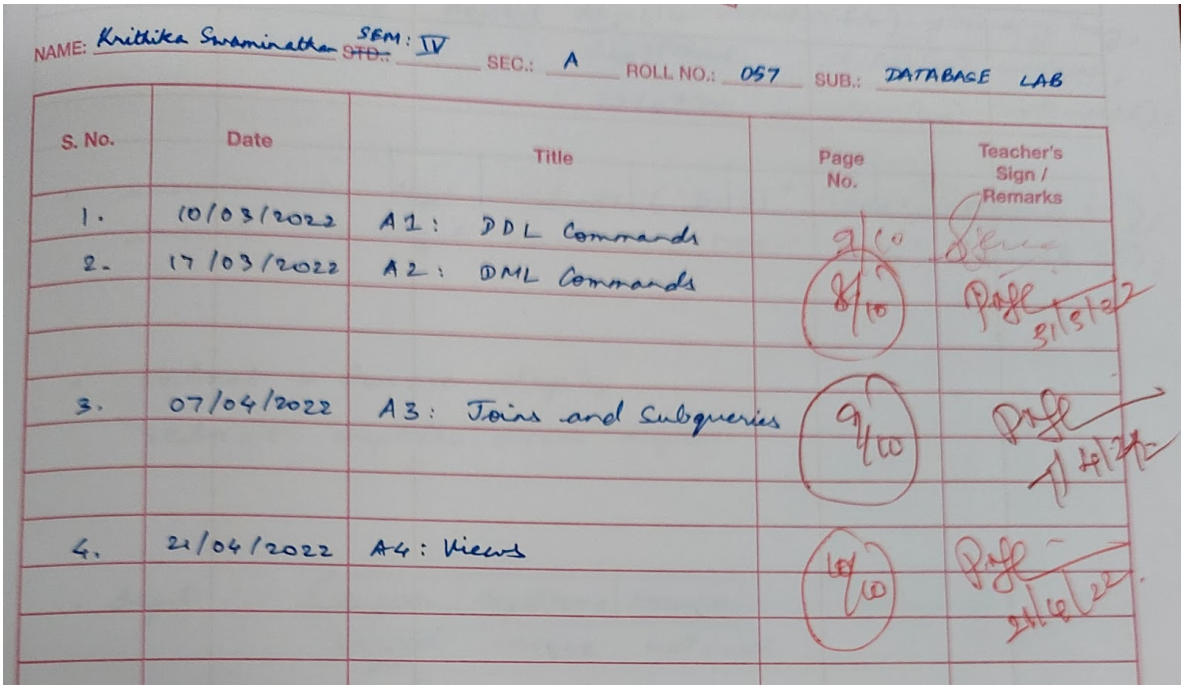
Assignment 4 – Views

Validation:



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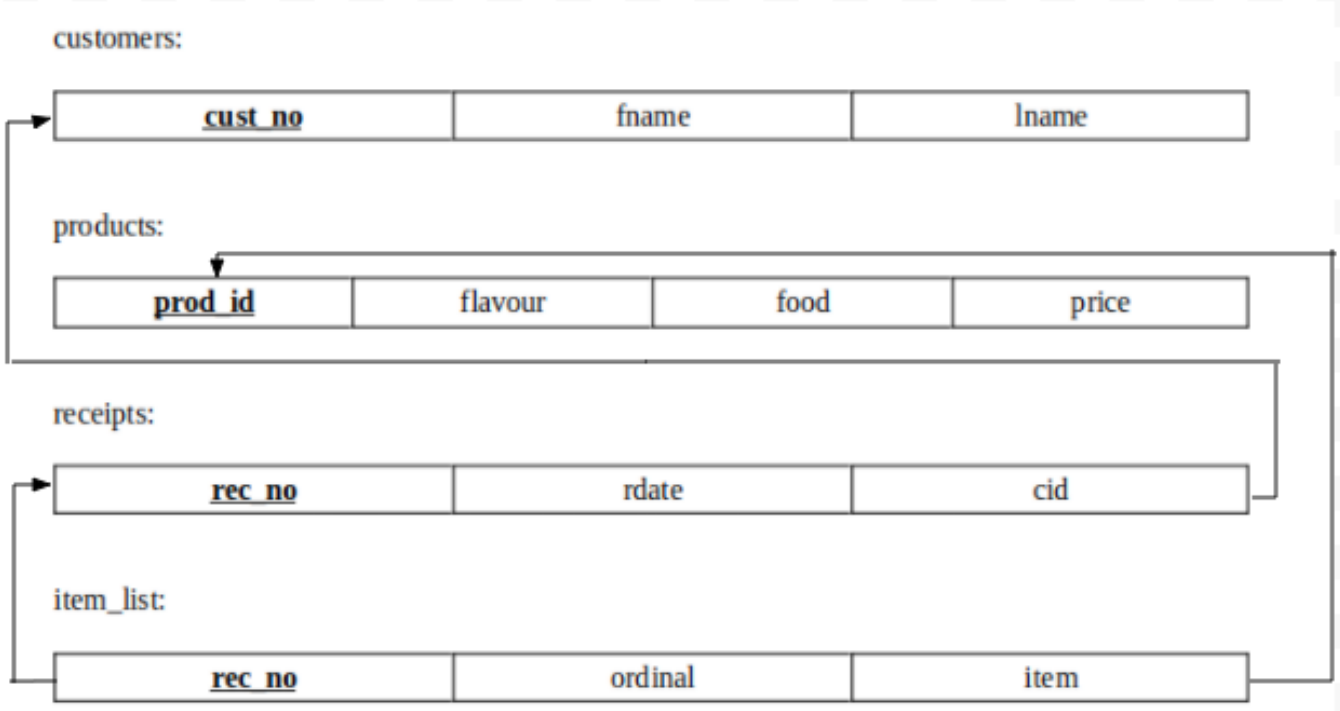
S. No.	Date	Title	Page No.	Teacher's Sign / Remarks
1.	10/03/2022	A1: DDL Commands	9/10	
2.	17/03/2022	A2: DML Commands	8/10	Prof 31/3/22
3.	07/04/2022	A3: Joins and Subqueries	9/10	Prof 7/4/22
4.	21/04/2022	A4: Views	10/10	Prof 21/4/22

Schema diagram:



Inferences:

View 1: Blue_Flavor

Operation	*Operation on View*	*Reflection in Base Table*
INSERT	Yes	Yes
UPDATE	prod_id, food, price	prod_id, food, price
DELETE	Yes	Yes

Remark: Since *flavour* is absent from the view and is also the selection criterion for creating the view, insertions cannot be seen in the view.
The view is updatable.

