**1.** List the total number of connections made.

**QUERY:**

SELECT

COUNT(DISTINCT (ConnectID)) AS connect\_count

FROM

connect;

**RESULT:**

# connect\_count

'68680'

**OUTPUT:**

05:20:24 SELECT COUNT(DISTINCT (ConnectID)) AS connect\_count FROM connect LIMIT 0, 10 1 row(s) returned 0.016 sec / 0.000 sec

**2.** List all the staff whose address contains the character string ‘st’ ignoring the case.

**QUERY:**

SELECT

StaffID, Surname

FROM

staff

WHERE

LCASE(Address) LIKE '%st%';

**RESULT:**

# StaffID, Surname

'1', 'VELLA'

'3', 'HILTON'

'6', 'SUMMERS'

'7', 'KNOL'

'8', 'PORTELLI'

'9', 'KHOR'

**OUTPUT:**

05:40:26 SELECT StaffID, Surname FROM staff WHERE LCASE(Address) LIKE '%st%' LIMIT 0, 10 6 row(s) returned 0.000 sec / 0.000 sec

**3.** List all the customers who are not active.

**QUERY:**

SELECT DISTINCT

(c.CustomerID),

CONCAT(c.Surname, ' ', c.Given) AS InctiveCustomersName

FROM

customer c

JOIN

mobile m ON (c.CustomerID = m.CustomerID)

WHERE

m.Cancelled IS NOT NULL;

**RESULT:**

# CustomerID, InctiveCustomersName

'20002', 'RAJOO THINH MINH'

'20004', 'PHONGWATCHARARUK JERZY MIROSLAW'

'20006', 'CHOW SOW LIM'

'20008', 'LIVERIADIS TONY'

'20030', 'BALTAS AARON BRYCE'

'20032', 'MOODIE CAHAL JOSEPH'

'20034', 'BENHAM SUSIE MEI YUN'

'20036', 'DWYER ANDREW ANTHONY'

'20052', 'VAGG CHEE HONG'

'20068', 'BENSON TIMOTHY FRANCIS'

**OUTPUT:**

16:33:06 SELECT DISTINCT (c.CustomerID), CONCAT(c.Surname, ' ', c.Given) AS InctiveCustomersName FROM customer c JOIN mobile m ON (c.CustomerID = m.CustomerID) WHERE m.Cancelled IS NOT NULL LIMIT 0, 10 10 row(s) returned 0.000 sec / 0.000 sec

**4.** Which plan gives the second biggest data allowance?

**QUERY:**

SELECT

PlanName

FROM

plan

ORDER BY DataAllowance DESC

LIMIT 1 , 1;

**RESULT:**

# PlanName

'Medium'

**OUTPUT:**

05:45:41 SELECT PlanName FROM plan ORDER BY DataAllowance DESC LIMIT 1 , 1 1 row(s) returned 0.000 sec / 0.000 sec

**5.** List the staff who gets more than the average hourly rate.

**QUERY:**

SELECT

StaffID, Surname, Given

FROM

staff

WHERE

RatePerHour > (SELECT

AVG(RatePerHour)

FROM

staff);

**RESULT:**

# StaffID, Surname, Given

'1', 'VELLA', 'SARATH AJITH L'

'2', 'MARZELLA', 'PATRICK MICHAEL'

'3', 'HILTON', 'HARRY RODNEY E'

'6', 'SUMMERS', 'TED'

'8', 'PORTELLI', 'CATHERINE MARY'

'10', 'SCANLON', 'MICHAEL JOHN'

**OUTPUT:**

05:50:07 SELECT StaffID, Surname, Given FROM staff WHERE RatePerHour > (SELECT AVG(RatePerHour) FROM staff) LIMIT 0, 10 6 row(s) returned 0.000 sec / 0.000 sec

**6.** List the top two selling plans.

**QUERY:**

SELECT

PlanName, COUNT(PlanName) AS count

FROM

mobile

GROUP BY PlanName

ORDER BY count DESC

LIMIT 2;

**RESULT:**

# PlanName, count

'Budget1', '246'

'ExtraSmall', '240'

**OUTPUT:**

05:54:58 SELECT PlanName, COUNT(PlanName) AS count FROM mobile GROUP BY PlanName ORDER BY count DESC LIMIT 2 2 row(s) returned 0.000 sec / 0.000 sec

**7.** List all the customers on “Extra small” plan.

**QUERY:**

SELECT

CustomerID, Surname, Given

FROM

customer

WHERE

CustomerID IN (SELECT

CustomerID

FROM

mobile

WHERE

PlanName = 'ExtraSmall');

