Experiment 1

1) Creation, altering and dropping of tables and inserting rows into a table (use constraints while Creating tables) examples using SELECT command.

Solution:

```
CREATE TABLE SAILORS
                    ( SID NUMBER(3) PRIMARY KEY,
                    SNAME VARCHAR2(30) ,
                    RATING NUMBER(3),
                    AGE NUMBER(4,2),
                    CHECK ( RATING >=1 AND RATING <=10));
CREATE TABLE BOATS
                    ( BID NUMBER(3) PRIMARY KEY,
                    BNAME VARCHAR2(20),
                    BCOLOR VARCHAR2(20));
CREATE TABLE RESERVES
                    (SID NUMBER(3),
                    BID NUMBER(3),
                    DAY DATE,
                    PRIMARY KEY(SID,BID,DAY),
                    FOREIGN KEY(SID) REFERENCES SAILORS,
                    FOREIGN KEY(BID) REFERENCES BOATS);
```

To see all tables present in your login

```
SELECT * FROM TAB;
```

To see schema of a particular table

```
DESC <TABLENAME>;
```

Show schema of Sailors

```
DESC SAILORS;
```

Show schema of Boats

```
DESC BOATS;
```

Show schema of Reserves

```
DESC RESERVES;
```

Deleting Table: - The table along with its definition & data can be deleted using following command.

```
DROP TABLE <TABLENAME>;
DROP TABLE SAILORS;
```

Adding & Deleting the Attributes and Constraints to the Table :-

To add the attribute to an existing relation we can use ALTER TABLE Command.

```
ALTER TABLE <TABLENAME> ADD COLUMN ATT_NAME DATATYPE;
```

ALTER TABLE SAILORS ADD COLUMN SALARY NUMBER (7,2);

Display schema after modification
DESC SAILORS;

To remove the attribute from an existing relation we can use following Command.

ALTER TABLE <TABLENAME> DROP COLUMN ATT_NAME;

ALTER TABLE SAILORS DROP COLUMN SALARY;

Display schema after modification

DESC SAILORS;

To add the constraint to existing relation we can use ALTER TABLE Command.

ALTER TABLE <TABLENAME> ADD CONSTRAINT
<CON_NAME> <CON_DEFINITION>;

ALTER TABLE SAILORS ADD CONSTRAINT RATE CHECK (RATING >= 1 AND RATING
<=10);
Similarly we can add primary key or foreign key constraint.

To delete the constraint to existing relation we can use following Command.

DROP CONSTRAINT <CON_NAME>;

DROP CONSTRAINT RATE;

Similarly we can drop primary key or foreign key constraint

Data Manipulation Language (DML) Commands:-

Adding data to the Table :- We can add data to table by using INSERT INTO command. While adding the data to the table we must remember the order of attributes as well as their data types as defined while creating table. The syntax is as follows.

INSERT INTO sailors (sid, sname, rating, age) VALUES (22, 'Dustin', 7, 45.0);
INSERT INTO reserves (sid, bid, day) VALUES (22, 101, '1998-10-10');

Insert the below records into sailors, reserves and boats table.

sid	sname	rating	age
22	Dustin	7	45.0
29	Brutus	1	33.0
31	Lubber	8	55.5
32	Andy	8	25.5
58	Rusty	10	35.0
64	Horatio	7	35.0
71	Zorba	10	16.0
74	Horatio	9	35.0
85	Art	3	25.5
95	Bob	3	63.5

Figure 5.1 An Instance 53 of Sailors

sid	bid	day
22	101	10/10/98
22	102	10/10/98
22	103	10/8/98
22	104	10/7/98
31	102	11/10/98
31	103	11/6/98
31	104	11/12/98
64	101	9/5/98
64	102	9/8/98
74	103	9/8/98

Figure 5.2 An Instance *R2* of Reserves

bid	bname	color
101	Interlake	blue
102	Interlake	red
103	Clipper	green
104	Marine	red

Figure 5.3 An Instance *B1* of Boats

To see the records :- To view all records present in the table.
SELECT * FROM <TABLENAME>
SELECT * FROM SAILORS;
To delete the record(s) :- To delete all records from table or a single/multiple records which matches the given condition, we can use DELETE FROM command as follows.
DELETE FROM <TABLENAME> WHERE <CONDITION>;
DELETE FROM SAILORS WHERE SNAME = 'Dustin';
To delete all records from the table
DELETE FROM <TABLENAME>;
DELETE FROM SAILORS;
To change particular value :- We can modify the column values in an existing row using the UPDATE command.
UPDATE <TABLENAME> SET ATT_NAME = NEW_VALUE WHERE CONDITION;
UPDATE SAILORS SET RATING = 9 WHERE SID = 22;
To update all records without any condition.
UPDATE SAILORS SET RATING = RATING + 1;
Examples using SELECT Command
Complete Syntax of SQL Queries consist of six clauses as follows.
SELECT [DISTINCT] <attribute list>

FROM <table list>
[WHERE <condition>]
[GROUP BY <grouping attribute(s)>]
[HAVING <group condition>]
[ORDER BY <attribute list>]
Note – 1) Keywords (UPPERCASE) mentioned in [ ] are optional
2) Text in < > - data need to be provided.
The SELECT-clause lists the attributes or functions to be retrieved
The FROM-clause specifies all relations (or aliases) needed in the query.
The WHERE-clause specifies the conditions for selection and join of tuples from the relations specified in the FROM-clause
GROUP BY specifies grouping attributes
HAVING specifies a condition for selection of groups
ORDER BY specifies an order (sorting) for displaying the result of a query
A query is evaluated by first applying the WHERE-clause, then GROUP BY and HAVING, and finally the SELECT-clause
Examples Using Select Command :
1.Show all records of Sailors
SELECT * FROM SAILORS;
2.Show all records of Boats
SELECT * FROM BOATS;
3.Show all records of Reserves
SELECT * FROM RESERVES;
4.Find the names and ages of all sailors.
SELECT DISTINCT S.SNAME, S.AGE FROM SAILORS;
5.Find all sailors with a rating above 8.
SELECT S.SID, S.SNAME, S.RATING, S.AGE FROM SAILORS S
WHERE S.RATING > 8;
Same query can be written as
SELECT * FROM SAILORS WHERE RATING > 8;
6.Find sailors name with a rating above 7 & age above 25.
SELECT SNAME FROM SAILORS S WHERE S.RATING > 7 AND S.AGE > 25;
7.Display all the names & colors of the boats.
SELECT BNAME, BCOLOR FROM BOATS;
8.Find all the boats with Red color.
SELECT * FROM BOATS WHERE BCOLOR='RED';

9.Find all information of sailors who have reserved boat number 101.
SELECT S.* FROM Sailors S, Reserves R WHERE S.sid = R.sid AND R.bid = 103;

Or without using the range variables, S and R

SELECT Sailors.* FROM Sailors, Reserves WHERE Sailors.sid = Reserves.sid AND Reserves.bid = 103;

10. Find the names of sailors who have reserved at least one boat.
SELECT sname FROM Sailors S, Reserves R WHERE S.sid = R.sid