LABORATORIO SESION 03 INDICES, DCL Y CONTROL DE TRANSACCIONES

1. Creación de índices B-Tree

Hacer logon a la base de datos con el usuario hr

a. Copiar el script LABINDICES.sql al escritorio de la VM.

b. Ejecutar el script LABINDICES.sql. La ejecución del script puede tomar unos minutos.

```
SQL> @labindices.sql
drop sequence emp_test_emp_id_seq
              *
ERROR at line 1:
ORA-02289: sequence does not exist



Sequence created.

DROP table emp_test PURGE
           *
ERROR at line 1:
ORA-00942: table or view does not exist



Table created.


PL/SQL procedure successfully completed.

SQL>
```

c. Consultar las columnas EMPLOYEE_ID y LAST_NAME de la tabla EMP_TEST para el empleado de ID 5211

```
SQL> select employee_id,last_name from emp_test where employee_id = 5211;

EMPLOYEE_ID LAST_NAME
----------- ---------------------------------
       5211 Baida

Elapsed: 00:00:00.26
SQL>
```

d. Crear en índice B-Tree EMP_TEST_EMP_ID_IX sobre la table EMP_TEST columna EMPLOYEE_ID

```
SQL> create index emp_test_emp_id_ix on emp_test(employee_id);

Index created.

Elapsed: 00:00:01.51
SQL>
```

e. Consultar nuevamente las columnas EMPLOYEE_ID y LAST_NAME de la tabla EMP_TEST para el empleado de ID 5211

```
SQL> select employee_id,last_name from emp_test where employee_id = 5211;

EMPLOYEE_ID LAST_NAME
--------------- ---------------------------------
        5211 Baida

Elapsed: 00:00:00.09
SQL>
```

Se puede observar que el tiempo de la consulta ha disminuido de 26 milisegundos a 9 milisegundos.

NOTA: los tiempos mostrados pueden variar de un servidor a otro

2. Creación de índices BITMAP

a. Contar la cantidad de registros de la tabla EMP_TEST cuyo valor para la columna COUNTRY_NAME sea **United Kingdom**

```
SQL> select count(1) from emp_test where country_name = 'United Kingdom';

  COUNT(1)
----------
    330155

Elapsed: 00:00:00.12
SQL>
```

b. Crear en índice Bitmap EMP_TEST_COUNTRY_NAME_IX sobre la table EMP_TEST columna COUNTRY_NAME

```
SQL> create bitmap index emp_test_country_name_ix on emp_test(country_name);

Index created.

Elapsed: 00:00:00.35
SQL>
```

c. Contar nuevamente la cantidad de registros de la tabla EMP_TEST cuyo valor para la columna COUNTRY_NAME sea **United Kingdom**

```
SQL> select count(1) from emp_test where country_name = 'United Kingdom';

  COUNT(1)
----------
    330155

Elapsed: 00:00:00.04
SQL>
```

Se puede observar que el tiempo de la consulta ha disminuido de 12 milisegundos a 4 milisegundos.

NOTA: los tiempos mostrados pueden variar de un servidor a otro

d. Eliminar el índice creado.

```
SQL> drop index emp_test_country_name_ix;

Index dropped.
```

3. Diferencia entre indice B-Tree e indice Bitmap

a. Contar la cantidad de registros de la tabla EMP_TEST cuyo valor para la columna COUNTRY_NAME sea **Canada**

```
SQL> select count(1) from emp_test where country_name = 'Canada';

  COUNT(1)
----------
     18866

Elapsed: 00:00:00.14
```

b. Crear en índice ~~Bitmap~~ EMP_TEST_COUNTRY_NAME_BT sobre la table EMP_TEST columna COUNTRY_NAME

```
SQL> create index emp_test_country_name_bt on emp_test(country_name);

Index created.

Elapsed: 00:00:01.17
```

c. Contar nuevamente la cantidad de registros de la tabla EMP_TEST cuyo valor para la columna COUNTRY_NAME sea **Canada**

```
SQL> select count(1) from emp_test where country_name = 'Canada';

  COUNT(1)
----------
     18866

Elapsed: 00:00:00.10
```

Se puede observar que el tiempo de la consulta ha disminuido de 12 milisegundos a 4 milisegundos.

