```
@E:084 A4.sql
SQL> REM 1. Create a view Schedule 15 that display the flight number, route, airport(origin, destination)
SQL> REM departure (date, time), arrival (date, time) of a flight on 15 apr 2005. Label the view
SQL> REM column as flight, route, from airport, to airport, ddate, dtime, adate, atime respectively
SOL>
SQL> CREATE OR REPLACE VIEW Schedule 15 AS
 2 (
 3 SELECT f.flightNo AS flight,
       r.routeID AS route,
 4
 5
       r.orig airport AS from airport,
      r.dest_airport AS to airport,
 6
 7
       s.departs AS DDATE,
       s.dtime AS DTIME,
 8
 9
       s.arrives AS ADATE,
       s.atime AS ATIME
10
11 FROM flights f, fl schedule s, routes r
12 WHERE r.routeID = f.rid AND f.flightNo = s.flno AND departs = '15-APR-05'
13);
View created.
SQL>
SQL> REM View Contents
SOL>
SQL> SELECT * FROM Schedule 15;
                                                                      DTIME ADATE
                                                                                          ATIME
FLIGHT ROUTE FROM AIRPORT
                                      TO AIRPORT
                                                         DDATE
JJ-2482 LW100 Los Angeles
                               Washington D.C. 15-APR-05
                                                               1230 15-APR-05
                                                                                  1540
SQ-11 LT105 Los Angeles
                              Tokyo
                                            15-APR-05
                                                          1230 16-APR-05
                                                                             2055
HA-1 LH106 Los Angeles
                              Honolulu
                                             15-APR-05
                                                           1110 15-APR-05
                                                                              1445
A5-3246 CN151 Chicago
                              New York
                                             15-APR-05
                                                           1810 15-APR-05
                                                                              1900
9E-3851 MD200 Madison
                                                          1035 15-APR-05
                              Detroit
                                            15-APR-05
                                                                             1140
MQ-4477 DN250 Detroit
                              New York
                                             15-APR-05
                                                          1510 15-APR-05
                                                                              1600
RP-5018 MC201 Madison
                              Chicago
                                             15-APR-05
                                                           2100 15-APR-05
                                                                              2155
BA-178 NYL400 New York
                                London
                                               15-APR-05
                                                            1140 16-APR-05
                                                                               1020
8 rows selected.
SOL>
SQL> SAVEPOINT S1;
Savepoint created.
SOL>
SQL> REM Insering check
SOL>
SQL> INSERT INTO Schedule 15 VALUES('WN-484','LC101','Los Angeles','Chicago','15-APR-05',2140,'17-AP
R-05',0600);
INSERT INTO Schedule 15 VALUES('WN-484','LC101','Los Angeles','Chicago','15-APR-05',2140,'17-APR-05',0
600)
```

```
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table
******
SQL> REM Updating Check
SOL>
SQL> SAVEPOINT S2;
Savepoint created.
SQL>
SQL> REM Before Updating
SOL>
SQL> SELECT * FROM schedule 15 WHERE flight='BA-178';
FLIGHT ROUTE FROM_AIRPORT TO_AIRPORT DDATE DTIME ADATE
                                                                             ATIME
BA-178 NYL400 New York London 15-APR-05 1140 16-APR-05
                                                                  1020
SQL> SELECT * FROM fl schedule WHERE flno='BA-178';
FLNO DEPARTS DTIME ARRIVES ATIME
                                             PRICE
BA-178 15-APR-05 1140 16-APR-05 1020
                                         250.5
SQL>
SQL> REM flight,route, from airport, to airport are not updatable columns
SOL>
SQL> UPDATE Schedule 15 SET flight = 'HA-1' WHERE flight='BA-178';
UPDATE Schedule 15 SET flight = 'HA-1' WHERE flight='BA-178'
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table
SQL> UPDATE Schedule 15 SET route = 'LW100' WHERE flight='BA-178';
UPDATE Schedule 15 SET route = 'LW100' WHERE flight='BA-178'
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table
SQL> UPDATE Schedule 15 SET from airport = 'Chicago' WHERE flight='BA-178';
UPDATE Schedule 15 SET from airport = 'Chicago' WHERE flight='BA-178'
```