View 2: Cheap_Food

Operation	*Operation on View*	*Reflection in Base Table*
INSERT	Yes	Yes
UPDATE	prod_id, flavour, price	prod_id, flavour, price
DELETE	Yes	Yes

Remark: The price is checked with condition price < 1 before any record is inserted into the view. The view is updated for valid inputs.
The view is updatable.

View 3: Hot_Food

Operation	*Operation on View*	*Reflection in Base Table*
INSERT	No	No
UPDATE	NIL	NIL
DELETE	No	No

Remark:

A virtual column does not allow insertion.
The presence of aggregate functions indicate that a view cannot be updated.
Data manipulation is illegal for virtual columns.

The view is not updatable.

View 4: Pie_Food

Operation	*Operation on View*	*Reflection in Base Table*
INSERT	No	No
UPDATE	rec_no, ordinal	rec_no, ordinal
DELETE	Yes	No

Remark:

Only two attributes – *rec_no* and *ordinal* – are from *item_list*, which is a key-preserved table.
All the other attributes are from non-key-preserved tables and hence, they are not updatable.

The view is not updatable.

View 5: Cheap_View

Operation	*Operation on View*	*Reflection in Table*
INSERT	No	No
UPDATE	prod_id, flavour, food	prod_id, flavour, food
DELETE	Yes	Yes

Remark: Since the check option is present in the view Cheap_Food (from which Cheap_View has been derived), insertion is not allowed.
The view is not updatable.

Data file:

```
SQL> @C:/Krithika/DBL/a4data.sql;
SQL> REM Population of Bakery Database

SQL> drop table item_list;
Table dropped.

SQL> drop table receipts;
Table dropped.

SQL> drop table products;
Table dropped.

SQL> drop table customers;
Table dropped.

SQL>
SQL> create table customers(
  2         cust_no number(2) constraint c_pk primary key,
  3         lname varchar2(20),
  4         fname varchar2(20)
  5         );

Table created.

SQL>
SQL> insert into customers values(1, 'LOGAN', 'JULIET');
1 row created.
.
.
.
SQL> insert into customers values(21, 'JOHN', 'DAVID');
1 row created.

SQL> create table products(
  2         prod_id varchar2(20) constraint prod_pk primary key,
  3         flavour varchar2(20),
  4         food varchar2(20),
```

```
  5         price number
  6         );

Table created.

SQL>
SQL> insert into products values('20-BC-C-10','Chocolate','Cake',8.95);
1 row created.
.
.
.
SQL> insert into products values('51-BLU','Blueberry','Danish',1.15);
1 row created.

SQL> create table receipts(
  2         rec_no number(5) constraint rec_pk primary key,
  3         rdate date,
  4         cid number(2) constraint rec_fk references customers(cust_no)
  5         );

Table created.

SQL>
SQL> INSERT INTO Receipts values(18129, '28-Oct-2007', 15);
1 row created.
.
.
.
SQL> INSERT INTO Receipts values(34378, '23-Oct-2007', 6);
1 row created.

SQL> create table item_list(
  2         rec_no number(5) constraint it_fk1 references receipts(rec_no),
  3         ordinal number(2),
  4         item varchar2(20) constraint it_fk2 references products(prod_id),
  5         constraint item_pk primary key(rec_no,ordinal)
  6         );

Table created.

SQL>
SQL> insert into item_list values(18129, 1,  '70-TU');
1 row created.
.
.
.
SQL> insert into item_list values(34378, 2,  '45-VA');
1 row created.

SQL>
```

```
SQL> REM *** End of database population ***

SQL>
SQL> REM ********************* END OF DATA FILE ************************
```

