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DBMS TASK - 5 REPORT

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ABSTRACT

The aim of this task is to implement and demonstrate **different types of SQL joins** on the *Sailors–Boats–Reserves* database.

Joins are used to combine rows from two or more tables based on a related column, enabling retrieval of meaningful relationships between entities.

This task includes examples of **Simple (Equi) Join**, **Non-Equi Join**, **Self Join**, **Inner Join (Two and Three Tables)**, **Left Join**, **Right Join**, **Full Outer Join**, and **Cross Join**.

Through these queries, we can observe how relational data can be accessed and analyzed across multiple related tables.

1. Create Tables

```
CREATE TABLE Sailors (
   sid NUMBER(10) PRIMARY KEY,
   sname VARCHAR2(32),
   rating NUMBER(3),
   age NUMBER(5,1)
);
```

```
SQL> desc sailors;
 Name                      Null?    Type
 SID                       NOT NULL NUMBER(10)
 SNAME                              VARCHAR2(32)
 RATING                             NUMBER(3)
 AGE                                NUMBER(5,1)
```

```
CREATE TABLE Boats (
   bid NUMBER(10) PRIMARY KEY,
   bname VARCHAR2(32),
   color VARCHAR2(32)
);
```

```
SQL> desc reserves;
 Name                      Null?    Type
 SID                       NOT NULL NUMBER(10)
 BID                       NOT NULL NUMBER(10)
 DAY                       NOT NULL DATE
```

```
CREATE TABLE Reserves (
   sid NUMBER(10),
   bid NUMBER(10),
   day DATE,
   PRIMARY KEY (sid, bid, day),
```

```
   CONSTRAINT fk_sid FOREIGN KEY (sid) REFERENCES Sailors(sid),
   CONSTRAINT fk_bid FOREIGN KEY (bid) REFERENCES Boats(bid)
);
```

```
SQL> desc boats
 Name                      Null?    Type
 BID                       NOT NULL NUMBER(10)
 BNAME                              VARCHAR2(32)
 COLOR                              VARCHAR2(32)
```

```
-- Sailors Data
INSERT INTO Sailors VALUES (22, 'Dustin', 7, 45.0);
INSERT INTO Sailors VALUES (29, 'Brutus', 1, 33);
INSERT INTO Sailors VALUES (31, 'Lubber', 8, 55.5);
INSERT INTO Sailors VALUES (32, 'Andy', 8, 25.5);
INSERT INTO Sailors VALUES (58, 'Rusty', 10, 35);
INSERT INTO Sailors VALUES (64, 'Horatio', 7, 35);
INSERT INTO Sailors VALUES (71, 'Zorba', 10, 16);
INSERT INTO Sailors VALUES (74, 'Horatio', 9, 40);
INSERT INTO Sailors VALUES (85, 'Art', 3, 25.5);
INSERT INTO Sailors VALUES (95, 'Bob', 3, 63.5);
```

SQL> select*from sailors;

SID	SNAME	RATING	AGE
22	Dustin	7	45
29	Brutus	1	33
31	Lubber	8	55.5
32	Andy	8	25.5
58	Rusty	10	35
64	Horatio	7	35
71	Zorba	10	16
74	Horatio	9	40
85	Art	3	25.5
95	Bob	3	63.5

-- Boats Data

INSERT INTO Boats VALUES (101, 'Interlake', 'Blue');

INSERT INTO Boats VALUES (102, 'Interlake', 'Red');

INSERT INTO Boats VALUES (103, 'Clipper', 'Green');

INSERT INTO Boats VALUES (104, 'Marine', 'Red');

SQL> select*from boats;

BID	BNAME	COLOR
101	Interlake	Blue
102	Interlake	Red
103	Clipper	Green
104	Marine	Red

-- Reserves Data

INSERT INTO Reserves VALUES (22, 101, DATE '1998-10-10');

INSERT INTO Reserves VALUES (22, 102, DATE '1998-10-10');

