CSEN 178: Introduction to Database Systems– Winter 2025

Lab 5: Structured Query Language (SQL) (100 points)

Due Date: **Tuesday, Feb 25th (23:59 PM)**

Submission

All lab assignments should contain both your student ID and your name and must be submitted online (e.g., 12345678_John_Doe.pdf) via Gradescope. **Also,** submit a zipped file(12345678_John_Doe.zip) of your sql queries via Camino. Within the zip file, number your sql files with their appropriate number (i.e., Question_1.sql, Question_2.sql, ...). Check the timetable below for the Lab5 deadlines. Note that after 23:59 PM on Wednesday the 26th no further submissions will be accepted since we will be releasing the solution at that time. Please strive to get all your work in on time! If possible,try to keep saving your one dropped assignment for later in the term.

Date / Time	Grade Implications
Tuesday, Feb 25th (23:59 PM)	Full credit will be available
Wednesday, Feb 26th (23:59 PM)	10% will be deducted

Structured Query Language (SQL) [100 pts]

Congratulations! PHLog.com is happy with your database design work and the expertise that you've demonstrated based on relational algebra and calculus. Now it's time to get real – it's time to use MySQL and its implementation of the SQLquery language to write a number of queries that they envision needing for their planned applications.

Schema, Data, and Tools

PHLog.com is happy using the relations resulting from Lab #2. You can refer to the provided solution to remind yourself of their schemas. You will also be able to see the relations' schemas in MySQL Workbench when you are using it for this assignment. A new sample data set will be provided for you to use in testing your queries. We've increased the length of some varchar fields, so please drop your old schema and load the dataset using the provided script. More information about how to load the schema and associated sample data – and how to

enter and run queries – can be found in the instructions linked fromLab #5's entry on Camino. **You are to use MySQL for all of the queries in this assignment and turn in the queries and results based on the provided template.**

Write the following queries in SQL against the PHLog.com test relations. Show the result of each query that you wrote where requested to do so. Please note that you will not get points for providing the result of a query on this assignment if your SQL query is syntactically incorrect (i.e., if it doesn't execute). Since you have a "live" system at your disposal, this should not be an issue – you will be able to run all of your queries that way. **Make sure that the result of your queries do not contain duplicate records, as you will lose points for that.** (For some problems, you may find one or more of the following hints helpful: (i) Given two date or time values, you can use the timediff(val2, val1) function to calculate the duration between them. (ii) To limit the number of results returned by a query, you can use the LIMIT clause in SQL. (iii)You can put a subquery in the FROM clause of a query and then treat it (in the outer query) as though it were a stored table.)To help you assess the correctness of your answers we have provided you with the number of result rows expected for each query.

Last Name: Miri First Name: Arman Student ID: 07700006039

[12.5pts] Find the kind and model of observers of type (kind) camera with their software version being 1.9.

[9pts] SQL Query:

```sql
SELECT kind, model
FROM Observer
WHERE kind = 'camera'
  AND software_version = '1.9';
```

[3.5pts] Result: (2 Rows)

```
[➜  Lab 5 mysql -u root -p csen178_w25 < Question_1.sql
[Enter password:
kind    model
camera  Model 4
camera  Model 1
```

[12.5pts] List the name and email of all PHLoggers who have posted a thought about an interest group they are part of which has the topic of ‘exercise’.

[9pts] SQL Query:

```sql
SELECT DISTINCT ph.name, u.email
FROM PHLogger ph, User u, Thought th, About ab, Interest i, Member m
WHERE ph.phlid = u.phlid
  AND ph.phlid = th.phlid
  AND th.phlid = ab.phlid
  AND ab.iname = i.iname
  AND ph.phlid = m.phlid
  AND i.iname = m.iname
  AND i.topic = 'exercise';
```

[3.5pts] Result: (4 Rows)

```
➜  Lab 5 mysql -u root -p csen178_w25 < Question_2.sql
Enter password:
name    email
Merilyn Dickens merilyn.dickens@scu.com
Venus Lueilwitz venus.lueilwitz@scu.com
Charlena Rath   charlena.rath@scu.com
Mac Maggio      mac.maggio@scu.com
```

[12.5pts] Find the name of PHLoggers who member of more than 4 interest groups are. Use subquery.
[9pts] SQL Query:

```sql
SELECT name
FROM PHLogger
WHERE phlid IN (
  SELECT phlid
  FROM Member
  GROUP BY phlid
  HAVING COUNT(*) > 4
);
```

[3.5pts] Result: (3 Rows)

```
➜  Lab 5 mysql -u root -p csen178_w25 < Question_3.sql
Enter password:
name
Michell Sipes
Camellia Hoeger
Dallas Boehm
```

[12.5pts] For all observers of kind ‘smartwatch’ that have reported blood pressure observations with the lowest value of diastolic, list their model and their manufacturer.

