**********Experiment no:-02**********

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EXPERIMENT:-02

AIM:-

TO ESTABLISH A MULTI-RELATION DATABASE AND EXECUTE SQL QUERIES INVOLVING INSERTIONS,DELETIONS AND UPDATE ON IT.

Problem Statement:

Establish an environment for executing the queries based on the logical schemata and the database structuring for the SalesCo database given below...

CUSTOMER (C CODE, LNAME, FNAME, C AREA, C PHONE, BALANCE)
INVOICE (INV NUM. C CODE, INV DATE)
LINE (INV_NUM, L_NUM, P CODE, L UNITS,Ł_PRICE).
PRODUCT (P_CODE, DESCRIPT, P_DATE, QIY, P_MIN, P PRICE, P_DISCV_CODE)
VENDOR (V_CODE. V NAME, V CONTACT, V_AREA, V_PHONE, V STATE, V_ORDER)

==========Query-02==========

For each table of SalesCo database, list all the enforced constraints. (Use USER_CONSTRAINTS)

==========

```
SELECT CONSTRAINT_NAME,CONSTRAINT_TYPE,TABLE_NAME
   FROM USER_CONSTRAINTS
   WHERE TABLE_NAME='CUSTOMER' OR TABLE_NAME='INVOICE' OR
   TABLE_NAME='VENDOR' OR TABLE_NAME='PRODUCT'
   OR TABLE_NAME='LINE';
```

```
CONSTRAINT_NAME                C TABLE_NAME
------------------------------ - ------------------------------
VENDOR_CK_V_STATE              C VENDOR
VENDOR_CK_V_AREA               C VENDOR
VENDOR_CK_V_CODE               C VENDOR
SYS_C007278                    C VENDOR
SYS_C007277                    C VENDOR
SYS_C007276                    C VENDOR
SYS_C007275                    C VENDOR
SYS_C007274                    C VENDOR
SYS_C007273                    C VENDOR
SYS_C007272                    C VENDOR
PRODUCT_CK_P_MIN               C PRODUCT
SYS_C007289                    C PRODUCT
SYS_C007288                    C PRODUCT
SYS_C007287                    C PRODUCT
SYS_C007286                    C PRODUCT
SYS_C007285                    C PRODUCT
SYS_C007284                    C PRODUCT
SYS_C007283                    C PRODUCT
LINE_CK_L_PRICE                C LINE
LINE_CK_L_UNITS                C LINE
LINE_CK_L_NUM                  C LINE
SYS_C007297                    C LINE
SYS_C007296                    C LINE
SYS_C007295                    C LINE
SYS_C007294                    C LINE
SYS_C007293                    C LINE
INVOICE_CK_INV_NUM             C INVOICE
SYS_C007268                    C INVOICE
SYS_C007267                    C INVOICE
SYS_C007266                    C INVOICE
CUSTOMER_CK_C_AREA             C CUSTOMER
CUSTOMER_CK_C_CODE             C CUSTOMER
SYS_C007262                    C CUSTOMER
SYS_C007261                    C CUSTOMER
SYS_C007260                    C CUSTOMER
SYS_C007259                    C CUSTOMER
SYS_C007258                    C CUSTOMER
SYS_C007257                    C CUSTOMER
PRODUCT_VENDOR_FK_V_CODE       R PRODUCT
LINE_PRODUCT_FK_P_CODE         R LINE
LINE_INVOICE_FK_INV_NUM        R LINE
INVOICE_CUSTOMER_FK_C_CODE     R INVOICE
VENDOR_PK_V_CODE               P VENDOR
PRODUCT_PK_P_CODE              P PRODUCT
LINE_PK_INV_NUM_L_NUM          P LINE
INVOICE_PK_INV_NUM             P INVOICE
CUSTOMER_PK_C_CODE             P CUSTOMER

47 rows selected.
```

==========Query03==========

Write SQL code to insert a LINE record - 1009, 1, HW15X, 20, 15.50. What are the problems encountered? Assume that the 60 units of the product “HiVeld Hammer" were supplied by "Indian Masters” located in “KY' at unit price of 15.50 on January 10, 2020. Minimum stock quantity was anticipated to be 15. The line was billed to “You" located in area 904 with phone 3562098 and a balance of 500.00 on June 22, 2020. The supplier with ID 24992 has a contact named “Your Sibling" with phone 2863322.Write appropriate SELECT statements to showcase the effects of the query.

