Name: Zongcheng Du (Leonard Du)
Username: zongchengd
StudentID: 1096319

INFO90002 Assessment2

Q1.Print each user's name, along with the number of times they have recorded a location.

```
SELECT User.name, COUNT(Location.user) AS numRecorded
FROM User LEFT OUTER JOIN Location
ON User.id = Location.user
GROUP BY User.name;
```

name	numRecorded
Alice	28
Bob	32
Carol	26
Dave	20
Eve	22
Fred	0
Grace	22

7 Rows Returned

Q2.How many cities are in the same state as Melbourne? (Don't count Melbourne in your answer.)

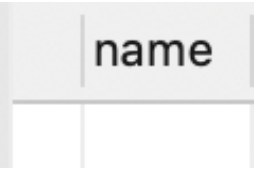
```
SELECT COUNT(*) AS num
FROM City
WHERE state =
        (SELECT state
        From City
        WHERE cityName = 'Melbourne')
AND cityName <> 'Melbourne';
```

num
1

1Row Returned

Q3.List the names of any members of Academia gym who have been north of Brunswick gym.

```
SELECT DISTINCT User.name
FROM User INNER JOIN Location INNER JOIN Gym
ON User.id = Location.user
AND User.gym =
        (SELECT Gym.id
        FROM Gym
        WHERE Gym.name = 'Academia')
WHERE Location.latitude >
        (SELECT Gym.latitude
        FROM Gym
        WHERE Gym.name = ‘Brunswick');
```

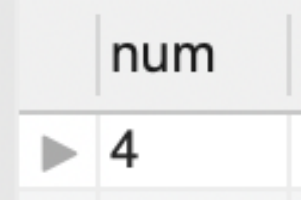


name

0 Row Returned

Q4.How many users are registered with gyms in the state of Vic?

```
SELECT COUNT(*) AS num
FROM User INNER JOIN Gym INNER JOIN City
ON User.gym = Gym.id AND Gym.city = City.id
WHERE City.state = 'Vic';
```

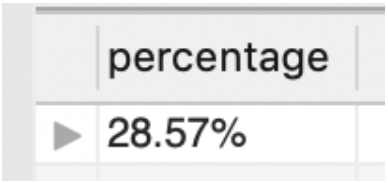


num
4

1 Row Returned

Q5.What percentage of the total number of users are not affiliated with gyms?

```
SELECT CONCAT(FORMAT(
        (SELECT COUNT(id)
        FROM User
        WHERE gym IS NULL) /
        (SELECT COUNT(id)
        FROM User) * 100, 2), '%') AS percentage;
```

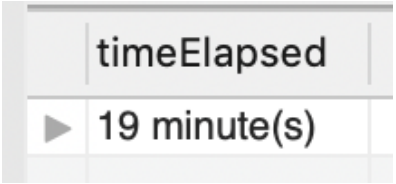


percentage
28.57%

1 Row Returned

Q6.How much time elapsed between the first and last recorded locations of the user with id 4?

```
SELECT CONCAT(TIMESTAMPDIFF(MINUTE,
        (SELECT MIN(whenRecorded)
        FROM Location
        WHERE user = 4),
        (SELECT MAX(whenRecorded)
        FROM Location
        WHERE user = 4)),' minute(s)') AS timeElapsed;
```



timeElapsed
19 minute(s)

1 Row Returned

Q7.Print as two columns: the average number of locations recorded by registered users, and the average number of locations recorded by unregistered users.

```
SELECT (SELECT FORMAT(AVG(num),2)
        FROM (SELECT COUNT(Location.user) AS num
              FROM User LEFT OUTER JOIN Location
              ON User.id = Location.user
              WHERE User.gym IS NOT NULL
              GROUP BY User.name, User.gym) AS RegTable) AS RegisteredAvg,
       (SELECT FORMAT(AVG(num),2)
        FROM (SELECT COUNT(Location.user) AS num
              FROM User LEFT OUTER JOIN Location
              ON User.id = Location.user
              WHERE User.gym IS NULL
              GROUP BY User.name, User.gym) AS UnregTable) AS UnregisteredAvg;
```

RegisteredAvg	UnregisteredAvg
25.60	11.00

1 Row Returned

Q8.List the names of users who have run within 100m of the Doug McDonell building. (DMD is at longitude 144.9630, latitude -37.7990 .)

```
SELECT DISTINCT name
FROM User INNER JOIN Location
ON User.id = Location.user
WHERE SQRT(POWER(Location.longitude - 144.9630, 2) +
      POWER(Location.latitude - (-37.7990), 2)) * 100 <= 0.1;
```

name
Alice

1 Row Returned

Q9.What is the distance between the northern-most and southern-most locations to which Alice has run?

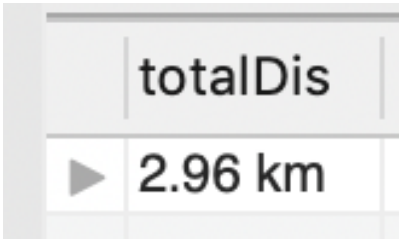
```
SELECT CONCAT(FORMAT(MAX(SQRT
        (POWER(North.longitude - South.longitude, 2) +
        POWER(North.latitude - South.latitude, 2)) * 100 * 1000),2), ' m')
        AS distance
FROM (SELECT longitude, latitude
        FROM Location
        WHERE latitude =
                (SELECT MAX(latitude)
                FROM Location
                WHERE Location.user =
                        (SELECT User.id
                        FROM User
                        WHERE User.name = 'Alice'))) AS North CROSS JOIN
        (SELECT longitude, latitude
        FROM Location
        WHERE latitude =
                (SELECT MIN(latitude)
                 FROM Location
                WHERE Location.user =
                        (SELECT User.id
                        FROM User
                        WHERE User.name = 'Alice'))) AS South;
```

distance
904.27 m

1 Row Returned

Q10.Show the total distance that Alice has run. Calculate this by summing the individual distances between each successive pair of locations.

```
SELECT CONCAT(FORMAT(SUM(SQRT
        (POWER(EndPostion.longitude - StartPostion.longitude, 2) +
        POWER(EndPostion.latitude - StartPostion.latitude, 2)) * 100),2), ' km') AS totalDis
FROM (SELECT longitude, latitude, whenRecorded
        FROM Location
        WHERE Location.user =
                (SELECT id
                FROM User
                WHERE User.name = 'Alice')) AS StartPostion JOIN
   (SELECT longitude, latitude, whenRecorded
        FROM Location
        WHERE Location.user =
                (SELECT id
                FROM User
                WHERE User.name = 'Alice')) AS EndPostion
WHERE TIMESTAMPDIFF(MINUTE,
        StartPostion.whenRecorded, EndPostion.whenRecorded) = 1;
```



1 Row Returned