SQL> UPDATE Schedule 15 SET to airport = 'Chicago' WHERE flight='BA-178';

ORA-01779: cannot modify a column which maps to a non key-preserved table

ERROR at line 1:

```
UPDATE Schedule 15 SET to airport = 'Chicago' WHERE flight='BA-178'
ERROR at line 1:
ORA-01779: cannot modify a column which maps to a non key-preserved table
SQL>
SQL> REM ddate, dtime, adate, atime are updatable columns
SQL> UPDATE Schedule 15 SET ddate = '15-APR-05', dtime = 1200, adate = '27-APR-05', atime = 1600 WHERE fl
ight='BA-178';
1 row updated.
SOL>
SQL> REM After Updating
SQL> SELECT * FROM schedule 15 WHERE flight='BA-178';
FLIGHT ROUTE FROM_AIRPORT TO_AIRPORT DDATE DTIME ADATE
                                                                              ATIME
BA-178 NYL400 New York London 15-APR-05 1200 27-APR-05 1600
SQL> SELECT * FROM fl schedule WHERE flno='BA-178';
FLNO DEPARTS DTIME ARRIVES ATIME
                                             PRICE
BA-178 15-APR-05 1200 27-APR-05 1600
                                         250.5
SQL>
SQL> REM Delete Check
SOL>
SQL> DELETE FROM Schedule 15 WHERE flight='BA-178';
1 row deleted.
SQL> SELECT * FROM fl schedule WHERE flno='BA-178';
no rows selected
SQL>
SQL> ROLLBACK TO S1;
Rollback complete.
SQL> REM The above view is a updatable join view
SOL>
SQL>
SQL> REM 2. Define a view Airtype that display the number of aircrafts for each of its type. Label the
SQL> REM column as craft type, total.
SOL>
SQL> CREATE OR REPLACE VIEW Airtype AS(
```

- 2 SELECT a.type AS CRAFT_TYPE, count(*) AS TOTAL
- 3 FROM aircraft a
- 4 GROUP BY a.type);

View created.

SQL>

SQL> REM Display tables before operations

SQL>

SQL> SELECT * FROM Airtype;

CRAFT_TY	PE	TOTAL
Boeing	6	
Saab	1	
Airbus	3	
BAe	1	
Schweizer	1	-
Piper	1	
Lockheed	1	
Tupolev	1	
Embraer	1	

9 rows selected.

SQL> SELECT * FROM Aircraft;

AID ANAME		CRUISINGRANGE
1 Boeing 747-400	Boeing	8430
2 Boeing 737-800	Boeing	3383
3 Airbus A340-300	Airbus	7120
4 British Aerospace Jetstre	eam 41 BAe	1502
5 Embraer ERJ-145	Embraer	1530
6 SAAB 340	Saab	2128
7 Piper PA-46 Meridian	Piper	520
8 Tupolev Tu-154	Tupolev	4103
16 Schweizer 2-33	Schweizer	300
9 Lockheed L1011 Tristar	Lockhe	ed 6900
10 Boeing 757-300	Boeing	4010
AID ANAME		CRUISINGRANGE
11 Boeing 777-300	Boeing	6441
12 Boeing 767-400ER	Boeing	6475
13 Airbus A320	Airbus	2605
14 Airbus A319	Airbus	1805
15 Boeing 727	Boeing	1504

16 rows selected.

```
SQL> SAVEPOINT S2;
Savepoint created.
SOL>
SQL> REM Insert check: NOT possible
SQL>
SQL> INSERT INTO Airtype values ('Aircar', 100);
INSERT INTO Airtype values ('Aircar', 100)
ERROR at line 1:
ORA-01733: virtual column not allowed here
******
SQL> REM Update check: Non updatable
SQL> UPDATE Airtype SET craft type='Aircar' WHERE total=3;
UPDATE Airtype SET craft type='Aircar' WHERE total=3
ERROR at line 1:
ORA-01732: data manipulation operation not legal on this view
SQL>
******
SQL> REM Delete Check: Not possible
SQL> DELETE FROM Airtype WHERE total=6;
DELETE FROM Airtype WHERE total=6
ERROR at line 1:
ORA-01732: data manipulation operation not legal on this view
******
SQL> REM Table after operations
SQL> SELECT * FROM Airtype;
CRAFT_TYPE
           TOTAL
Boeing
         6
Saab
         1
Airbus
         3
BAe
Schweizer 1
Piper
Lockheed
         1
Tupolev
          1
Embraer
         1
```