Script file:

```
SQL> @z:/a4views.sql;
SQL> REM Assignment 4
SQL>
SQL> REM --------------------------------------------------------------------------
> REM *** ASSIGNMENT QUESTIONS ***
SQL> REM --------------------------------------------------------------------------
> REM Consider the schema used in Assignment 3.
SQL>
SQL>
SQL> REM **_____Create view(s) based on table(s) or view(s) and observe their behaviour while
performing update operations on them_____**
SQL>


SQL> REM 1. Create a view named Blue_Flavor, which displays the product details (product id,
food, price) of Blueberry flavour.
SQL>
SQL> REM Creating view:
SQL> create or replace view Blue_Flavor as
  2  select prod_id, food, price from products
  3  where flavour='Blueberry';

View created.

SQL>
SQL> REM Displaying view:
SQL> select * from Blue_Flavor;

PROD_ID            FOOD                 PRICE
------------------- -------------------- ----------
90-BLU-11          Tart                   3.25
51-BLU             Danish                 1.15

SQL>
SQL> REM Savepoint:
SQL> savepoint question1;

Savepoint created.

SQL>
SQL> REM Checking if updatable:
SQL> select COLUMN_NAME, UPDATABLE, INSERTABLE, DELETABLE
```

```
  2  from USER_UPDATABLE_COLUMNS
  3  where TABLE_NAME='BLUE_FLAVOR';

COLUMN_NAME                    UPD INS DEL
------------------------------ --- --- ---
PROD_ID                        YES YES YES
FOOD                           YES YES YES
PRICE                          YES YES YES

SQL>
SQL> REM Insertion:
SQL> insert into Blue_Flavor values ('61-GC','Cake',9.20);

1 row created.

SQL>
SQL> REM Insertion verification:
SQL> select * from Blue_Flavor;

PROD_ID            FOOD                    PRICE
------------------ ------------------- ----------
90-BLU-11          Tart                    3.25
51-BLU             Danish                  1.15

SQL> REM Flavour is not specified as Blueberry and hence, the row is not present in the view.
SQL>
SQL> select * from products where prod_id='61-GC';

PROD_ID            FLAVOUR            FOOD                    PRICE
------------------ ------------------ ------------------- ----------
61-GC                                 Cake                    9.2

SQL> REM In the table 'products', the values are inserted leaving 'flavour' empty.
SQL>
SQL> REM Updation:
SQL> update Blue_Flavor set prod_id='61-BLU' where prod_id='61-GC';

0 rows updated.

SQL> REM The row with prod_id='61-BLU' is not in the view and hence, it cannot be updated.
SQL>
SQL> update Blue_Flavor set food='Cake' where prod_id='51-BLU';

1 row updated.

SQL> update Blue_Flavor set price=3.75 where prod_id='90-BLU-11';

1 row updated.

SQL>
```

```
SQL> REM Updation verification:
SQL> select * from Blue_Flavor where prod_id='61-BLU';

no rows selected

SQL> select * from products where prod_id='61-BLU';

no rows selected

SQL>
SQL> select * from Blue_Flavor where prod_id='51-BLU';

PROD_ID            FOOD                 PRICE
------------------ -------------------- ----------
51-BLU             Cake                   1.15

SQL> select * from products where prod_id='51-BLU';

PROD_ID            FLAVOUR              FOOD                 PRICE
------------------ -------------------- -------------------- ----------
51-BLU             Blueberry            Cake                   1.15

SQL>
SQL> select * from Blue_Flavor where prod_id='90-BLU-11';

PROD_ID            FOOD                 PRICE
------------------ -------------------- ----------
90-BLU-11          Tart                   3.75

SQL> select * from products where prod_id='51-BLU';

PROD_ID            FLAVOUR              FOOD                 PRICE
------------------ -------------------- -------------------- ----------
51-BLU             Blueberry            Cake                   1.15

SQL>
SQL> REM Deletion:
SQL> delete from Blue_Flavor where prod_id='61-BLU';

0 rows deleted.

SQL>
SQL> REM Deletion verification:
SQL> select * from Blue_Flavor;

PROD_ID            FOOD                 PRICE
------------------ -------------------- ----------
90-BLU-11          Tart                   3.75
51-BLU             Cake                   1.15
```

```
SQL> select * from products where prod_id='61-BLU';

no rows selected

SQL>
SQL> REM Insertion in table:
SQL> insert into products values('88-SS-10','Blueberry','Cone', 2.95);

1 row created.

SQL>
SQL> REM Insertion verification:
SQL> select * from Blue_Flavor;

PROD_ID            FOOD                 PRICE
------------------- -------------------- ----------
90-BLU-11          Tart                 3.75
51-BLU             Cake                 1.15
88-SS-10           Cone                 2.95

SQL> select * from products where prod_id='88-SS-10';

PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- -------------------- -------------------- ----------
88-SS-10           Blueberry          Cone                 2.95

SQL>
SQL> REM Updation in table:
SQL> update products set prod_id='61-BLU' where prod_id='88-SS-10';

1 row updated.

SQL> update products set food='Cake' where prod_id='61-BLU';

1 row updated.

SQL> update products set price=4.25 where prod_id='61-BLU';

1 row updated.

SQL>
SQL> REM Updation verification:
SQL> select * from Blue_Flavor where prod_id='61-BLU';

PROD_ID            FOOD                 PRICE
------------------- -------------------- ----------
61-BLU             Cake                 4.25

SQL> select * from products where prod_id='61-BLU';
```

```
PROD_ID            FLAVOUR            FOOD                 PRICE
-------------------- -------------------- -------------------- ----------
61-BLU             Blueberry          Cake                   4.25

SQL>
SQL> REM Deletion in table:
SQL> delete from Blue_Flavor where prod_id='61-BLU';

1 row deleted.

SQL>
SQL> REM Deletion verification:
SQL> select * from Blue_Flavor;

PROD_ID            FOOD                 PRICE
-------------------- -------------------- ----------
90-BLU-11          Tart                   3.75
51-BLU             Cake                   1.15

SQL> select * from products where prod_id='61-BLU';

no rows selected

SQL>
SQL> rollback to question1;

Rollback complete.

SQL>
SQL> REM *INFERENCE:*
SQL> REM Insertion: Insertion into the view is reflected in the parent table but not in the view as
flavour is the selection criterion but not an attribute of the view. Insertion into the parent table is
reflected in both.
SQL> REM Updation: Key preserved. All the attributes in the view are updatable and updation in
the main table is reflected in both.
SQL> REM Deletion: Deletions in both the view and the parent table are reflected in both.
SQL>


SQL>
SQL> REM 2. Create a view named Cheap_Food, which displays the details (product id, flavour,
food, price) of products with price lesser than $1. Ensure that, the price of these food(s) should
never rise above $1 through view.
SQL>
SQL> REM Creating view:
SQL> create or replace view Cheap_Food as
  2  select prod_id, flavour, food, price from products
  3  where price < 1
  4  with check option;
```

```
View created.

SQL>
SQL> REM Displaying view:
SQL> select * from Cheap_Food;

PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- ------------------- ------------------- ----------
70-LEM              Lemon              Cookie                .79
70-W                Walnut             Cookie               .79

SQL>
SQL> REM Savepoint:
SQL> savepoint question2;

Savepoint created.

SQL>
SQL> REM Checking if updatable:
SQL> select COLUMN_NAME, UPDATABLE, INSERTABLE, DELETABLE
  2  from USER_UPDATABLE_COLUMNS
  3  where TABLE_NAME='CHEAP_FOOD';

COLUMN_NAME                    UPD INS DEL
------------------------------ --- --- ---
PROD_ID                        YES YES YES
FLAVOUR                        YES YES YES
FOOD                           YES YES YES
PRICE                          YES YES YES

SQL>
SQL> REM Insertion:
SQL> REM invalid
SQL> insert into Cheap_Food values ('89-NE','Blackberry','Tart',7.50);
insert into Cheap_Food values ('89-NE','Blackberry','Tart',7.50)
            *
ERROR at line 1:
ORA-01402: view WITH CHECK OPTION where-clause violation


SQL> REM valid
SQL> insert into Cheap_Food values ('89-NE','Blackberry','Tart',0.50);

1 row created.

SQL>
SQL> REM Insertion verification:
SQL> select * from Cheap_Food;

PROD_ID            FLAVOUR            FOOD                 PRICE
```

```
-------------------- -------------------- -------------------- ----------
70-LEM               Lemon                Cookie                    .79
70-W                 Walnut               Cookie                   .79
89-NE                Blackberry           Tart                      .5

SQL> select * from products where prod_id='89-NE';

PROD_ID              FLAVOUR              FOOD                   PRICE
-------------------- -------------------- -------------------- ----------
89-NE                Blackberry           Tart                      .5

SQL>
SQL> REM Updation:
SQL> update Cheap_Food set prod_id='90-NEW' where prod_id='89-NE';

1 row updated.

SQL> update Cheap_Food set flavour='Tomato' where prod_id='90-NEW';

1 row updated.

SQL> update Cheap_Food set food='Chips' where prod_id='90-NEW';

1 row updated.

SQL> update Cheap_Food set price=0.75 where prod_id='90-NEW';

1 row updated.

SQL>
SQL> REM Updation verification:
SQL> select * from Cheap_Food where prod_id='90-NEW';

PROD_ID              FLAVOUR              FOOD                   PRICE
-------------------- -------------------- -------------------- ----------
90-NEW               Tomato               Chips                    .75

SQL> select * from products where prod_id='90-NEW';

PROD_ID              FLAVOUR              FOOD                   PRICE
-------------------- -------------------- -------------------- ----------
90-NEW               Tomato               Chips                    .75

SQL>
SQL> REM Deletion:
SQL> delete from Cheap_Food where prod_id='90-NEW';

1 row deleted.

SQL>
```

```
SQL> REM Deletion verification:
SQL> select * from Cheap_Food;

PROD_ID            FLAVOUR            FOOD                PRICE
------------------ ------------------ ------------------- ----------
70-LEM             Lemon              Cookie                .79
70-W               Walnut             Cookie               .79

SQL> select * from products where prod_id='90-NEW';

no rows selected

SQL>
SQL> REM Insertion in table:
SQL> insert into products values('88-SS-10','Blueberry','Cone', 0.75);

1 row created.

SQL>
SQL> REM Insertion verification:
SQL> select * from Cheap_Food;

PROD_ID            FLAVOUR            FOOD                PRICE
------------------ ------------------ ------------------- ----------
70-LEM             Lemon              Cookie                .79
70-W               Walnut             Cookie               .79
88-SS-10           Blueberry          Cone                  .75

SQL> select * from products where prod_id='88-SS-10';

PROD_ID            FLAVOUR            FOOD                PRICE
------------------ ------------------ ------------------- ----------
88-SS-10           Blueberry          Cone                  .75

SQL>
SQL> REM Updation in table:
SQL> update products set prod_id='90-NEW-2' where prod_id='88-SS-10';

1 row updated.

SQL> update products set flavour='Tomato' where prod_id='90-NEW-2';

1 row updated.

SQL> update products set food='Chips' where prod_id='90-NEW-2';

1 row updated.

SQL> update products set price=0.75 where prod_id='90-NEW-2';
```