**RESULT:**

# CustomerID, Surname, Given

'20002', 'RAJOO', 'THINH MINH'

'20004', 'PHONGWATCHARARUK', 'JERZY MIROSLAW'

'20006', 'CHOW', 'SOW LIM'

'20010', 'SAMARAWICKRAMA', 'JANE'

'20032', 'MOODIE', 'CAHAL JOSEPH'

'20050', 'JAMES', 'AMANDA CLARE'

'20068', 'BENSON', 'TIMOTHY FRANCIS'

'20070', 'HOSIE', 'MANG YAH JOHN'

'20088', 'DUONG', 'XUONG DAN'

'20136', 'VERCOE', 'SIN THENG'

**OUTPUT:**

05:57:26 SELECT CustomerID, Surname, Given FROM customer WHERE CustomerID IN (SELECT CustomerID FROM mobile WHERE PlanName = 'ExtraSmall') LIMIT 0, 10 10 row(s) returned 0.016 sec / 0.000 sec

**8.** From which towerId was the most recent call made?

**QUERY:**

SELECT

t2.TowerID,

DATEDIFF(CURRENT\_TIMESTAMP(), t1.CallDate) AS recency

FROM

calls t1,

connect t2

WHERE

t1.CallsID = t2.CallsID

ORDER BY recency ASC

LIMIT 1;

**RESULT:**

# TowerID, recency

'290', '793'

**OUTPUT:**

06:06:30 SELECT t2.TowerID, DATEDIFF(CURRENT\_TIMESTAMP(), t1.CallDate) AS recency FROM calls t1, connect t2 WHERE t1.CallsID = t2.CallsID ORDER BY recency ASC LIMIT 1 1 row(s) returned 0.078 sec / 0.000 sec

**9.** List all the customers who owned a phone of the same colour as the customer ‘Rajoo’ (i.e. surname).

**QUERY:**

SELECT

CustomerID, Surname, Given

FROM

customer

WHERE

CustomerID IN (SELECT DISTINCT

(CustomerID)

FROM

mobile

WHERE

PhoneColour IN (SELECT

PhoneColour

FROM

mobile

WHERE

CustomerID IN (SELECT

CustomerID

FROM

customer

WHERE

Surname = 'Rajoo')));

**RESULT:**

# CustomerID, Surname, Given

'22212', 'COX', 'D H CAROLINE KURUPPU'

'22124', 'JOY', 'SARVO SARVENDRAN'

'22106', 'COLEGRAVE', 'ALEX'

'22082', 'CHEN', 'TEDDY'

'22036', 'LOPEZ', 'KAREN LOUISE'

'22000', 'FISHER', 'YUAN NAN'

'21948', 'AITKEN', 'GREG ANDREW'

'21940', 'UNANTENNE', 'KELVIN'

'21930', 'GAO', 'LESLIE IRVING'

'21862', 'GOWERS', 'GLEN'

**OUTPUT:**

06:10:24 SELECT CustomerID, Surname, Given FROM customer WHERE CustomerID IN (SELECT DISTINCT (CustomerID) FROM mobile WHERE PhoneColour IN (SELECT PhoneColour FROM mobile WHERE CustomerID IN (SELECT CustomerID FROM customer WHERE Surname = 'Rajoo'))) LIMIT 0, 10 10 row(s) returned 0.015 sec / 0.000 sec

**10.** List all the customers (customer Id and name) having more than one mobile number.

**QUERY:**

SELECT

c.CustomerID, c.Surname, c.Given

FROM

customer c,

(SELECT

CustomerID, COUNT(CustomerID) AS number\_of\_phone

FROM

mobile

GROUP BY CustomerID

HAVING number\_of\_phone > 1) many\_phone

WHERE

c.CustomerID = many\_phone.CustomerID;

**RESULT:**

# CustomerID, Surname, Given

'20002', 'RAJOO', 'THINH MINH'

'20006', 'CHOW', 'SOW LIM'

'20008', 'LIVERIADIS', 'TONY'

'20010', 'SAMARAWICKRAMA', 'JANE'

'20012', 'GILTRAP', 'ELIZABETH JANE'

'20028', 'DE ALWIS', 'DAVID GEORGE A'

'20032', 'MOODIE', 'CAHAL JOSEPH'

'20036', 'DWYER', 'ANDREW ANTHONY'

'20052', 'VAGG', 'CHEE HONG'

'20068', 'BENSON', 'TIMOTHY FRANCIS'

**OUTPUT:**

06:14:09 SELECT c.CustomerID, c.Surname, c.Given FROM customer c, (SELECT CustomerID, COUNT(CustomerID) AS number\_of\_phone FROM mobile GROUP BY CustomerID HAVING number\_of\_phone > 1) many\_phone WHERE c.CustomerID = many\_phone.CustomerID LIMIT 0, 10 10 row(s) returned 0.000 sec / 0.000 sec

**11.** The company decided to re-name the budget3 plan to budget3Extra.

(a) How many customers will be affected? Show SQL to justify your answer.