d. Eliminar el índice creado.

```
SQL> drop index emp_test_country_name_bt;

Index dropped.

Elapsed: 00:00:00.01
```

e. Crear en índice Bitmap EMP_TEST_COUNTRY_NAME_BI sobre la table EMP_TEST columna COUNTRY_NAME

```
SQL> create bitmap index emp_test_country_name_bi on emp_test(country_name);

Index created.

Elapsed: 00:00:00.23
```

f. Contar nuevamente la cantidad de registros de la tabla EMP_TEST cuyo valor para la columna COUNTRY_NAME sea **Canada**

```
SQL> select count(1) from emp_test where country_name = 'Canada';

  COUNT(1)
----------
     18866

Elapsed: 00:00:00.01
```

Se puede observar que el tiempo de la consulta ha disminuido de 12 milisegundos (sin índice), a 10 milisegundos (con índice B-Tree) y a 1 milisegundo (con índice Bitmap).

g. Eliminar el índice creado.

```
SQL> drop index emp_test_country_name_bi;

Index dropped.

Elapsed: 00:00:00.01
SQL>
```

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4. Consultando el diccionario de datos

a. Mostrar la estructura de la tabla PRODUCTS

```
SQL> desc PRODUCTS
 Name                          Null?    Type
 ----------------------------------------- -------- ----------------------------

 PROD_ID                                  NUMBER(6)
 PROD_NAME                                VARCHAR2(50)
 PROD_DESC                                VARCHAR2(4000)
 PROD_SUBCATEGORY                         VARCHAR2(50)
 PROD_SUBCATEGORY_ID                      NUMBER
 PROD_SUBCATEGORY_DESC                    VARCHAR2(2000)
 PROD_CATEGORY                            VARCHAR2(50)
 PROD_CATEGORY_ID                         NUMBER
 PROD_CATEGORY_DESC                       VARCHAR2(2000)
 PROD_WEIGHT_CLASS                        NUMBER(3)
 PROD_UNIT_OF_MEASURE                     VARCHAR2(20)
 PROD_PACK_SIZE                           VARCHAR2(30)
 SUPPLIER_ID                              NUMBER(6)
 PROD_STATUS                              VARCHAR2(20)
 PROD_LIST_PRICE                          NUMBER(8,2)
 PROD_MIN_PRICE                           NUMBER(8,2)
 PROD_TOTAL                               VARCHAR2(13)
 PROD_TOTAL_ID                            NUMBER
 PROD_SRC_ID                              NUMBER
 PROD_EFF_FROM                            DATE
 PROD_EFF_TO                              DATE
 PROD_VALID                               VARCHAR2(1)

SQL>
```

b. Consulta de las columnas de la tabla PRODUCTS en el diccionario de datos

```
SQL> col column_name format a25
SQL> col data_type format a30
SQL> select column_name,data_type,DATA_LENGTH
  2    from user tab columns
  3   where table name='PRODUCTS';

COLUMN_NAME               DATA_TYPE                      DATA_LENGTH
------------------------- ------------------------------ -----------
PROD_STATUS               VARCHAR2                            20
PROD_LIST_PRICE           NUMBER                              22
PROD_MIN_PRICE            NUMBER                              22
PROD_TOTAL                VARCHAR2                            13
PROD_TOTAL_ID             NUMBER                              22
PROD_SRC_ID               NUMBER                              22
PROD_EFF_FROM             DATE                                 7
PROD_EFF_TO               DATE                                 7
PROD_VALID                VARCHAR2                             1
PROD_ID                   NUMBER                              22
PROD_NAME                 VARCHAR2                            50
PROD_DESC                 VARCHAR2                          4000
PROD_SUBCATEGORY          VARCHAR2                            50
PROD_SUBCATEGORY_ID       NUMBER                              22
PROD_SUBCATEGORY_DESC     VARCHAR2                          2000
PROD_CATEGORY             VARCHAR2                            50
PROD_CATEGORY_ID          NUMBER                              22
PROD_CATEGORY_DESC        VARCHAR2                          2000
PROD_WEIGHT_CLASS         NUMBER                              22
PROD_UNIT_OF_MEASURE      VARCHAR2                            20
PROD_PACK_SIZE            VARCHAR2                            30
SUPPLIER_ID               NUMBER                              22

22 rows selected.
```

```
SQL>
```

