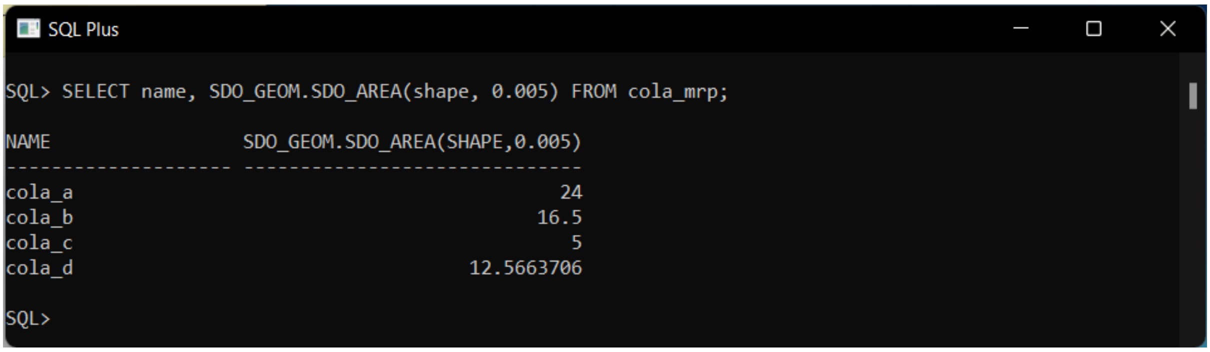
```
SQL> Select SDO_GEOM.SDO_INTERSECTION(c_a.shape, c_c.shape, 0.005)
  2  From cola_mrp c_a, cola_mrp c_c
  3  Where c_a.name = 'cola_a'AND c_c.name = 'cola_c';

SDO_GEOM.SDO_INTERSECTION(C_A.SHAPE,C_C.SHAPE,0.005)(SDO_GTYPE, SDO_SRID, SDO_PO
--------------------------------------------------------------------------------
SDO_GEOMETRY(2003, NULL, NULL, SDO_ELEM_INFO_ARRAY(1, 1003, 1), SDO_ORDINATE_ARR
AY(4, 5, 3, 3, 5, 3, 5, 5, 4, 5))


SQL>
```

Do two geometries have any spatial relationship?



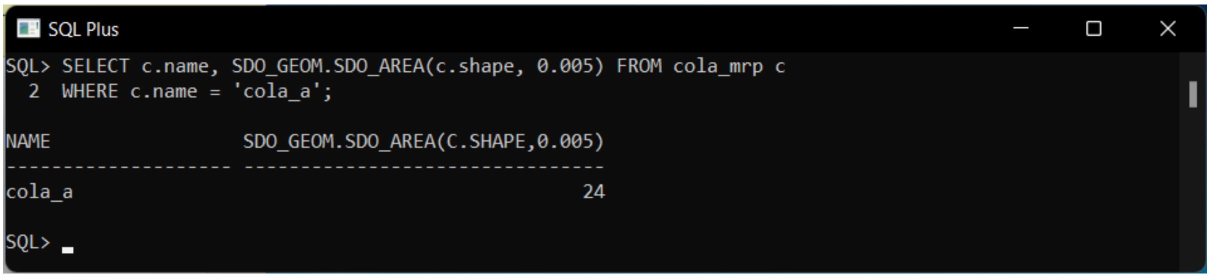
```
SQL> SELECT SDO_GEOM.RELATE(c_b.shape, 'anyinteract', c_d.shape, 0.005)
  2  FROM cola_mrp c_b, cola_mrp c_d
  3    WHERE c_b.name = 'cola_b' AND c_d.name = 'cola_d';

SDO_GEOM.RELATE(C_B.SHAPE,'ANYINTERACT',C_D.SHAPE,0.005)
--------------------------------------------------------------------------------
FALSE

SQL>
```

Return the areas of all cola markets



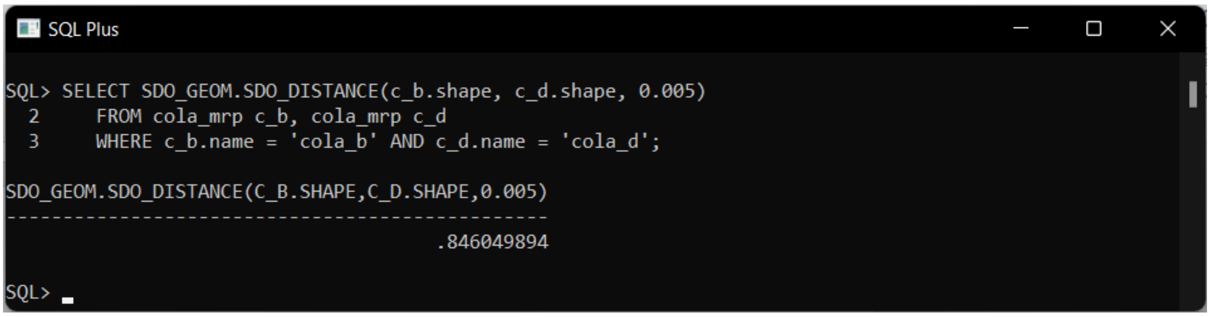
```
SQL> SELECT name, SDO_GEOM.SDO_AREA(shape, 0.005) FROM cola_mrp;

NAME                     SDO_GEOM.SDO_AREA(SHAPE,0.005)
------------------------------ ------------------------------
cola_a                                               24
cola_b                                             16.5
cola_c                                                5
cola_d                                       12.5663706

SQL>
```

