Experiment-1 **Date:**

ER Diagram for Sailors Database

The goal of the "BoatClub" database is to enable members of a boat club to reserve boats for trips lasting several hours.

The two major entities are:

• Sailors—members of the boat club who reserve boats; and

• Boats—boats in the club's inventory.

In this problem we need to know what boats are reserved by what sailors on a given day. Thus, "reservation" is obviously an important relationship in this simple problem.

Attributes of the Sailor Entity

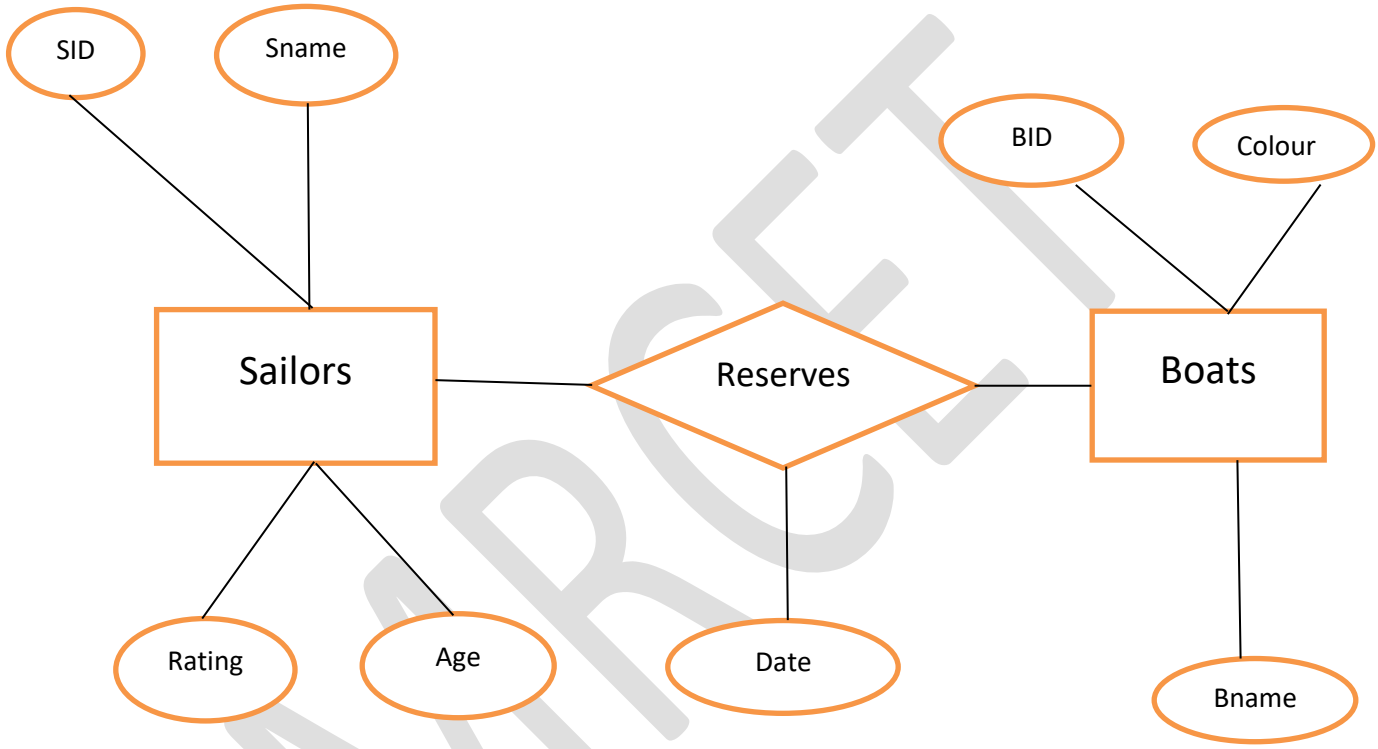
Attribute		Description
SID	-	A sailor—each sailor is assigned a unique ID
name	-	The sailor's name
rating	-	The sailor's rating, ranging from 1 (low) to 10 (high)
age	-	The sailor's age

Attributes of the Boat Entity:

Attribute		Description
BID	-	A boat ID—each boat is assigned a unique ID (painted on the bow)
name	-	The name of the boat (also painted on the bow)
color	-	The color of the boat

A sailor can make many reservations (*) but a reservation involves only a single sailor. Similarly, a boat can be allocated to many reservations, but only one boat is allocated to a particular reservation.