1 row updated.

SQL>
SQL> REM Updation verification:
SQL> select * from Cheap_Food where prod_id='90-NEW-2';

PROD_ID	FLAVOUR	FOOD	PRICE
90-NEW-2	Tomato	Chips	.75

SQL> select * from products where prod_id='90-NEW-2';

PROD_ID	FLAVOUR	FOOD	PRICE
90-NEW-2	Tomato	Chips	.75

SQL>
SQL> REM Deletion in table:
SQL> delete from products where prod_id='90-NEW-2';

1 row deleted.

SQL>
SQL> REM Deletion verification:
SQL> select * from Cheap_Food;

PROD_ID	FLAVOUR	FOOD	PRICE
70-LEM	Lemon	Cookie	.79
70-W	Walnut	Cookie	.79

SQL> select * from products where prod_id='90-NEW-2';
no rows selected

SQL>
SQL> rollback to question2;

Rollback complete.

SQL>
SQL> REM *INFERENCE:*
SQL> REM Insertion: Insertions into both the view and the parent table are reflected in both. Products with price > 1 are not allowed due to the 'with check' option in the view.
SQL> REM Updation: Key preserved. All the attributes in the view are updatable and updations in the main table are reflected in both.
SQL> REM Deletion: Deletions in both the view and the parent table are reflected in both.
SQL>

