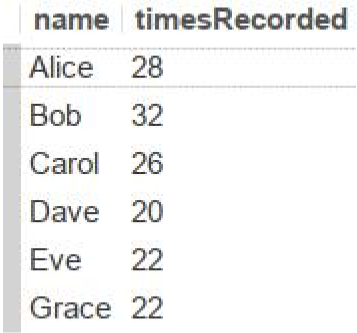
Assignment 2

Name: Hongzhi Fu

Student Number:1058170

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

```
SELECT name, COUNT(*) AS timesRecorded
FROM User INNER JOIN Location
ON User.id = Location.user
GROUP BY Location.user;
```

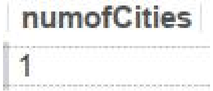


name	timesRecorded
Alice	28
Bob	32
Carol	26
Dave	20
Eve	22
Grace	22

6 Rows Returned

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

```
SELECT COUNT(*) AS numofCities
FROM City AS C1
WHERE C1.cityName != 'Melbourne'
AND C1.state =
        (SELECT state
         FROM City AS C2
         WHERE C2.cityName = 'Melbourne');
```

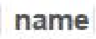


numofCities
1

1 Row Returned

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

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

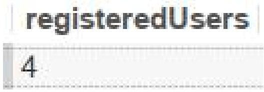


name

0 Rows Returned

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

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

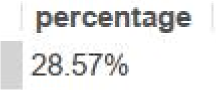


registeredUsers
4

1 Row Returned

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

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

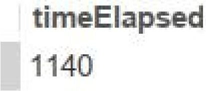


percentage
28.57%

1 Row Returned

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

```
SELECT TIMESTAMPDIFF(second, MIN(whenRecorded), MAX(whenRecorded))
AS timeElapsed
FROM Location
WHERE user = 4;
```



timeElapsed
1140

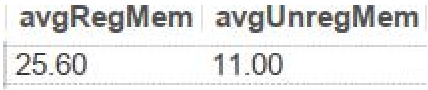
Note: The unit of time here is second.

1 Row Returned

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

```
SELECT ROUND(COUNT(*) /
        (SELECT COUNT(*)
         FROM User
         WHERE User.gym IS NOT NULL), 2)
AS avgRegMem,
ROUND((((SELECT COUNT(*)
            FROM Location) - COUNT(*)) /
                (SELECT COUNT(*)
                 FROM User
                 WHERE User.gym IS NULL)), 2)
AS avgUnregMem
```

```
FROM Location
WHERE Location.user IN
        (SELECT User.id
         FROM User
         WHERE User.gym IS NOT NULL);
```

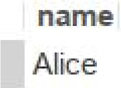


avgRegMem	avgUnregMem
25.60	11.00

1 Row Returned

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

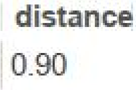


name
Alice

1 Row Returned

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

```
SELECT ROUND(MAX(SQRT(POW(L1.latitude - L2.latitude, 2) + POW(L1.longitude -
L2.longitude, 2)) * 100), 2) AS distance
FROM User INNER JOIN Location L1 INNER JOIN Location L2
ON User.id = L1.user and User.id = L2.user
WHERE User.name = 'Alice'
AND L1.latitude =
        (SELECT MAX(Location.latitude)
         FROM Location INNER JOIN User
         ON Location.user = User.id
         WHERE User.name = 'Alice')
AND L2.latitude =
        (SELECT MIN(Location.latitude)
         FROM Location INNER JOIN User
         ON Location.user = User.id
         WHERE User.name = 'Alice');
```



distance
0.90

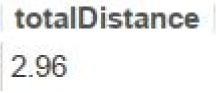
Note: The maximum distance between northern-most and southern-most locations is selected in the result.

1 Row Returned

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

```
SELECT ROUND(SUM(SQRT(POW(L1.latitude - L2.latitude, 2) + POW(L1.longitude -
L2.longitude, 2)) * 100), 2) AS totalDistance
```

```
FROM User INNER JOIN Location L1 INNER JOIN Location L2
ON User.id = L1.user and User.id = L2.user and L2.id - L1.id = 2
WHERE User.name = 'Alice';
```



totalDistance
2.96

1 Row Returned

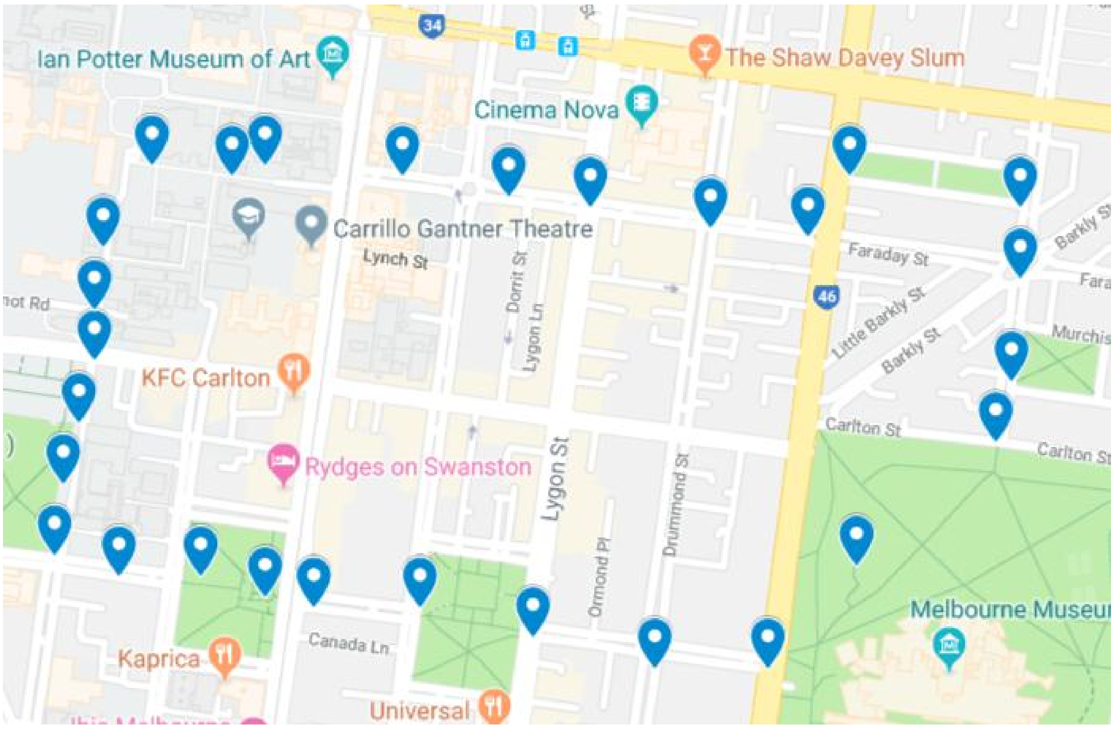


Figure 1 The total distance that Alice has run