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PROBLEM

```
INSERT INTO LINE VALUES(1009,1,'HW15X',20,15.50);
INSERT INTO LINE VALUES(1009,1,'HW15X',20,15.50)
*
ERROR at line 1:
ORA-02291: integrity constraint (CSB46.LINE_PRODUCT_FK_P_CODE)
violated - parent key not found
```

REASON:

We tried to reference a table using a primary key, but the columns that we listed did not match the primary key, or a primary key does not exist for this table.

```
SELECT  C.FNAME,C.LNAME,I.* ,P.P_CODE,P.DESCRIPT,V.V_NAME,V_CONTACT FROM
CUSTOMER C INNER JOIN INVOICE I ON C.C_CODE=I.C_CODE
   INNER JOIN   LINE L ON L.INV_NUM=I.INV_NUM
   INNER JOIN PRODUCT P  ON P.P_CODE=L.P_CODE
   INNER JOIN VENDOR V ON V.V_CODE=P.V_CODE
   WHERE C.C_CODE=10020;
```

```
FNAME   LNAME    INV_NUM C_CODE INV_DATE  P_CO  D DESCRIPT    V_NAME       V_CONTACT
-------  -------  ------ ------ --------- -----  --------    ----------  --------
Saurabh Khandagale 1009  10020 22-JUN-20 HW15X HiVeld Hammer INDIAN MASTER ABHI KHANDAGALE
```

==========Query04==========
Write SQL code that will list P_CODE, DESCRIPT, V_CODE for all products
that are some kind of hammers or screws.

==========

```
SQL> SELECT P_CODE,DESCRIPT,V_CODE
     FROM PRODUCT
     WHERE DESCRIPT LIKE'%Hammer'OR DESCRIPT LIKE'%Screw';
```

P_COD	DESCRIPT	V_CODE
CH10X	Claw Hammer	21225
SH100	Sledge Hammer	
MC001	Metal Screw	21225
WC025	2.5in wide Screw	21231
HW15X	HiVeld Hammer	24992

==========Query05==========

Write SQl CODE THAT WILL LIST ALL PRODUCT WHICH WERE ADDES TO INVENTORY DURING 2020

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```
SELECT * FROM PRODUCT WHERE P_DATE LIKE'%20';
```

P_COD	DESCRIPT	P_DATE	QTY	P_MIN	P_PRICE	P_DISC	V_CODE
CL025	Hrd. Spring 1/4in	15-JAN-20	15	8	39.95	0	23119
CL050	Hrd. Spring 1/2in	15-JAN-20	23	5	43.99	0	23119
CD00X	Cordless Drill	20-JAN-20	12	5	38.95	.05	25595
CH10X	Claw Hammer	20-JAN-20	23	10	9.95	.1	21225
SH100	Sledge Hammer	02-JAN-20	8	5	14.4	.05	
HC100	Hicut Chain Saw	07-FEB-20	11	5	256.99	.05	24288
PP101	PVC Pipe	20-FEB-20	188	75	5.87	0	
MC001	Metal Screw	01-MAR-20	172	75	6.99	0	21225
WC025	2.5in wide Screw	24-FEB-20	237	100	8.45	0	21231
SM48X	Steel Malting Mesh	17-JAN-20	18	5	119.95	.1	25595

==========Query07==========

Write SQL code that will list all invoices billed to customers Elena Johnson. Your query must account for combining the FNAME and LNAME attributes while creating and testing the predicate

==========

```
SELECT C.FNAME,C.LNAME,I.* FROM CUSTOMER C
INNER JOIN INVOICE I
ON C.C_CODE=I.C_CODE WHERE LNAME='Johnson' AND FNAME='Elena';
```

FNAME	LNAME	INV_NUM	C_CODE	INV_DATE
Elena	Johnson	1002	10011	16-JAN-20
Elena	Johnson	1005	10011	17-JAN-20
Elena	Johnson	1008	10011	17-JAN-20

==========Query08==========

Write SQL code that will remove the vendor 23119. Explain the problem(s) encountered (if any). Now, if the policy decision has been to allow such removals from vendor list by removing the depending relation tuples; modify the constraints in PRODUCT table. On modifying the constraints, remove the said vendor and check the changes in database. Revert to the database state as before executing this query.

==========

```
ERROR at line 1:
ORA-02292: integrity constraint (CSB46.PRODUCT_VENDOR_FK_V_CODE) violated -
child record found
```

Explain:-We are trying to delete the record directly from the parent table which will lead to **inconsistency**.So to prevent the database from inconsistency Oracle does not allow database user to delete the data directly from parent table. But there are some cases in which database users have to delete the data from parent table directly so for such cases oracle gives us **ON DELETE CASCADE** option.