SQL>

```
SQL> REM 3. Create a view called Hot_Food that show the product id and its quantity where the
same product is ordered more than once in the same receipt.
SQL>
SQL> REM Creating view:
SQL> create or replace view Hot_Food as
  2  select item, count(*) as quantity from item_list
  3  group by rec_no, item having count(*)>1;

View created.

SQL>
SQL> REM Displaying view:
SQL> select * from Hot_Food;

ITEM                 QUANTITY
-------------------- ----------
70-R                          2
90-APR-PF                     2
50-APP                        2
51-ATW                        2
90-ALM-I                      2
90-BER-11                     2
90-PEC-11                     2
70-M-CH-DZ                    2
46-11                         2
70-M-CH-DZ                    2
90-CHR-11                     2

ITEM                 QUANTITY
-------------------- ----------
90-BLU-11                     2
50-CHS                        2
70-M-CH-DZ                    2
70-R                          2
90-APP-11                     2
70-MAR                        2
50-APR                        2
51-BC                         2
50-ALM                        2

20 rows selected.

SQL>
SQL> REM Savepoint:
SQL> savepoint question3;

Savepoint created.

SQL>
SQL> REM Checking if updatable:
```

```
SQL> select COLUMN_NAME, UPDATABLE, INSERTABLE, DELETABLE
  2  from USER_UPDATABLE_COLUMNS
  3  where TABLE_NAME='HOT_FOOD';

COLUMN_NAME                    UPD INS DEL
------------------------------ --- --- ---
ITEM                           NO  NO  NO
QUANTITY                       NO  NO  NO

SQL>
SQL> REM Insertion:
SQL> insert into Hot_Food values ('999-ZA',2);
insert into Hot_Food values ('999-ZA',2)
*
ERROR at line 1:
ORA-01733: virtual column not allowed here


SQL>
SQL> REM Insertion verification:
SQL> select * from Hot_Food;

ITEM                 QUANTITY
-------------------- ----------
70-R                          2
90-APR-PF                     2
50-APP                        2
51-ATW                        2
90-ALM-I                      2
90-BER-11                     2
90-PEC-11                     2
70-M-CH-DZ                    2
46-11                         2
70-M-CH-DZ                    2
90-CHR-11                     2

ITEM                 QUANTITY
-------------------- ----------
90-BLU-11                     2
50-CHS                        2
70-M-CH-DZ                    2
70-R                          2
90-APP-11                     2
70-MAR                        2
50-APR                        2
51-BC                         2
50-ALM                        2

20 rows selected.
```

```
SQL> select * from item_list where item='999-ZA';

no rows selected

SQL>
SQL> REM Updation:
SQL> update Hot_Food set item='99-NEW' where item='999-ZA';
update Hot_Food set item='99-NEW' where item='999-ZA'
       *
ERROR at line 1:
ORA-01732: data manipulation operation not legal on this view


SQL> update Hot_Food set quantity=4 where item='99-NEW';
update Hot_Food set quantity=4 where item='99-NEW'
       *
ERROR at line 1:
ORA-01732: data manipulation operation not legal on this view


SQL>
SQL> REM Updation verification:
SQL> select * from Hot_Food where item='99-NEW';

no rows selected

SQL> select * from item_list where item='99-NEW';

no rows selected

SQL>
SQL> REM Deletion:
SQL> delete from Hot_Food where item='99-NEW';
delete from Hot_Food where item='99-NEW'
            *
ERROR at line 1:
ORA-01732: data manipulation operation not legal on this view


SQL>
SQL> REM Deletion verification:
SQL> select * from Hot_Food;

ITEM                 QUANTITY
-------------------- ----------
70-R                          2
90-APR-PF                     2
50-APP                        2
51-ATW                        2
90-ALM-I                      2
```

```
90-BER-11                 2
90-PEC-11                 2
70-M-CH-DZ                2
46-11                     2
70-M-CH-DZ                2
90-CHR-11                 2

ITEM                QUANTITY
------------------- ----------
90-BLU-11                 2
50-CHS                    2
70-M-CH-DZ                2
70-R                      2
90-APP-11                 2
70-MAR                    2
50-APR                    2
51-BC                     2
50-ALM                    2

20 rows selected.

SQL> select * from item_list where item='99-NEW';

no rows selected

SQL>
SQL> REM Insertion in table:
SQL> insert into item_list values(11923,20,'70-MAR');

1 row created.

SQL>
SQL> REM Insertion verification:
SQL> select * from Hot_Food;

ITEM                QUANTITY
------------------- ----------
70-R                      2
90-APR-PF                 2
50-APP                    2
51-ATW                    2
90-ALM-I                  2
90-BER-11                 2
90-PEC-11                 2
70-M-CH-DZ                2
46-11                     2
70-M-CH-DZ                2
90-CHR-11                 2

ITEM                QUANTITY
```

```
-------------------- ----------
90-BLU-11                     2
50-CHS                        2
70-M-CH-DZ                    2
70-R                          2
90-APP-11                     2
70-MAR                        2
50-APR                        2
51-BC                         2
50-ALM                        2

20 rows selected.

SQL> select * from item_list where item='70-MAR';

   REC_NO    ORDINAL ITEM
---------- ---------- --------------------
    59716          2 70-MAR
    66227          3 70-MAR
    38157          1 70-MAR
    31874          1 70-MAR
    31874          2 70-MAR
    72207          1 70-MAR
    77032          4 70-MAR
    15286          1 70-MAR
    17685          4 70-MAR
    70162          4 70-MAR
    74741          3 70-MAR

   REC_NO    ORDINAL ITEM
---------- ---------- --------------------
    61948          1 70-MAR
    95514          3 70-MAR
    97097          1 70-MAR
    16532          2 70-MAR
    11923         20 70-MAR

16 rows selected.

SQL>
SQL> REM Deletion in table:
SQL> delete from Hot_Food where item='70-MAR';
delete from Hot_Food where item='70-MAR'
            *
ERROR at line 1:
ORA-01732: data manipulation operation not legal on this view


SQL>
SQL> REM Deletion verification:
```

SQL> select * from Hot_Food;

ITEM	QUANTITY
70-R	2
90-APR-PF	2
50-APP	2
51-ATW	2
90-ALM-I	2
90-BER-11	2
90-PEC-11	2
70-M-CH-DZ	2
46-11	2
70-M-CH-DZ	2
90-CHR-11	2

ITEM	QUANTITY
90-BLU-11	2
50-CHS	2
70-M-CH-DZ	2
70-R	2
90-APP-11	2
70-MAR	2
50-APR	2
51-BC	2
50-ALM	2

20 rows selected.