**QUERY:**

SELECT

COUNT(DISTINCT(CustomerID))

FROM

mobile

WHERE

PlanName = 'Budget3';

**RESULT:**

# COUNT(DISTINCT(CustomerID))

'0'

**OUTPUT:**

06:27:41 SELECT COUNT(DISTINCT(CustomerID)) FROM mobile WHERE PlanName = 'Budget3' LIMIT 0, 10 1 row(s) returned 0.000 sec / 0.000 sec

(b) Write an SQL query which will update the database to reflect the upgrades?

**QUERY:**

SET SQL\_SAFE\_UPDATES = 0;

UPDATE mobile

SET

PlanName = 'Budget3Extra'

WHERE

PlanName = 'Budget3';

UPDATE plan

SET

PlanName = 'Budget3Extra'

WHERE

PlanName = 'Budget3';

SET SQL\_SAFE\_UPDATES = 1;

**RESULT:**

**OUTPUT:**

07:17:43 SET SQL\_SAFE\_UPDATES = 0 0 row(s) affected 0.000 sec

07:17:43 UPDATE mobile SET PlanName = 'Budget3Extra' WHERE PlanName = 'Budget3' 0 row(s) affected Rows matched: 0 Changed: 0 Warnings: 0 0.000 sec

07:17:43 UPDATE plan SET PlanName = 'Budget3Extra' WHERE PlanName = 'Budget3' 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0 0.015 sec

07:17:43 SET SQL\_SAFE\_UPDATES = 1 0 row(s) affected 0.000 sec

**12.** List the names of all the staff who have a supervisor, along with their supervisor’s name.

**QUERY:**

SELECT

staff\_with\_supervisor.StaffID,

staff\_with\_supervisor.Surname,

staff\_with\_supervisor.Given,

CONCAT(s.Surname, ', ', s.Given) AS Supervisor\_Names

FROM

staff s,

(SELECT

StaffID, Surname, Given, SupervisorID

FROM

staff

WHERE

SupervisorID > 0) staff\_with\_supervisor

WHERE

staff\_with\_supervisor.SupervisorID = s.StaffID;

**RESULT:**

# StaffID, Surname, Given, Supervisor\_Names

'2', 'MARZELLA', 'PATRICK MICHAEL', 'VELLA, SARATH AJITH L'

'4', 'JAMIESON', 'TERRENCE IAN', 'VELLA, SARATH AJITH L'

'5', 'SANDERS', 'RICHARD ANTHONY', 'VELLA, SARATH AJITH L'

'6', 'SUMMERS', 'TED', 'VELLA, SARATH AJITH L'

'7', 'KNOL', 'VINCENZO', 'HILTON, HARRY RODNEY E'

'8', 'PORTELLI', 'CATHERINE MARY', 'VELLA, SARATH AJITH L'

'9', 'KHOR', 'GLENDA JEAN', 'VELLA, SARATH AJITH L'

'10', 'SCANLON', 'MICHAEL JOHN', 'HILTON, HARRY RODNEY E'

**OUTPUT:**

07:49:25 SELECT staff\_with\_supervisor.StaffID, staff\_with\_supervisor.Surname, staff\_with\_supervisor.Given, CONCAT(s.Surname, ', ', s.Given) AS Supervisor\_Names FROM staff s, (SELECT StaffID, Surname, Given, SupervisorID FROM staff WHERE SupervisorID > 0) staff\_with\_supervisor WHERE staff\_with\_supervisor.SupervisorID = s.StaffID LIMIT 0, 10 8 row(s) returned 0.000 sec / 0.000 sec

**13.** Who is the longest serving staff? Display the StaffId, full name, date joined and the total years served.

**QUERY:**

SELECT

StaffID,

CONCAT(Surname, ', ', Given) AS FullName,

DATE(Joined) AS Joined,

TIMESTAMPDIFF(YEAR, Joined, CURDATE()) AS TotalYears

FROM

staff

ORDER BY TotalYears DESC

LIMIT 1;