c. Consultar los índices creados para la tabla PRODUCTS

```
SQL> col table_name format a20
SQL> col index_name format a30
SQL> select table_name,index_name,index_type
  2    from user_indexes
  3   where table_owner='LAB10'
  4     and table_name='EMP_TEST';

TABLE_NAME           INDEX_NAME                     INDEX_TYPE
-------------------- ------------------------------ ---------------------------
EMP_TEST             EMP_TEST_COUNTRY_NAME_IX       BITMAP

SQL>
```

d. Consultar los comentarios de las tablas

```
SQL> col table_name format a20
SQL> col comments format a59
SQL> select table_name,comments from user_tab_comments;

TABLE NAME           COMMENTS
-------------------- -----------------------------------------------------------

EMP_TEST
PRODUCTS             dimension table
PROMOTIONS           dimension table without a PK-FK relationship with the facts

                      table, to show outer join functionality
SQL>
```

e. Consultar los comentarios de las columnas

```
SQL> col table_name format a15
SQL> col column_name format a18
SQL> col comments format a42
SQL> select table_name,column_name,comments from user_col_comments;

TABLE NAME      COLUMN NAME        COMMENTS
--------------- ------------------ ----------------------------------------------
PROMOTIONS      PROMO_ID           primary key column
PROMOTIONS      PROMO_NAME         promotion description
PROMOTIONS      PROMO_SUBCATEGORY  enables to investigate promotion hierarchi
                                   es

PROMOTIONS      PROMO_SUBCATEGORY_
                ID

PROMOTIONS      PROMO_CATEGORY     promotion category
PROMOTIONS      PROMO_CATEGORY_ID
PROMOTIONS      PROMO_COST         promotion cost, to do promotion effect cal
                                   culations

PROMOTIONS      PROMO_BEGIN_DATE   promotion begin day
PROMOTIONS      PROMO_END_DATE     promotion end day
PROMOTIONS      PROMO_TOTAL
PROMOTIONS      PROMO_TOTAL_ID
PRODUCTS        PROD_ID            primary key
PRODUCTS        PROD_NAME          product name
PRODUCTS        PROD_DESC          product description
```

```
PRODUCTS         PROD_SUBCATEGORY   product subcategory
PRODUCTS         PROD_SUBCATEGORY_I
                 D

PRODUCTS         PROD_SUBCATEGORY_D product subcategory description
                 ESC

PRODUCTS         PROD_CATEGORY      product category
PRODUCTS         PROD_CATEGORY_ID
PRODUCTS         PROD_CATEGORY_DESC product category description
PRODUCTS         PROD_WEIGHT_CLASS product weight class
PRODUCTS         PROD_UNIT_OF_MEASU product unit of measure
                 RE

PRODUCTS         PROD_PACK_SIZE     product package size
PRODUCTS         SUPPLIER_ID
PRODUCTS         PROD_STATUS        product status
PRODUCTS         PROD_LIST_PRICE    product list price
PRODUCTS         PROD_MIN_PRICE     product minimum price
PRODUCTS         PROD_TOTAL
PRODUCTS         PROD_TOTAL_ID
PRODUCTS         PROD_SRC_ID
PRODUCTS         PROD_EFF_FROM
PRODUCTS         PROD_EFF_TO
PRODUCTS         PROD_VALID
EMP_TEST         EMPLOYEE_ID
EMP_TEST         JOB_ID
EMP_TEST         MANAGER_ID
EMP_TEST         MANAGER_ID2
EMP_TEST         DEPARTMENT_ID
EMP_TEST         LOCATION_ID
EMP_TEST         COUNTRY_ID
EMP_TEST         FIRST_NAME
EMP_TEST         LAST_NAME
EMP_TEST         SALARY
EMP_TEST         COMMISSION_PCT
EMP_TEST         DEPARTMENT_NAME
EMP_TEST         JOB_TITLE
EMP_TEST         CITY
EMP_TEST         STATE_PROVINCE
EMP_TEST         COUNTRY_NAME
EMP_TEST         REGION_NAME

50 rows selected.

SQL>
```