SQL> SELECT * FROM Aircraft;

SQL SELECT TROWN MICE	ιιι,	
AID ANAME	TYPE	CRUISINGRANGE
1 Boeing 747-400	Boeing	8430
2 Boeing 737-800	Boeing	3383
3 Airbus A340-300	Airbus	7120
4 British Aerospace Jetstre	eam 41 BAe	1502
5 Embraer ERJ-145	Embraer	1530
6 SAAB 340	Saab	2128
7 Piper PA-46 Meridian	Piper	520
8 Tupolev Tu-154	Tupolev	4103
16 Schweizer 2-33	Schweizer	r 300
9 Lockheed L1011 Tristar	Lockhe	eed 6900
10 Boeing 757-300	Boeing	4010
AID ANAME	ТҮРЕ	CRUISINGRANGE
11 Boeing 777-300	Boeing	6441
12 Boeing 767-400ER	Boeing	
13 Airbus A320	Airbus	2605
14 Airbus A319	Airbus	1805
15 Boeing 727	Boeing	1504
16 rows selected.		
SQL>		
SQL> ROLLBACK TO S2;		
Rollback complete.		
SQL>		
*	a non updata	able view as it is made up of aggregate function
SOL>	-	. 55 5
SQL> REM ***********************************	*****	*********************
SQL>		
SQL>		
_	sangeles Ro	oute that contains Los Angeles in the route. Ensure that the view
		ormation about the Los Angeles route.
SQL>	ws only into	annuton uoout me 2001 mgetes route.
SQL> CREATE OR REPLACE	VIEW Losa	angeles Route AS(
2 SELECT routeID,	,	<u>6</u> (
3 orig_airport AS from_ai	irport,	
4 dest airport AS to airpo		
5 distance	,	

7 WHERE (orig_airport IN ('Los Angeles') OR dest_airport IN ('Los Angeles'))) 8 WITH CHECK OPTION;

6 FROM routes

View created. SQL> SQL> SELECT * FROM Losangeles_Route; ROUTEI FROM_AIRPORT TO AIRPORT **DISTANCE** _____ LW100 Los Angeles Washington D.C. 2308 LC101 Los Angeles Chicago 1749 LD102 Los Angeles Dallas 1251 2606 7487 5478 LB103 Los Angeles Boston LS104 Los Angeles Sydney LT105 Los Angeles Tokyo Honolulu LH106 Los Angeles 2551 CL150 Chicago Los Angeles 1749 LNY107 Los Angeles New York 2510 9 rows selected SQL> SQL> SAVEPOINT S3; Savepoint created. ****** SQL> REM Before Insert SQL> SELECT * FROM Routes where routeID='BV099'; no rows selected SQL> SQL> REM Insert possible SQL> INSERT INTO Losangeles Route VALUES ('BV099', 'Los Angeles', 'Houston', 4200); 1 row created. SQL> SOL> REM After Insert SQL> SELECT * FROM Routes where routeID='BV099'; ROUTEI ORIG_AIRPORT DEST_AIRPORT **DISTANCE** BV099 Los Angeles Houston 4200 SQL> SELECT * FROM Losangeles Route where routeID='BV099';

DISTANCE

4200

ROUTEI FROM_AIRPORT TO_AIRPORT

BV099 Los Angeles Houston

SQL> REM Update Check: Possible on all columns

SQL>

SQL> REM Before Update

SQL> SELECT * FROM Losangeles Route;

ROUTEI FROM_AIRPORT TO_AIRPORT DISTANCE

LW100 Los Angeles	Washington D.C.	2308
LC101 Los Angeles	Chicago	1749
LD102 Los Angeles	Dallas	1251
LB103 Los Angeles	Boston	2606
LS104 Los Angeles	Sydney	7487
LT105 Los Angeles	Tokyo	5478
LH106 Los Angeles	Honolulu	2551
CL150 Chicago	Los Angeles	1749
LNY107 Los Angeles	New York	2510
BV099 Los Angeles	Houston	4200

10 rows selected.