INSERT INTO Reserves VALUES (22, 103, DATE '1998-10-08');

INSERT INTO Reserves VALUES (22, 104, DATE '1998-10-07');

INSERT INTO Reserves VALUES (22, 102, DATE '1998-11-10');

INSERT INTO Reserves VALUES (31, 103, DATE '1998-11-06');

INSERT INTO Reserves VALUES (31, 104, DATE '1998-11-12');

INSERT INTO Reserves VALUES (64, 101, DATE '1998-09-05');

INSERT INTO Reserves VALUES (64, 102, DATE '1998-09-08');

INSERT INTO Reserves VALUES (74, 103, DATE '1998-09-08');

SQL> select*from reserves;

SID	BID	DAY
22	101	10-OCT-98
22	102	10-OCT-98
22	103	08-OCT-98
22	104	07-OCT-98
22	102	10-NOV-98
31	103	06-NOV-98
31	104	12-NOV-98
64	101	05-SEP-98
64	102	08-SEP-98
74	103	08-SEP-98

JOIN QUERIES

1. Simple / Equi Join

```
SELECT S.*
FROM Sailors S
INNER JOIN Reserves R ON S.sid = R.sid
WHERE R.bid = 103;
```

SID	SNAME	RATING	AGE
22	Dustin	7	45
31	Lubber	8	55.5
74	Horatio	9	40

2. Non-Equi Join

```
SELECT S.*
FROM Sailors S
INNER JOIN Reserves R ON S.sid = R.sid
WHERE R.bid <> 103;
```

SID	SNAME	RATING	AGE
22	Dustin	7	45
22	Dustin	7	45
22	Dustin	7	45
22	Dustin	7	45
31	Lubber	8	55.5
64	Horatio	7	35
64	Horatio	7	35

3. Self Join

```
SELECT X.sname AS Sailor1,
       Y.sname AS Sailor2,
       X.age AS Age1,
       Y.age AS Age2
FROM Sailors X
JOIN Sailors Y ON X.sid <> Y.sid AND X.age > Y.age;
```

```
SAILOR1                        SAILOR2                        AGE1
------------------------------ ------------------------------ ----------
    AGE2
----------
Bob                            Lubber                         63.5
     55.5

Bob                            Dustin                         63.5
      45

Bob                            Horatio                        63.5
      40
```

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Bob Rusty 63.5

35

Bob Horatio 63.5

35

Bob Brutus 63.5

33

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Bob Art 63.5

25.5

Bob Andy 63.5

25.5

Bob Zorba 63.5

16

SAILOR1 SAILOR2 AGE1

---------- ---------- ----------

AGE2

Lubber Dustin 55.5

45

Lubber Horatio 55.5

40

Lubber Rusty 55.5

35

SAILOR1 SAILOR2 AGE1

------------------------------ ------------------------------ ----------

AGE2

Lubber Horatio 55.5

35

Lubber Brutus 55.5

33

Lubber Art 55.5

25.5

SAILOR1 SAILOR2 AGE1

------------------------------ ------------------------------ ----------

AGE2

Lubber Andy 55.5

25.5

Lubber Zorba 55.5

16

Dustin Horatio 45

40

SAILOR1 SAILOR2 AGE1

---------- ---------- ----------

AGE2

Dustin Rusty 45

35

Dustin Horatio 45

35

Dustin Brutus 45

33

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Dustin Art 45

25.5

Dustin Andy 45

25.5

Dustin Zorba 45

16

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Horatio Rusty 40

35

Horatio Horatio 40
35

Horatio Brutus 40
33

SAILOR1 SAILOR2 AGE1
---------- ---------- ----------
AGE2

Horatio Art 40
25.5

Horatio Andy 40
25.5

Horatio Zorba 40
16

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Rusty Brutus 35

33

Rusty Art 35

25.5

Rusty Andy 35

25.5

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Rusty Zorba 35

16

Horatio Brutus 35

33

Horatio Art 35

25.5

SAILOR1 SAILOR2 AGE1

---------- ---------- ----------

AGE2

Horatio Andy 35

25.5

Horatio Zorba 35

16

Brutus Art 33

25.5

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Brutus Andy 33

25.5

Brutus Zorba 33

16

Art Zorba 25.5

16

SAILOR1 SAILOR2 AGE1

--- --- ---

AGE2

Andy Zorba 25.5

4.Inner Join (Two Tables)