```
ALTER TABLE PRODUCT DROP CONSTRAINT PRODUCT_VENDOR_FK_V_CODE;

Table altered.

ALTER TABLE PRODUCT ADD CONSTRAINT ON_DELETE FOREIGN KEY(V_CODE) REFERENCES
VENDOR(V_CODE) ON DELETE CASCADE;

Table altered.
```

```
SELECT CONSTRAINT_NAME,CONSTRAINT_TYPE, DELETE_RULE FROM USER_CONSTRAINTS
WHERE TABLE_NAME='PRODUCT';


CONSTRAINT_NAME                C DELETE_RULE
------------------------------ - ---------
SYS_C007283                    C
SYS_C007284                    C
SYS_C007285                    C
SYS_C007286                    C
SYS_C007287                    C
SYS_C007288                    C
SYS_C007289                    C
PRODUCT_CK_P_MIN               C
PRODUCT_PK_P_CODE              P
ON_DELETE                      R CASCADE
```

```
====================================Query09================================
Write SQL code that lists all products that were supplied by vendors belonging
to the state ‘KY' arranged in increasing sequence of vendor code. The output
should include vendor code, vendor's name, product code, product description,
vendor contact, and inventory purchase date.

===========================================================================
```

```
SELECT V.V_CODE,V.V_NAME,P.P_CODE,P.DESCRIPT,V.V_CONTACT,P.P_DATE
     FROM VENDOR V INNER JOIN PRODUCT P  ON P.V_CODE=V.V_CODE
     WHERE V.V_STATE='KY'
     ORDER BY V.V_CODE  DESC;


V_CODE  V_NAME         P_COD DESCRIPT           V_CONTACT            P_DATE
--- -------------- ----------------------   --------------       ---------
24992 INDIAN MASTER    HW15X HiVeld Hammer     ABHI KHANDAGALE      10-JAN-20
24992 INDIAN MASTER    AB111 Power Drill       ABHI KHANDAGALE      14-AUG-20
24992 INDIAN MASTER    PP102 PVC PIPE          ABHI KHANDAGALE      15-AUG-20
21344 Gomez Sons       SB725 7.25in Saw Blade  Mark Welder          13-DEC-19
21344 Gomez Sons       SB900 9.00 in Saw Blade Mark Welder          13-NOV-19
21344 Gomez Sons       RF100 Rat Tail File     Mark Welder          15-DEC-19
```

```
====================================Query10================================
Write SQL code that will list details of customers who purchased the products
CDOOX or PP101. The output must include customer name (combination of FName &
LName), product code and date of purchase.
===========================================================================


SELECT C.FNAME,C.LNAME,P.P_CODE,P.P_DATE  FROM
    CUSTOMER C INNER JOIN INVOICE I ON C.C_CODE=I.C_CODE
    INNER JOIN  LINE L ON I.INV_NUM=L.INV_NUM
    INNER JOIN PRODUCT P  ON L.P_CODE=P.P_CODE
    WHERE P.P_CODE LIKE'CD00X' OR P.P_CODE LIKE'PP101';



FNAME      LNAME      P_COD P_DATE
---------- ---------- ----- ---------
Elena      Johnson    PP101 20-FEB-20
Elena      Johnson    PP101 20-FEB-20
Kathy      Smith      CD00X 20-JAN-20
Kathy      Smith      CD00X 20-JAN-20
```

**********QUES12**********

Write SQL code that will modify Query-11, to include the subtotals for each of the line with invoice numbers. [You are required compute a derived column SUBTOTAL as L_UNITS * L_PRICE].

****