SQL> SELECT * FROM routes WHERE orig_airport = 'Los Angeles' OR dest_airport = 'Los Angeles';

ROUTEI ORIG_AIRPORT DEST_AIRPORT DISTANCE

LW100 Los Angeles	Washington D.C.	2308
LC101 Los Angeles	Chicago	1749
LD102 Los Angeles	Dallas	1251
LB103 Los Angeles	Boston	2606
LS104 Los Angeles	Sydney	7487
LT105 Los Angeles	Tokyo	5478
LH106 Los Angeles	Honolulu	2551
CL150 Chicago	Los Angeles	1749
LNY107 Los Angeles	New York	2510
BV099 Los Angeles	Houston	4200

10 rows selected.

SQL>

SQL>

SQL> UPDATE Losangeles Route

- 2 SET routeID = 'LE069',
- 3 from_airport = 'Los Angeles',
- 4 to airport = 'Boston',
- 5 distance = 1420
- 6 WHERE routeID = 'BV099';

1 row updated.

SOL>

SQL> REM After Update

LW100 Los Angeles	Washington D.C.	2308	
LC101 Los Angeles	Chicago	1749	
LD102 Los Angeles	Dallas	1251	
LB103 Los Angeles	Boston	2606	
LS104 Los Angeles	Sydney	7487	
LT105 Los Angeles	Tokyo	5478	
LH106 Los Angeles	Honolulu	2551	
CL150 Chicago	Los Angeles	1749	
LNY107 Los Angeles	New York	2510	
LE069 Los Angeles	Boston	1420	
10 rows selected.			

SQL> SELECT * FROM routes WHERE orig_airport = 'Los Angeles' OR dest_airport = 'Los Angeles';

ROUTEI ORIG_AIRPO	ORT DEST_AIRI	PORT	DISTANCE
LW100 Los Angeles	Washington D.C.	2308	
LC101 Los Angeles	Chicago	1749	
LD102 Los Angeles	Dallas	1251	
LB103 Los Angeles	Boston	2606	
LS104 Los Angeles	Sydney	7487	
LT105 Los Angeles	Tokyo	5478	
LH106 Los Angeles	Honolulu	2551	
CL150 Chicago	Los Angeles	1749	
LNY107 Los Angeles	New York	2510	
LE069 Los Angeles	Boston	1420	
_			

10 rows selected.

SQL>

SQL> REM Delete Check:Possible

SOL>

SQL> DELETE FROM Losangeles_Route WHERE routeID = 'LE069';

1 row deleted.

SQL>

SQL> SELECT * FROM Losangeles_Route;

ROUTEI FROM_AIRF	PORT TO_AIRPO	ORT	DISTANCE
LW100 Los Angeles	Washington D.C.	230	8
LC101 Los Angeles	Chicago	1749	
LD102 Los Angeles	Dallas	1251	
LB103 Los Angeles	Boston	2606	
LS104 Los Angeles	Sydney	7487	
LT105 Los Angeles	Tokyo	5478	

LH106 Los AngelesHonolulu2551CL150 ChicagoLos Angeles1749LNY107 Los AngelesNew York2510

9 rows selected.

SQL> SELECT * FROM routes WHERE orig_airport = 'Los Angeles' OR dest_airport = 'Los Angeles';

ROUTEI ORIG_AIRPO		0_ 1	DISTANCE
LW100 Los Angeles LC101 Los Angeles LD102 Los Angeles LB103 Los Angeles LS104 Los Angeles LT105 Los Angeles LH106 Los Angeles CL150 Chicago LNY107 Los Angeles	Washington D.C Chicago Dallas Boston Sydney Tokyo Honolulu Los Angeles New York	230 1749 1251 2606 7487 5478 2551 1749 2510	8
9 rows selected.			
SQL> SQL> SQL> ROLLBACK TO) S3;		
Rollback complete.			
************ SQL> SQL> REM 4. Create a SQL> REM departure (SQL> SQL> CREATE OR RE 2 SELECT flight, 3 ddate, 4 dtime,	************* view named Losang (date, time), arrival (d	eles_Flight date, time) o	on Schedule_15 (as defined in 1) that display flight, flight(s) from Los Angeles. tht AS(
5 adate, 6 atime 7 FROM Schedule_1: 8 WHERE from_airpo));	
View created			

View created.