Q1. Draw an ER diagram that captures the above information.



Q2.Convert above ER diagram in to relations (tables)

Sailors:

SID	SNAME	RATING	AGE

Boats:

BID	BNAME	COLOUR

Q3. Write SQL statements to create above relations (tables).

CREATE TABLE SAILORS (SID NUMBER(3) PRIMARY KEY, SNAME VARCHAR2(20),AGE NUMBER(3), RATING NUMBER(2));

CREATE TABLE BOATS (BID NUMBER(3) PRIMARY KEY, BNAME VARCHAR2(20),BCOLOR VARCHAR(10));

CREATE TABLE RESERVES(SID NUMBER(3),BID NUMBER(3),DAY DATE,FOREIGN KEY SID REFERENCES SAILORS(SID),FOREIGN KEY BID REFERENCES BOATS(BID));

Output:

Table created.

Table created.

Table created.

Q4.Insert the following data into above created tables.

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	35
85	Art	3	25.5
95	Bob	3	63.5

Boats

Bid	Bname	Color
101	Interlake	blue
102	Interlake	red
103	Clipper	green
104	Marine	red

Reserves

SID	BID	Day
22	101	10-10-1998
22	102	10-10-1998
22	103	10-08-1998
22	104	10-07-1998
31	102	10-11-1998
31	103	06-11-1998
31	104	11-12-1998
64	101	09-05-1998
64	102	09-08-1998
74	103	09-08-1998

Sailors Data:

INSERT INTO SAILORS VALUES (22,'Dustin',7,45);

```
1 row(s) inserted.
```

INSERT INTO SAILORS VALUES (29,'Brutus',1,33);

```
1 row(s) inserted.
```

INSERT INTO SAILORS VALUES (31,'Lubber',8,55.5);

```
1 row(s) inserted.
```

```
INSERT INTO SAILORS VALUES (32,'Andy',8,25.5);

1 row(s) inserted.
INSERT INTO SAILORS VALUES (58,'Rusty',10,35);

1 row(s) inserted.
INSERT INTO SAILORS VALUES (64,'Horatio',7,35);

1 row(s) inserted.
INSERT INTO SAILORS VALUES (71,'Zorba',10,16);

1 row(s) inserted.
INSERT INTO SAILORS VALUES (74,'Horatio',9,35);

1 row(s) inserted.
INSERT INTO SAILORS VALUES (85,'Art',3,25.5);

1 row(s) inserted.
INSERT INTO SAILORS VALUES (95,'Bob',3,63.5);

1 row(s) inserted.
```

Boats Data:

```
Insert into Boats values (101,'Interlake','blue');

1 row(s)  inserted.

Insert into Boats values (102,'Interlake','red');

1 row(s) inserted.
Insert into Boats values (103,'Clipper','green');

1 row(s) inserted.
Insert into Boats values (104,'Marine','red');

1 row(s) inserted.
```

Reserves Data:

```
insert into Reserves values(22,101,'1998-10-10');

1 row(s) inserted.
insert into Reserves values(22,102,'1998-10-10');

1 row(s) inserted.
insert into Reserves values(22,103,'1998-08-10');

1 row(s) inserted.
insert into Reserves values(22,104,'1998-07-10');

1 row(s) inserted.
insert into Reserves values(31,102,'1998-11-10');
```

```
1 row(s) inserted.
```
insert into Reserves values(31,103,'1998-11-10');

```
1 row(s) inserted.
```
insert into Reserves values(31,104,'1998-12-11');

```
1 row(s) inserted.
```
insert into Reserves values(64,101,'1998-05-09');

```
1 row(s) inserted.
```
insert into Reserves values(64,102,'1998-08-09');

```
1 row(s) inserted.
```
SELECT * FROM SAILORS;