Return the area of just cola_a



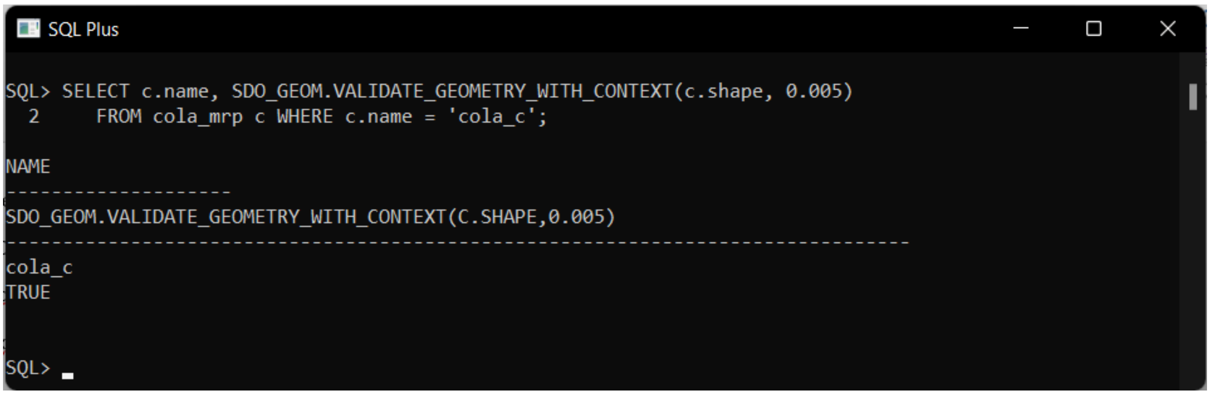
```
SQL> SELECT c.name, SDO_GEOM.SDO_AREA(c.shape, 0.005) FROM cola_mrp c
  2  WHERE c.name = 'cola_a';

NAME                     SDO_GEOM.SDO_AREA(C.SHAPE,0.005)
------------------------------ --------------------------------
cola_a                                                 24

SQL>
```

Return the distance between two geometries.



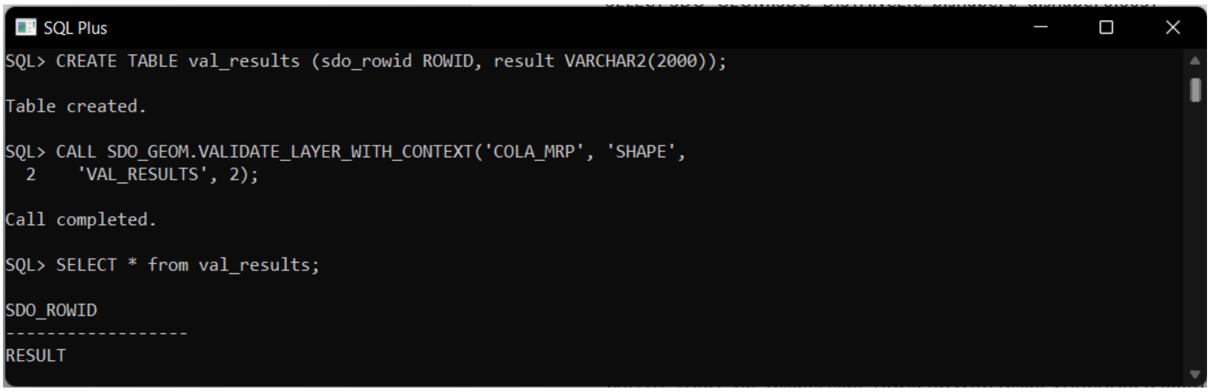
```
SQL> SELECT SDO_GEOM.SDO_DISTANCE(c_b.shape, c_d.shape, 0.005)
  2     FROM cola_mrp c_b, cola_mrp c_d
  3     WHERE c_b.name = 'cola_b' AND c_d.name = 'cola_d';

SDO_GEOM.SDO_DISTANCE(C_B.SHAPE,C_D.SHAPE,0.005)
------------------------------------------------
                                      .846049894

SQL>
```

Is a geometry valid?



```
SQL> SELECT c.name, SDO_GEOM.VALIDATE_GEOMETRY_WITH_CONTEXT(c.shape, 0.005)
  2     FROM cola_mrp c WHERE c.name = 'cola_c';

NAME
--------------------
SDO_GEOM.VALIDATE_GEOMETRY_WITH_CONTEXT(C.SHAPE,0.005)
--------------------------------------------------------------------------------
cola_c
TRUE


SQL>
```

is a layer valid? (First, create the results table)



```
SQL> CREATE TABLE val_results (sdo_rowid ROWID, result VARCHAR2(2000));

Table created.

SQL> CALL SDO_GEOM.VALIDATE_LAYER_WITH_CONTEXT('COLA_MRP', 'SHAPE',
  2    'VAL_RESULTS', 2);

Call completed.

SQL> SELECT * from val_results;

SDO_ROWID
------------------
RESULT
```

Conclusion : Successfully Performed the Spatial Data Queries on Oracle Database.