SQL> select * from item_list where item='70-MAR';

REC_NO	ORDINAL	ITEM
59716	2	70-MAR
66227	3	70-MAR
38157	1	70-MAR
31874	1	70-MAR
31874	2	70-MAR
72207	1	70-MAR
77032	4	70-MAR
15286	1	70-MAR
17685	4	70-MAR
70162	4	70-MAR
74741	3	70-MAR

REC_NO	ORDINAL	ITEM
61948	1	70-MAR
95514	3	70-MAR

```
    97097         1 70-MAR
    16532         2 70-MAR
    11923        20 70-MAR

16 rows selected.

SQL>
SQL> rollback to question3;

Rollback complete.

SQL>
SQL> REM *INFERENCE:*
SQL> REM Insertion: Insertion in view is not allowed due to the presence of a virtual column
(group by column). Insertion in the parent table is reflected in both.
SQL> REM Updation: None of the attributes in the view are updatable due to the virtual column.
Updation in the parent table is reflected in both.
SQL> REM Deletion: Deletion in view is not allowed as data manipulation is not allowed with
virtual columns. Deletion in the parent table is reflected in both.
SQL>


SQL>
SQL> REM 4. Create a view named Pie_Food that will display the details (customer lname, flavor,
receipt number and date, ordinal) who had ordered the Pie food with receipt details.
SQL>
SQL> REM Creating view:
SQL> create or replace view Pie_Food as
  2  select lname, flavour, rec_no, rdate, ordinal
  3  from customers
  4  join receipts on (cust_no = cid)
  5  join item_list using (rec_no)
  6  join products on (item = prod_id)
  7  where food='Pie';

View created.

SQL>
SQL> REM Displaying view:
SQL> select * from Pie_Food;

LNAME              FLAVOUR              REC_NO RDATE       ORDINAL
-------------------- -------------------- ---------- --------- ----------
LOGAN              Apple                39685 28-OCT-07         4
LOGAN              Apple                66227 10-OCT-07         2
ESPOSITA           Apple                48647 09-OCT-07         2
SLINGLAND          Apple                87454 21-OCT-07         1
SLINGLAND          Apple                47353 12-OCT-07         2
HELING             Apple                53376 30-OCT-07         3
HAFFERKAMP         Apple                50660 18-OCT-07         2
```

```
ARNN            Apple               11548 21-OCT-07         2
SOPKO           Apple               29226 26-OCT-07         2
SOPKO           Apple               51991 17-OCT-07         1
CRUZEN          Apple               39109 02-OCT-07         1

LNAME           FLAVOUR             REC_NO RDATE       ORDINAL
--------------- ------------------- ---------- --------- ----------
CRUZEN          Apple               44798 04-OCT-07         3
MESDAQ          Apple               98806 15-OCT-07         3

13 rows selected.

SQL>
SQL> REM Savepoint:
SQL> savepoint question4;

Savepoint created.

SQL>
SQL> REM Checking if updatable:
SQL> select COLUMN_NAME, UPDATABLE, INSERTABLE, DELETABLE
  2  from USER_UPDATABLE_COLUMNS
  3  where TABLE_NAME='PIE_FOOD';

COLUMN_NAME                    UPD INS DEL
------------------------------ --- --- ---
LNAME                          NO  NO  NO
FLAVOUR                        NO  NO  NO
REC_NO                         YES YES YES
RDATE                          NO  NO  NO
ORDINAL                        YES YES YES

SQL>
SQL> REM Insertion:
SQL> insert into Pie_Food values ('HOLMES','Lemon',83939,'21-OCT-2007',1);
insert into Pie_Food values ('HOLMES','Lemon',83939,'21-OCT-2007',1)
*
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table


SQL>
SQL> REM Insertion verification:
SQL> select * from Pie_Food;

LNAME           FLAVOUR             REC_NO RDATE       ORDINAL
--------------- ------------------- ---------- --------- ----------
LOGAN           Apple               39685 28-OCT-07         4
LOGAN           Apple               66227 10-OCT-07         2
ESPOSITA        Apple               48647 09-OCT-07         2
```

```
SLINGLAND       Apple                87454 21-OCT-07         1
SLINGLAND       Apple                47353 12-OCT-07         2
HELING          Apple                53376 30-OCT-07         3
HAFFERKAMP      Apple                50660 18-OCT-07         2
ARNN            Apple                11548 21-OCT-07         2
SOPKO           Apple                29226 26-OCT-07         2
SOPKO           Apple                51991 17-OCT-07         1
CRUZEN          Apple                39109 02-OCT-07         1

LNAME           FLAVOUR              REC_NO RDATE       ORDINAL
--------------- -------------------- ---------- --------- ----------
CRUZEN          Apple                44798 04-OCT-07         3
MESDAQ          Apple                98806 15-OCT-07         3

13 rows selected.

SQL>
SQL> REM Updation:
SQL> update Pie_Food set lname='NEWNAME' where lname='LOGAN';
update Pie_Food set lname='NEWNAME' where lname='LOGAN'
                *
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table


SQL> update Pie_Food set flavor='NEWFLAVOUR' where lname='LOGAN';
update Pie_Food set flavor='NEWFLAVOUR' where lname='LOGAN'
                *
ERROR at line 1:
ORA-00904: "FLAVOR": invalid identifier


SQL> update Pie_Food set rec_no=56789 where lname='LOGAN';
update Pie_Food set rec_no=56789 where lname='LOGAN'
*
ERROR at line 1:
ORA-02291: integrity constraint (1057.IT_FK1) violated - parent key not found


SQL> update Pie_Food set rdate='20-MAR-2007' where lname='LOGAN';
update Pie_Food set rdate='20-MAR-2007' where lname='LOGAN'
                *
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table


SQL> update Pie_Food set ordinal=10 where lname='LOGAN';

2 rows updated.
```

```
SQL>
SQL> REM Updation verification:
SQL> select * from Pie_Food;

LNAME             FLAVOUR              REC_NO RDATE       ORDINAL
------------------- -------------------- ---------- --------- ----------
LOGAN             Apple                 39685 28-OCT-07         10
LOGAN             Apple                 66227 10-OCT-07         10