SELECT * FROM BOATS;

SELECT * FROM RESERVES;

Output:

SID	SNAME	RATING	AGE
22	Dustin	7	45
29	Brutus	1	33
31	Lubber	8	56
32	Andy	8	26
58	Rusty	10	35
64	Horatio	7	35
71	Zorba	10	16
74	Horatio	9	35
85	Art	3	26
95	Bob	3	64

10 rows returned in 0.00 seconds

BID	BNAME	BCOLOR
101	Interlake	blue
102	Interlake	red
103	Clipper	green
104	Marine	red

4 rows returned in 0.00 seconds

SID	BID	DAY
22	101	10-OCT-98
22	102	10-OCT-98
22	103	10-AUG-98
22	104	10-JUL-98
31	102	10-NOV-98
31	103	06-NOV-98
31	104	11-DEC-98
64	102	09-AUG-98
74	103	09-MAY-98
64	101	09-MAY-98

10 rows returned in 0.00 seconds

Q5.Write the following Queries in SQL.

5.1 Find the names and ages of all sailors.

SELECT SNAME, AGE FROM SAILORS;

Output:

SNAME	AGE
Dustin	45
Brutus	33
Lubber	56
Andy	26
Rusty	35
Horatio	35
Zorba	16
Horatio	35
Art	26
Bob	64

10 rows returned in 0.00 seconds

5.2 Find all sailors with a rating above 7.

SELECT * FROM SAILORS WHERE RATING > 7;

Output:

SID	SNAME	RATING	AGE
31	Lubber	8	56
32	Andy	8	26
58	Rusty	10	35
71	Zorba	10	16
74	Horatio	9	35

5 rows returned in 0.00 seconds

5.3Find the names of sailors who have reserved boat number 103.

SELECT SNAME FROM SAILORS , RESERVES WHERE SAILORS.SID = RESERVES.SID AND RESERVES.BID = 103;

Output:

SNAME
Dustin
Lubber
Horatio

3 rows returned i

5.4 Find the sids of sailors who have reserved a red boat.

SELECT S.SID FROM SAILORS S,RESERVES R,BOATS B WHERE S.SID = R.SID AND B.BID = R.BID AND B.BCOLOR = 'red';

Output:

SID
22
22
31
31
64

5.5 Find the names of sailors who have reserved a red boat.

SELECT S.SNAME FROM SAILORS S,RESERVES R,BOATS B WHERE S.SID = R.SID AND B.BID = R.BID AND B.BCOLOR = 'red';

Output:

SNAME
Dustin
Dustin
Lubber
Lubber
Horatio

5.6. Find the colors of boats reserved by Lubber.

SELECT B.BCOLOR FROM BOATS B,RESERVES R,SAILORS S WHERE S.SID = R.SID AND R.BID = B.BID AND S.SNAME = 'Lubber';

Output:

BCOLOR
red
green
red

5.7.Find the names of sailors who have reserved at least one boat.

SELECT S.SNAME FROM SAILORS S,RESERVES R,BOATS B WHERE S.SID = R.SID AND B.BID = R.BID;

Output:

SNAME
Dustin
Dustin
Dustin
Dustin
Lubber
Lubber
Lubber
Horatio
Horatio
Horatio

10 rows returned in 0.00 seconds

5.8 Compute increments for the ratings of persons who have sailed two different boats on the same day.

SELECT S.SNAME,S.RATING+1 AS RATING FROM SAILORS S, RESERVES R1,RESERVES R2 WHERE

S.SID = R1.SID AND R1.SID = R2.SID AND R1.BID!=R2.BID AND R1.DAY = R2.DAY;

Output:

SNAME	RATING
Dustin	7
Dustin	7

2 rows returned in 0.00 seconds

5.9.Find the ages of sailors whose names begins and ends with the B and has at least three characters.

SELECT * FROM SAILORS WHERE SNAME LIKE 'B_%b';

Output:

SID	SNAME	RATING	AGE
95	Bob	3	64

1 rows returned in 0.00 seconds

Experiment-2 **Date :**

Creation, Altering and Dropping of Tables and Inserting Rows into a Table (Use Constraints While Creating Tables) Examples Using Select Command.