SELECT S.sname, R.bid

FROM Sailors S

```
INNER JOIN Reserves R ON S.sid = R.sid;
```

SNAME	BID
Dustin	101
Dustin	102
Dustin	103
Dustin	104
Dustin	102
Lubber	103
Lubber	104
Horatio	101
Horatio	102
Horatio	103

5. Inner Join (Three Tables)

```
SELECT B.bname
FROM Sailors S
INNER JOIN Reserves R ON S.sid = R.sid
INNER JOIN Boats B ON R.bid = B.bid
WHERE S.sname = 'Lubber';
```

BNAME

Clipper

Marine

6. Left Outer Join

SELECT S.sname, R.bid

FROM Sailors S

LEFT JOIN Reserves R ON S.sid = R.sid;

SNAME	BID
Dustin	101
Dustin	102
Dustin	103
Dustin	104
Dustin	102
Lubber	103
Lubber	104
Horatio	101
Horatio	102
Horatio	103

Rusty

SNAME	BID
Zorba	
Art	
Brutus	
Bob	
Andy	

7. Right Outer Join

```
SELECT S.sname, R.bid
FROM Sailors S
RIGHT JOIN Reserves R ON S.sid = R.sid;
```

SNAME	BID
Dustin	101
Dustin	102
Dustin	103
Dustin	104

Dustin 102

Lubber 103

Lubber 104

Horatio 101

Horatio 102

Horatio 103

8. Full Outer Join

```
SELECT S.sname, R.bid, B.color
FROM Sailors S
FULL OUTER JOIN Reserves R ON S.sid = R.sid
LEFT JOIN Boats B ON R.bid = B.bid;
```

SNAME BID COLOR

--- --- ---

Dustin 101 Blue

Horatio 101 Blue

Dustin 102 Red

Dustin 102 Red

Horatio 102 Red

Dustin 103 Green

Lubber 103 Green

Horatio 103 Green

Dustin 104 Red

Lubber 104 Red

Rusty

SNAME BID COLOR

---------- ---------- ----------

Zorba

Art

Brutus

Bob

Andy

9. Cross Join

SELECT S.sname, B.bname

FROM Sailors S

CROSS JOIN Boats B;

SNAME BNAME

---------- ----------

Dustin Interlake

Brutus Interlake

Lubber	Interlake
Andy	Interlake
Rusty	Interlake
Horatio	Interlake
Zorba	Interlake
Horatio	Interlake
Art	Interlake
Bob	Interlake
Dustin	Interlake

SNAME	BNAME
Brutus	Interlake
Lubber	Interlake
Andy	Interlake
Rusty	Interlake
Horatio	Interlake
Zorba	Interlake
Horatio	Interlake
Art	Interlake
Bob	Interlake

Dustin	Clipper
Brutus	Clipper

SNAME	BNAME
Lubber	Clipper
Andy	Clipper
Rusty	Clipper
Horatio	Clipper
Zorba	Clipper
Horatio	Clipper
Art	Clipper
Bob	Clipper
Dustin	Marine
Brutus	Marine
Lubber	Marine

SNAME	BNAME
Andy	Marine
Rusty	Marine

Horatio	Marine
Zorba	Marine
Horatio	Marine
Art	Marine
Bob	Marine

RESULT

All types of joins — Simple, Non-Equi, Self, Inner (two and three tables), Left, Right, Full Outer, and Cross Join — were implemented successfully on the *Sailors–Boats–Reserves* database.