ESPOSITA           Apple                 48647 09-OCT-07          2
SLINGLAND          Apple                 87454 21-OCT-07          1
SLINGLAND          Apple                 47353 12-OCT-07          2
HELING            Apple                 53376 30-OCT-07          3
HAFFERKAMP          Apple                 50660 18-OCT-07          2
ARNN              Apple                 11548 21-OCT-07          2
SOPKO             Apple                 29226 26-OCT-07          2
SOPKO             Apple                 51991 17-OCT-07          1
CRUZEN             Apple                 39109 02-OCT-07          1

LNAME             FLAVOUR              REC_NO RDATE       ORDINAL
------------------- -------------------- ---------- --------- ----------
CRUZEN             Apple                 44798 04-OCT-07          3
MESDAQ             Apple                 98806 15-OCT-07          3

13 rows selected.

SQL>
SQL> REM Deletion:
SQL> delete from Pie_Food where rec_no=56789;

0 rows deleted.

SQL>
SQL> REM Deletion verification:
SQL> select * from Pie_Food;

LNAME             FLAVOUR              REC_NO RDATE       ORDINAL
------------------- -------------------- ---------- --------- ----------
LOGAN             Apple                 39685 28-OCT-07         10
LOGAN             Apple                 66227 10-OCT-07         10
ESPOSITA           Apple                 48647 09-OCT-07          2
SLINGLAND          Apple                 87454 21-OCT-07          1
SLINGLAND          Apple                 47353 12-OCT-07          2
HELING            Apple                 53376 30-OCT-07          3
HAFFERKAMP          Apple                 50660 18-OCT-07          2
ARNN              Apple                 11548 21-OCT-07          2
SOPKO             Apple                 29226 26-OCT-07          2
SOPKO             Apple                 51991 17-OCT-07          1
CRUZEN             Apple                 39109 02-OCT-07          1

LNAME             FLAVOUR              REC_NO RDATE       ORDINAL
```

```
---------- ---------- ---------- --------- ----------
CRUZEN     Apple           44798 04-OCT-07         3
MESDAQ     Apple           98806 15-OCT-07         3

13 rows selected.

SQL> select * from receipts where rec_no=56789;

no rows selected

SQL>
SQL> REM Insertion in table:
SQL> insert into item_list values(11923,20,'70-MAR');

1 row created.

SQL>
SQL> REM Insertion verification:
SQL> select * from Pie_Food;

LNAME      FLAVOUR         REC_NO RDATE       ORDINAL
---------- ---------- ---------- --------- ----------
LOGAN      Apple           39685 28-OCT-07        10
LOGAN      Apple           66227 10-OCT-07        10
ESPOSITA   Apple           48647 09-OCT-07         2
SLINGLAND  Apple           87454 21-OCT-07         1
SLINGLAND  Apple           47353 12-OCT-07         2
HELING     Apple           53376 30-OCT-07         3
HAFFERKAMP Apple           50660 18-OCT-07         2
ARNN       Apple           11548 21-OCT-07         2
SOPKO      Apple           29226 26-OCT-07         2
SOPKO      Apple           51991 17-OCT-07         1
CRUZEN     Apple           39109 02-OCT-07         1

LNAME      FLAVOUR         REC_NO RDATE       ORDINAL
---------- ---------- ---------- --------- ----------
CRUZEN     Apple           44798 04-OCT-07         3
MESDAQ     Apple           98806 15-OCT-07         3

13 rows selected.

SQL> select * from item_list where item='70-MAR';

    REC_NO    ORDINAL ITEM
---------- ---------- --------------------
     59716          2 70-MAR
     66227          3 70-MAR
     38157          1 70-MAR
     31874          1 70-MAR
     31874          2 70-MAR
```

```
    72207         1 70-MAR
    77032         4 70-MAR
    15286         1 70-MAR
    17685         4 70-MAR
    70162         4 70-MAR
    74741         3 70-MAR

   REC_NO    ORDINAL ITEM
---------- ---------- --------------------
    61948         1 70-MAR
    95514         3 70-MAR
    97097         1 70-MAR
    16532         2 70-MAR
    11923        20 70-MAR

16 rows selected.

SQL>
SQL> REM Deletion in table:
SQL> delete from Pie_Food where item='70-MAR';
delete from Pie_Food where item='70-MAR'
                   *
ERROR at line 1:
ORA-00904: "ITEM": invalid identifier


SQL>
SQL> REM Deletion verification:
SQL> select * from Pie_Food;

LNAME              FLAVOUR              REC_NO RDATE       ORDINAL
-------------------- -------------------- ---------- --------- ----------
LOGAN              Apple                39685 28-OCT-07        10
LOGAN              Apple                66227 10-OCT-07        10
ESPOSITA           Apple                48647 09-OCT-07         2
SLINGLAND          Apple                87454 21-OCT-07         1
SLINGLAND          Apple                47353 12-OCT-07         2
HELING             Apple                53376 30-OCT-07         3
HAFFERKAMP         Apple                50660 18-OCT-07         2
ARNN               Apple                11548 21-OCT-07         2
SOPKO              Apple                29226 26-OCT-07         2
SOPKO              Apple                51991 17-OCT-07         1
CRUZEN             Apple                39109 02-OCT-07         1

LNAME              FLAVOUR              REC_NO RDATE       ORDINAL
-------------------- -------------------- ---------- --------- ----------
CRUZEN             Apple                44798 04-OCT-07         3
MESDAQ             Apple                98806 15-OCT-07         3

13 rows selected.
```

```
SQL> select * from item_list where item='70-MAR';

   REC_NO    ORDINAL ITEM
--------- ---------- --------------------
    59716          2 70-MAR
    66227          3 70-MAR
    38157          1 70-MAR
    31874          1 70-MAR
    31874          2 70-MAR
    72207          1 70-MAR
    77032          4 70-MAR
    15286          1 70-MAR
    17685          4 70-MAR
    70162          4 70-MAR
    74741          3 70-MAR