SQL> SQL> SELECT * FROM Losangeles_Flight;

FLIGHT DDATE DTIME ADATE ATIME
JJ-2482 15-APR-05 1230 15-APR-05 1540
SQ-11 15-APR-05 1230 16-APR-05 2055 HA-1 15-APR-05 1110 15-APR-05 1445
SQL> REM ***********************************
Savepoint created.
SQL> REM:Insert Check:Not possible SQL> SQL> INSERT INTO Losangeles_Flight VALUES('VG-1000','14-APR-05',0010,'15-APR-05',0010); INSERT INTO Losangeles_Flight VALUES('VG-1000','14-APR-05',0010,'15-APR-05',0010) *
ERROR at line 1: ORA-01779: cannot modify a column which maps to a non key-preserved table
SQL> SQL> REM ***********************************
SQL> REM Update Check atime,adate,dtime,ddate are updatable SQL>
SQL> REM Before update SQL> SELECT * from Schedule 15 WHERE flight='SQ-11';
FLIGHT ROUTE FROM_AIRPORT TO_AIRPORT DDATE DTIME ADATE ATIME
SQ-11 LT105 Los Angeles Tokyo 15-APR-05 1230 16-APR-05 2055
SQL> SELECT * FROM fl_schedule WHERE flno='SQ-11';
FLNO DEPARTS DTIME ARRIVES ATIME PRICE
SQ-11 15-APR-05 1230 16-APR-05 2055 780.99
SQL> UPDATE Losangeles_Flight SET flight = 'HA-1' WHERE flight = 'SQ-11'; UPDATE Losangeles_Flight SET flight = 'HA-1' WHERE flight = 'SQ-11' *
ERROR at line 1: ORA-01779: cannot modify a column which maps to a non key-preserved table
SQL> UPDATE Losangeles_Flight SET ddate = '15-APR-05',dtime = 1330,adate = '17-APR-05',atime = 1440 WH ERE flight = 'SQ-11';

1 row updated.

SQL>

SQL> REM After update

SQL> SELECT * from Schedule_15 WHERE flight='SQ-11';

FLIGHT ROUTE FROM_AIRPORT TO_AIRPORT DDATE DTIME ADATE ATIME

SQ-11 LT105 Los Angeles Tokyo 15-APR-05 1330 17-APR-05 1440

SQL> SELECT * FROM fl_schedule WHERE flno='SQ-11';

FLNO DEPARTS DTIME ARRIVES ATIME PRICE

SQ-11 15-APR-05 1330 17-APR-05 1440 780.99

SQL> SELECT * FROM Losangeles Flight;

FLIGHT DDATE DTIME ADATE ATIME

JJ-2482 15-APR-05 1230 15-APR-05 1540

SQ-11 15-APR-05 1330 17-APR-05 1440

HA-1 15-APR-05 1110 15-APR-05 1445

SQL> REM DELETION CHECK:possible

SQL>

SQL> SELECT * FROM fl schedule WHERE flno='JJ-2482';

FLNO DEPARTS DTIME ARRIVES ATIME PRICE

JJ-2482 15-APR-05 1230 15-APR-05 1540 235.98 JJ-2482 22-APR-05 1230 22-APR-05 1540 235.98

SQL> SELECT * from Schedule 15 WHERE flight='JJ-2482';

FLIGHT ROUTE FROM_AIRPORT TO_AIRPORT DDATE DTIME ADATE ATIME

_ _

JJ-2482 LW100 Los Angeles Washington D.C. 15-APR-05 1230 15-APR-05 1540

SQL> DELETE FROM Losangeles Flight WHERE flight = 'JJ-2482';

1 row deleted.

SQL> SELECT * from Schedule_15 WHERE flight='JJ-2482';

no rows selected

SQL> SELECT * FROM fl schedule WHERE flno='JJ-2482';

FLNO DEPARTS DTIME ARRIVES ATIME PRICE

JJ-2482 22-APR-05 1230 22-APR-05 1540 235.98	
SQL> ROLLBACK TO S4;	
Rollback complete.	
SQL> REM It is a updatable join view SQL> SQL> REM ***********************************	*****
SQL> SQL> SQL> SQL>	