DB Fall 2018

Min Joon So

Part 1.

1. select distinct b.bname, s.sname, count() from boats b join reserves r on b.bid=r.bid join sailors s on s.sid=r.sid group by b.bid, b.bname, s.sid, s.sname having count() >= ALL (select count(*) from reserves r0 where r0.bid = b.bid group by r0.sid) order by b.bname, s.sname

```
mysql> select distinct b.bname, s.sname, count(*) from boats b join reserves r1 on b.bid=r1.bid join
sailors s on s.sid=r1.sid group by b.bid, b.bname, s.sid, s.sname having count(*) >= ALL (select coun
t(*) from reserves r2 where r2.bid = b.bid group by r2.sid) order by b.bname, s.sname;
+-----------+----------+----------+
| bname     | sname    | count(*) |
+-----------+----------+----------+
| Clipper   | dusting  |        1 |
| Clipper   | emilio   |        1 |
| Clipper   | figaro   |        1 |
| Clipper   | horatio  |        1 |
| Clipper   | lubber   |        1 |
| Clipper   | scruntus |        1 |
| Driftwood | dye      |        1 |
| Driftwood | jit      |        1 |
| Driftwood | stum     |        1 |
| Driftwood | vin      |        1 |
| Interlake | dusting  |        1 |
| Interlake | horatio  |        1 |
| Interlake | lubber   |        1 |
| Klapser   | dan      |        2 |
| Marine    | dan      |        1 |
| Marine    | emilio   |        1 |
| Marine    | figaro   |        1 |
| Marine    | jit      |        2 |
| Marine    | stum     |        1 |
| Sooney    | dan      |        1 |
| Sooney    | ossola   |        1 |
+-----------+----------+----------+
21 rows in set (0.00 sec)
```

2. select bid, bname, count(*) as c from (select * from reserves left join boats using(bid)) as result where not bid=0 group by bid;

```
ysql> select bid, bname, count(*) as c from (select * from reserves left join boats using(bid)) as
k where not bid=0 group by bid;
+-----+-----------+---+
| bid | bname     | c |
+-----+-----------+---+
| 101 | Interlake | 2 |
| 102 | Interlake | 3 |
| 103 | Clipper   | 3 |
| 104 | Clipper   | 5 |
| 105 | Marine    | 3 |
| 106 | Marine    | 3 |
| 107 | Marine    | 1 |
| 108 | Driftwood | 1 |
| 109 | Driftwood | 4 |
| 110 | Klapser   | 3 |
| 111 | Sooney    | 1 |
| 112 | Sooney    | 1 |
+-----+-----------+---+
12 rows in set (0.00 sec)
```

3. select s.sname from sailors s where s.sid in (select r.sid from reserves r where r.bid = all(select b.bid from boats b where b.color = 'red'));

```
mysql> select s.sname from sailors s where s.sid in (select r.sid from reserves r where r.bid = all(s
elect b.bid from boats b where b.color = 'red'));
Empty set (0.00 sec)
```

4. select * from sailors s where s.sid in(select distinct r.sid from reserves r where r.sid not in (select distinct r.sid from reserves r left join boats b on r.bid = b.bid where b.color !='red'));

```
mysql> select * from sailors s where s.sid in(select distinct r.sid from reserves r where r.sid not
n (select distinct r.sid from reserves r left join boats b on r.bid = b.bid where b.color !='red'));
+-----+----------+--------+------+
| sid | sname    | rating | age  |
+-----+----------+--------+------+
|  23 | emilio   |      7 |   45 |
|  24 | scruntus |      1 |   33 |
|  35 | figaro   |      8 |   56 |
|  61 | ossola   |      7 |   16 |
|  62 | shaun    |     10 |   35 |
+-----+----------+--------+------+
5 rows in set (0.00 sec)
```

5. select bid, result.c from (select bid, count(*) as c from reserves group by bid order by c desc limit 1) as result;

```
mysql> select bid, result.c from (select bid, count(*) as c from reserves group by bid order by c des
c limit 1) as result;
+-----+---+
| bid | c |
+-----+---+
| 104 | 5 |
+-----+---+
1 row in set (0.00 sec)
```

6. select s.sname from sailors s where s.sid not in (select r.sid from reserves r where r.bid in (select b.bid from boats b where b.color = “red”));

```
mysql> select s.sname from sailors s where s.sid not in (select r.sid from reserves r where r.bid in
(select b.bid from boats b where b.color = "red"));
+---------+
| sname   |
+---------+
| brutus  |
| andy    |
| rusty   |
| jit     |
| zorba   |
| horatio |
| art     |
| vin     |
| bob     |
+---------+
```

7. select avg (s.age) from sailors s where s.rating = 10;

```
mysql> select avg (s.age) from sailors s where s.rating = 10;
+--------------+
| avg (s.age) |
+--------------+
|      35.0000 |
+--------------+
1 row in set (0.01 sec)
```

Part 2.

See the code attached

- Base.py

I used sqlalchemy to implement ORM and implemented the exact same queries from part 1. How I wrote tests is I used assert to compare two results: one from engine.execute(<mysql query>) which returns basically a list of tuples, each tuple being a row. The other result I am comparing to is queries I got from using sqlalchemy ORM using session.query(). Since they are instances of their own object classes, I loaded the contents (tuples) into two lists and compare the lists if they are the same.

Part 3.

See the code attached

- p3.py
- sailors2.sql

Repair Tracker

There should be a way to figure out which boats need to be repaired. So I implemented a repair tracker in which a python function retrieves data from the database where 'wear' column has over integer value 80%. The column represents from 0 to 100%, how much a boat is worn out.

Monthly Account

There should be a way to sum up how much money should each sailor pay each month so that by the end of each month, the owner of the shop can easily calculate how much each person owes. This function reports how much each sailor should pay depending on (1) how many days a sailor is borrowing a boat(s) and (2) boat rent fee per day. The result is the product of column (1) and (2). (1) is calculated by retrieving 'start_d' column and 'return_d' column, and calculating the difference in days. If a sailor borrows more than one boat, the values are summed up at the time of query.

Rent Today

It is difficult to find out, without querying the database, who lends which boat today. For the convenience of employees at the shop when preparing boats each day to lend, Today(today's date) function was implemented to return sailors and corresponding boats that the sailors are borrowing today.

Pay salary

A new table called 'employees' is created and there exist five employees working at the shop. Each employee has the following attributes: eid, ename, salary, employment_duration. Also each boat has an attribute (column) called 'eid' which represents the employee in charge of managing each boat. Depending the number of boats each employee manages and monthly salary rate of the employee, the total salary is calculated for the month.