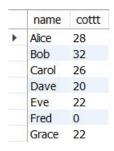# DataBase Assignment2   YuWei Tsai 1071545

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

   SELECT User.name, COUNT(Location.user) AS cottt

   FROM User

   LEFT JOIN Location on User.id=Location.user

   GROUP BY User.name

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

   7 Rows Returned

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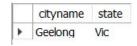
   SELECT cityname, state

   FROM City

   WHERE state =(SELECT state FROM City

   　　　　　　WHERE cityName='Melbourne')

   AND cityName != 'Melbourne'

cityname	state
Geelong	Vic

   1 Rows Returned, Ans: 1 city

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

SELECT User.name, latitude

FROM Location

LEFT JOIN User ON Location.user = User.id

WHERE Location.latitude >

        (SELECT Gym.latitude

        FROM Gym

        WHERE Gym.name = 'Brunswick')

AND User.gym = 'Academia'

name	latitude

0 Rows Returned, Ans: no one

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

SELECT COUNT(*) FROM User

LEFT JOIN (SELECT Gym.id, Gym.name, City.state

        FROM Gym

        LEFT JOIN City ON Gym.city = City.id

        WHERE City.state = 'Vic') AS Gym

ON User.gym = Gym.id

WHERE Gym.state = 'Vic'

COUNT(*)
4

1 Rows Returned, Ans: 4 users

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

SELECT FORMAT(((SELECT COUNT(*) FROM User WHERE User.gym is null)

/ (SELECT COUNT(*) FROM User))*100,2) AS PERCENTAGE

PERCENTAGE
28.57

1 Rows Returned, Ans: 28.57%

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

SELECT TIMESTAMPDIFF(MINUTE, Min(Location.whenRecorded), Max(Location.whenRecorded)) AS timeElapsed

FROM Location

WHERE Location.user =　4

timeElapsed
19

1 Rows Returned, Ans: 19

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 FORMAT(AVG(regUser.NumOfRec),2), FORMAT(AVG(UnregUser.NumOfRec),2)

FROM(

    SELECT Location.user, COUNT(Location.whenRecorded) AS NumOfRec

    FROM Location

    WHERE Location.user IN (SELECT User.id FROM User WHERE User.gym IS NOT null)

    GROUP BY Location.user

) AS regUser , (

    SELECT User.name, COUNT(Location.whenRecorded) AS NumOfRec

    FROM User

    LEFT JOIN Location ON User.id = Location.user

    WHERE User.Gym IS NULL

    GROUP BY User.name

) AS UnregUser

FORMAT(AVG(regUser.NumOfRec),2)	FORMAT(AVG(UnregUser.NumOfRec),2)
25.60	11.00

1 Rows 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(

    SELECT Location.user,

    SQRT(POWER((Location.longitude-144.9630),2)+

        POWER((Location.latitude+37.7990),2))*100 AS RunInDst

    FROM Location) AS LA

LEFT JOIN User ON User.id = LA.user

WHERE LA.RunInDst < 0.1

name
Alice

1 Rows Returned

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

SELECT FORMAT(SQRT((POWER((Northest.La-Southest.La),2)

　　　　　　　　+POWER((Northest.La-Southest.La),2)))*100,2) AS DistKM

FROM (

　　SELECT Location.latitude AS La, Location.longitude AS Lo

　　FROM Location

　　WHERE Location.user = (SELECT User.id FROM User WHERE User.name = 'Alice')

　　ORDER BY Location.latitude DESC LIMIT 1

　　)　AS Northest, (

　　SELECT Location.latitude AS La, Location.longitude AS Lo

　　FROM Location

　　WHERE Location.user = (SELECT User.id FROM User WHERE User.name = 'Alice')

　　ORDER BY Location.latitude ASC LIMIT 1

　　)　AS Southest

DistKM
0.69

1 Rows Returned, Ans: 0.69km

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

SELECT FORMAT(SUM (SQRT((POWER((TABLE1.latitude-TABLE2.latitude),2)

    +POWER((TABLE1.longitude-TABLE2.longitude),2))

)*100),2) AS TotalDist

FROM(SELECT *

  FROM Location

  WHERE Location.user = (SELECT User.id FROM User WHERE User.name = 'Alice')

) AS TABLE1

JOIN Location AS TABLE2

WHERE TABLE2.user = (SELECT User.id FROM User WHERE User.name = 'Alice')

AND timestampdiff(minute, TABLE1.whenRecorded, TABLE2.whenRecorded) = 1

TotalDist
2.96

1 Rows Returned, Ans: 2.96km