[9pts] SQL Query:

```sql
SELECT DISTINCT o.model, o.manufacturer
FROM Observer o, Observable ob
WHERE o.observer_id = ob.observer_id
  AND o.kind = 'smartwatch'
  AND ob.kind = 'bloodpressure'
  AND ob.diastolic = (
    SELECT MIN(diastolic)
    FROM Observable
    WHERE kind = 'bloodpressure'
  );
```

[3.5pts] Result: (2 Rows)

```
➜  Lab 5 mysql -u root -p csen178_w25 < Question_4.sql
Enter password:
model   manufacturer
Model 2 Microsoft
Model 8 Apple
```

[12.5pts] List all information about the PHLoggers who are a member of interest group that contains the word `exercise` and also have made a PHLG observation that contains the word 'jet skiing' indicating an event of name 'camping'. Use intersection.

[9pts] SQL Query:

```sql
SELECT *
FROM PHLogger p
WHERE p.phlid IN (
    SELECT m.phlid
    FROM Member m, Interest i
    WHERE m.iname = i.iname
        AND i.topic LIKE '%exercise%'
)
AND p.phlid IN (
    SELECT obs.phlid
    FROM Observation obs, PHLG_obs pobs, Event e
    WHERE obs.observation_id = pobs.observation_id
        AND pobs.text LIKE '%jet skiing%'
        AND obs.phlid = e.phlid
        AND e.ename = 'camping'
);
```

[3.5pts] Result: (1 Row)

phlid	name	address_street	address_city	address_state	address_pcode
37	Connie Kirlin	Grant Ferry	North Benitaville	CA	32816-5956

[12.5pts] For each event name containing the word "ball" that has been recorded in more than 3 observations, find the event name along with the number of observations associated with it.
[9pts] SQL Query:

```sql
SELECT e.ename, COUNT(i.observation_id) AS obs_count
FROM Event e, Indicate i
WHERE e.eid = i.eid
  AND e.ename LIKE '%ball%'
GROUP BY e.ename
HAVING COUNT(i.observation_id) > 3;
```

[3.5pts] Result: (3 Rows)

```
→  Lab 5 mysql -u root -p csen178_w25 < Question_6.sql
Enter password:
ename   obs_count
volleyball      6
baseball        5
football        4
```

[12.5pts] Find the eid and ename of Events that that have lasted longer than 45 minutes and are associated with more than 3 Observations. (Hint: use TIMEDIFF())

[9pts] SQL Query:

```sql
SELECT e.eid, e.ename
FROM Event e, Indicate i
WHERE e.eid = i.eid
    AND TIMEDIFF(e.end, e.start) > '00:45:00'
GROUP BY e.eid, e.ename
HAVING COUNT(i.observation_id) > 3;
```

[3.5pts] Result: (6 Rows)

```
[→  Lab 5 mysql -u root -p csen178_w25 < Question_7.sql
[Enter password:
eid     ename
151     bicycling
2       jet skiing
48      jet skiing
62      meditating
69      meeting
80      rafting
```

[12.5pts] For Users who have a blood pressure observation with diastolic value more than 97 and systolic value more than 196 and a heart rate observation that was made at the same time, list the users phlid, diastolic, systolic, rate and the time when the observations were made (i.e., started).

[9pts] SQL Query:

```sql
SELECT DISTINCT o1.phlid,
    bp.diastolic,
    bp.systolic,
    hr.rate,
    o1.start AS observation_start
FROM Observation o1, Observable bp, Observation o2, Observable hr
WHERE o1.observation_id = bp.observation_id
    AND bp.kind = 'bloodpressure'
    AND bp.diastolic > 97
    AND bp.systolic > 196
    AND o2.observation_id = hr.observation_id
    AND hr.kind = 'heartrate'
    AND o1.phlid = o2.phlid
    AND o1.start = o2.start;
```

[2pts] Result: (13 Rows)

phlid	diastolic	systolic	rate	observation_start
100	119	198	60	2019-03-01 04:00:00
58	109	198	84	2019-03-02 00:30:00
72	113	197	99	2019-03-04 10:00:00
88	102	198	87	2019-03-07 00:30:00
53	101	198	67	2019-03-11 06:30:00
41	106	199	96	2019-03-13 02:00:00
59	108	197	79	2019-03-14 14:30:00
113	135	198	66	2019-03-17 01:30:00
35	119	199	72	2019-03-17 05:30:00
118	120	198	63	2019-03-18 11:00:00
15	133	198	64	2019-03-19 12:00:00
97	109	199	63	2019-03-20 14:30:00
80	130	197	71	2019-03-21 14:30:00

[1.5 points] Q: Could the same user (the same phlid) appear multiple times in the result?

Yes, the same user can appear multiple times if they have multiple observations at different times that meet the criteria of the systolic and diastolic pressures.