Examples Using Select Command.

Q.1: Login into Oracle data base using ***system*** user and create a user with your ***Roll no*** and grant permission to create the tables in SQL.
Ans: Create user <username> identified by <password>
Grant dba to <username>

Q.2 Login into oracle data base using your roll no and create the following tables.

1. Sailors (sid:integer)
2. Boats (bid:integer);
3. Reserves (sid:integer,bid:integer,day:date);

Ans:

```
create table Sailors_demo(sid int(10));

create table Boats_demo(bid int(10));

create table Reserves_demo(sid int(10),bid int(10),day date);
```

Write the following DQL statements.

1. Add new column sailor name and rating to sailors table.

```
ALTER TABLE SAILORS_DEMO ADD(SNAME VARCHAR2(20),RATING NUMBER(2));
```

Output:

Table Altered.

2. Add new column boat name and color to Boats table.

```
ALTER TABLE BOATS_DEMO ADD (BNAME  VARCHAR2(20),BCOLOR VARCHAR(10));
```

Output:

Table Altered.

3. Add a primary key to sailors table after table creation

```
ALTER TABLE SAILORS_DEMO ADD CONSTRAINT SID_PK PRIMARY KEY(SID);
```

Output:

Table Altered.

4. Add a primary key to Boats table after table creation

```
ALTER TABLE BOATS_DEMO ADD CONSTRAINT BID_PK PRIMARY KEY(BID);
```

Output:

Table Altered.

5. Remove a Primary Key from Sailors table

```
ALTER TABLE SAILORS_DEMO DROP CONSTRAINT SID_PK;
```

Output:

Table dropped.

6. Remove a Primary Key from Boats table

```
ALTER TABLE BOATS_DEMO DROP CONSTRAINT BID_PK;
```

Output:

Table dropped.

7. Add a not null constrain on Sailors, Boats Table

```
ALTER TABLE SAILORS_DEMO MODIFY SNAME VARCHAR(20) NOT NULL;

ALTER TABLE BOATS_DEMO MODIFY BNAME VARCHAR(20) NOT NULL;
```

Output:

Table Altered.

8. Drop not null constraints from Sailors, Boats Table.

```
ALTER TABLE SAILORS_DEMO MODIFY SNAME VARCHAR(20) NULL;

ALTER TABLE BOATS_DEMO MODIFY BNAME VARCHAR2(20) NULL;
```

Output:

Table Altered.

9. Add a constraint check to the rating column

ALTER TABLE SAILORS ADD CONSTRAINT CHECK_RATING CHECK(RATING>=1 AND RATING <=10);

Output:

Table Altered.

10. Drop the above check constraint from rating column.

ALTER TABLE SAILORS DROP CONSTRAINT CHECK_RATING;

Output:

Table Dropped.

11. Add a primary key constraint on Sailors, Boats tables.

ALTER TABLE SAILORS_DEMO ADD CONSTRAINT SID_PK PRIMARY KEY(SID);

ALTER TABLE BOATS_DEMO ADD CONSTRAINT BID_PK PRIMARY KEY(BID);

Output:

Table Altered.

12. Drop primary key constraints from sailors ,Boats tables.

ALTER TABLE SAILORS_DEMO DROP CONSTRAINT SID_PK;

ALTER TABLE BOATS_DEMO DROP CONSTRAINT BID_PK;

Output:

Table dropped

13. Add foreign key constraints to reserves table.

ALTER TABLE RESERVES_DEMO ADD CONSTRAINT SID_FK FOREIGN KEY(SID) REFERENCES SAILORS_DEMO(SID);

ALTER TABLE RESERVES_DEMO ADD CONSTRAINT BID_FK FOREIGN KEY(BID) REFERENCES BOATS_DEMO(BID);

Output:

Table Altered.

14. Drop foreign key constraints from reserve table

ALTER TABLE RESERVES_DEMO DROP CONSTRAINT SID_FK;

ALTER TABLE RESERVES_DEMO DROP CONSTRAINT BID_FK;

Output:

Table dropped.