   REC_NO    ORDINAL ITEM
--------- ---------- --------------------
    61948          1 70-MAR
    95514          3 70-MAR
    97097          1 70-MAR
    16532          2 70-MAR
    11923         20 70-MAR

16 rows selected.

SQL>
SQL> rollback to question4;

Rollback complete.

SQL>
SQL> REM *INFERENCE:*
SQL> REM Insertion: Insertion in the view is only allowed for the key preserved columns. (Note
that rec_no with ordinal is a composite key.) Insertion in the parent table is reflected in both.
SQL> REM Updation: Updation in the view is only allowed in key preserved columns. Updation in
the main table is reflected in both.
SQL> REM Deletion: Deletion in the view is updated in the view alone. Deletion in the parent table
is not reflected in the view.
SQL>


SQL>
SQL> REM 5. Create a view Cheap_View from Cheap_Food that shows only the product id, flavor
and food.
SQL>
SQL> REM Creating view:
SQL> create or replace view Cheap_View as
  2  select prod_id, flavour, food from Cheap_Food;
```

```
View created.

SQL>
SQL> REM Displaying view:
SQL> select * from Cheap_View;

PROD_ID            FLAVOUR            FOOD
------------------- ------------------- --------------------
70-LEM              Lemon              Cookie
70-W                Walnut             Cookie

SQL>
SQL> REM Savepoint:
SQL> savepoint question5;

Savepoint created.

SQL>
SQL> REM Checking if updatable:
SQL> select COLUMN_NAME, UPDATABLE, INSERTABLE, DELETABLE
  2  from USER_UPDATABLE_COLUMNS
  3  where TABLE_NAME='CHEAP_VIEW';

COLUMN_NAME                    UPD INS DEL
------------------------------ --- --- ---
PROD_ID                        YES YES YES
FLAVOUR                        YES YES YES
FOOD                           YES YES YES

SQL>
SQL> REM Insertion:
SQL> insert into Cheap_View values ('61-GC','Strawberry','Cake');
insert into Cheap_View values ('61-GC','Strawberry','Cake')
            *
ERROR at line 1:
ORA-01402: view WITH CHECK OPTION where-clause violation


SQL>
SQL> REM Insertion verification:
SQL> select * from Cheap_View;

PROD_ID            FLAVOUR            FOOD
------------------- ------------------- --------------------
70-LEM              Lemon              Cookie
70-W                Walnut             Cookie

SQL> select * from products where prod_id='61-GC';
```

```
no rows selected

SQL>
SQL> REM Updation:
SQL> update Cheap_View set prod_id='61-BLU' where prod_id='61-GC';

0 rows updated.

SQL> update Cheap_View set flavour='Banana' where prod_id='61-BLU';

0 rows updated.

SQL> update Cheap_View set food='Cake' where prod_id='61-BLU';

0 rows updated.

SQL>
SQL> REM Updation verification:
SQL> select * from Cheap_View where prod_id='61-BLU';

no rows selected

SQL> select * from products where prod_id='61-BLU';

no rows selected

SQL>
SQL> REM Deletion:
SQL> delete from Cheap_View where prod_id='61-BLU';

0 rows deleted.

SQL>
SQL> REM Deletion verification:
SQL> select * from Cheap_View;

PROD_ID            FLAVOUR            FOOD
------------------ ------------------ ------------------
70-LEM              Lemon              Cookie
70-W                Walnut             Cookie

SQL> select * from products where prod_id='61-BLU';

no rows selected

SQL>
SQL> REM Insertion in table:
SQL> insert into products values('88-SS-10','Blueberry','Cone', 2.95);

1 row created.
```

```
SQL>
SQL> REM Insertion verification:
SQL> select * from Cheap_View;

PROD_ID            FLAVOUR            FOOD
------------------- ------------------- -------------------
70-LEM             Lemon              Cookie
70-W               Walnut             Cookie

SQL> select * from products where prod_id='88-SS-10';

PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- ------------------- ------------------- ----------
88-SS-10           Blueberry          Cone                 2.95

SQL>
SQL> REM Updation in table:
SQL> update products set prod_id='61-BLU' where prod_id='88-SS-10';

1 row updated.

SQL> update products set flavour='Chocolate' where prod_id='61-BLU';

1 row updated.

SQL> update products set price=4.25 where prod_id='61-BLU';

1 row updated.

SQL>
SQL> REM Updation verification:
SQL> select * from Cheap_View where prod_id='61-BLU';

no rows selected

SQL> select * from products where prod_id='61-BLU';

PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- ------------------- ------------------- ----------
61-BLU             Chocolate          Cone                 4.25

SQL>
SQL> REM Deletion in table:
SQL> delete from Cheap_View where prod_id='61-BLU';

0 rows deleted.

SQL>
SQL> REM Deletion verification:
```

```
SQL> select * from Cheap_View;

PROD_ID            FLAVOUR            FOOD
------------------- ------------------- --------------------
70-LEM              Lemon              Cookie
70-W                Walnut             Cookie

SQL> select * from products where prod_id='61-BLU';

PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- ------------------- -------------------- ----------
61-BLU              Chocolate          Cone                   4.25

SQL>
SQL> rollback to question5;

Rollback complete.

SQL>
SQL> REM *INFERENCE:*
SQL> REM Insertion: Insertions into both the view and the parent table are reflected in both.
Products with price > 1 are not allowed due to the 'with check' option in the view.
SQL> REM Updation: Key preserved. All the attributes in the view are updatable and updations in
the main table are reflected in both.
SQL> REM Deletion: Deletions in both the view and the parent table are reflected in both.
SQL>


SQL>
SQL> REM 6. Drop the view Cheap_View.
SQL>
SQL> drop view Cheap_View;

View dropped.

SQL> select * from Cheap_View;
select * from Cheap_View
          *
ERROR at line 1:
ORA-00942: table or view does not exist


SQL>
SQL>
SQL> REM ********************** END OF FILE *******************************
```