```
SELECT C.C_CODE,I.INV_NUM,L.L_UNITS,L.L_PRICE ,(L.L_UNITS*L.L_PRICE)
AS SUBTOTAL
    FROM CUSTOMER C INNER JOIN INVOICE I
    ON C.C_CODE=I.C_CODE INNER JOIN LINE L
    ON I.INV_NUM=L.INV_NUM
    ORDER BY I.INV_NUM DESC;
```

C_CODE	INV_NUM	L_UNITS	L_PRICE	SUBTOTAL
10020	1009	20	15.5	310
10011	1008	1	9.95	9.95
10011	1008	3	119.95	359.85
10011	1008	5	5.87	29.35
10015	1007	1	4.99	4.99
10015	1007	2	14.99	29.98
10014	1006	3	6.99	20.97
10014	1006	1	256.99	256.99
10014	1006	1	9.95	9.95
10014	1006	1	109.92	109.92
10011	1005	12	5.87	70.44
10018	1004	2	9.95	19.9
10018	1004	3	4.99	14.97
10012	1003	1	39.95	39.95
10012	1003	1	38.95	38.95
10012	1003	5	14.99	74.95
10011	1002	2	4.99	9.98
10014	1001	1	9.95	9.95
10014	1001	1	14.99	14.99

Viva Voice
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**********Question-1**********
1.Bring out differences among super key, candidate key and primary key constraint?
Ans:-

Super Keys : Super key stands for superset of a key. A Super Key is a set of one or more attributes that are taken collectively and can identify all other attributes uniquely.

For Example, We are having table

Book (BookId, BookName, Author)
So in this table we can have

1. (BookId)
2. (BookId,BookName)
3. (BookId, BookName, Author)
4. (BookId, Author)
5. (BookName, Author)

As our Super key. Each super key is able to uniquely identify each tuple (record).

Candidate Keys Candidate keys are a super key which are not having any redundant attributes. In other words candidate keys are minimal super keys. For Example, In above illustration

1. (BookId)
2. (BookName,Author)

These two keys can be candidate keys, as remaining keys are having redundant attributes. Means in super key (BookId, BookName) record can be uniquely identify by just bookid and therefore Bookname is redundant attribute

Primary Key: It is a candidate key that is chosen by the database designer to identify entities with in an entity set. OR A key which is used to uniquely identify each record is known as primary key.

From above Candidate keys any one can be the primary key. And the another one which is not chosen as primary key will be know as Alternate key.

**********Question-2**********
2. Differentiate between primary key constraint and unique constraint.

Primary Key:

- There can only be one primary key in a table
- In some DBMS it cannot be NULL - e.g. MySQL adds NOT NULL
- Primary Key is a unique key identifier of the record

Unique Key:

- Can be more than one unique key in one table
- Unique key can have NULL values
- It can be a candidate key
- Unique key can be NULL ; multiple rows can have NULL values and therefore may not be considered "unique"

**********Question-3**********

3. How DROP TABLE differs from TRUNCATE?

DROP

1. it removes a tablefrom a database.
2. It removes: the definition, the partitions, the data and the triggers of the table.
3. It maintains: the privileges that have been specifically granted to the table.
4. Roll-back capability: no, as it causes an implicit commit.
5. Speed: it’s quite fast.

TRUNCATE:

1. it empties a table completely, without returning the number of removed rows.
2. It removes: all data from the table.
3. It maintains: the definition, the partitions and the triggers of the table.
4. Roll-back capability: no, as it causes an implicit commit.
5. Speed: it’s quite fast, as it actually drops the full table and re-creates an empty one.

**********Question-4**********

4. How does DEFAULT differ from CHECK

CHECK

The CHECK SQL constraint controls the values that you can insert into the column on which the constraint is defined. The constraint definition contains one or more logical (Boolean) expressions that evaluate to be True or False. The value inserted into the column is verified against those expressions. If the expression returns True, the value is inserted; otherwise, it violates the constraint.

DEFAULT

At times, you might want to automatically insert a value into a column when no other value is provided. That's where the DEFAULT SQL constraint comes in. You can use the constraint to define a column's default value. This can be a handy way to add the current date and time to a column or to avoid having to use NULL values.

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Inference:-

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1. To Delete data directly from parent table we need to add ON DELETE CASCADE .
2. Fetching data from different tables requires join operations.
3. While Inserting data in child table make sure that the parent table should also have same referencing value or else it will lead to an error(integrity constraint violation);