**RESULT:**

# StaffID, FullName, Joined, TotalYears

'1', 'VELLA, SARATH AJITH L', '2012-04-16', '10'

**OUTPUT:**

08:02:40 SELECT StaffID, CONCAT(Surname, ', ', Given) AS FullName, DATE(Joined) AS Joined, TIMESTAMPDIFF(YEAR, Joined, CURDATE()) AS TotalYears FROM staff ORDER BY TotalYears DESC LIMIT 1 1 row(s) returned 0.000 sec / 0.000 sec

**14.** List all plans that have never been used by any customer. Show the query using:

i. Nested Query

**QUERY:**

SELECT

PlanName

FROM

plan

WHERE

PlanName NOT IN (SELECT DISTINCT

(PlanName)

FROM

mobile);

**RESULT:**

# PlanName

'Budget3Extra'

**OUTPUT:**

08:13:19 SELECT PlanName FROM plan WHERE PlanName NOT IN (SELECT DISTINCT (PlanName) FROM mobile) LIMIT 0, 10 1 row(s) returned 0.000 sec / 0.000 sec

ii. SQL Join

**QUERY:**

SELECT DISTINCT

(p.PlanName)

FROM

plan p

LEFT JOIN

mobile m ON (p.PlanName = m.PlanName)

WHERE

m.PlanName IS NULL;

**RESULT:**

# PlanName

'Budget3Extra'

**OUTPUT:**

09:18:17 SELECT DISTINCT (p.PlanName) FROM plan p LEFT JOIN mobile m ON (p.PlanName = m.PlanName) WHERE m.PlanName IS NULL LIMIT 0, 10 1 row(s) returned 0.000 sec / 0.000 sec

**15.** List the customer ID, customer name, phone number and the total number of hours (assume call duration is in seconds) the customer was on the phone during August of 2019 from each phone number the customer owns. Order the list from highest to the lowest number of hours.

**QUERY:**

SELECT

cs.CustomerID,

CONCAT(cs.Surname, ', ', cs.Given) AS CustomerName,

m.PhoneNumber,

SUM(c.CallDuration) / 3600 AS TotalHours

FROM

calls c

JOIN

mobile m ON c.MobileID = m.MobileID

JOIN

customer cs ON m.CustomerID = cs.CustomerID

WHERE

(MONTHNAME(c.CallDate) = 'August'

AND YEAR(c.CallDate) = 2019)

GROUP BY m.PhoneNumber

ORDER BY TotalHours DESC;

**RESULT:**

# CustomerID, CustomerName, PhoneNumber, TotalHours

'20144', 'THOMAS, CLAIRE JOY', '412228640', '0.8675'

'20210', 'YII, NICHOLAS VINCENT', '410242566', '0.8194'

'21066', 'PAESLER, KELVIN', '413637577', '0.7422'

'20092', 'OSHEA, SAMANTHA MARIE', '412407185', '0.6761'

'20934', 'TIWARI, BRUCE LYLE', '412300282', '0.6550'

'20344', 'CHIENG, THAI DUY HONG', '413349000', '0.6508'

'20068', 'BENSON, TIMOTHY FRANCIS', '410497755', '0.6375'

'21462', 'SCOTT, KURT', '411235428', '0.6322'

'21998', 'CHIA, IOANNIS', '410742690', '0.6128'

'20012', 'GILTRAP, ELIZABETH JANE', '411607013', '0.6044'

**OUTPUT:**

11:17:01 SELECT cs.CustomerID, CONCAT(cs.Surname, ', ', cs.Given) AS CustomerName, m.PhoneNumber, SUM(c.CallDuration) / 3600 AS TotalHours FROM calls c JOIN mobile m ON c.MobileID = m.MobileID JOIN customer cs ON m.CustomerID = cs.CustomerID WHERE (MONTHNAME(c.CallDate) = 'August' AND YEAR(c.CallDate) = 2019) GROUP BY m.PhoneNumber ORDER BY TotalHours DESC LIMIT 0, 10 10 row(s) returned 0.015 sec / 0.000 sec

**16.** i. Create a view that shows the popularity of each plan (i.e. how many plans are on each phone).

ii. Use this view in a query to determine the most popular plan.

**QUERY:**

CREATE VIEW PopularityView AS

SELECT

PlanName, COUNT(PlanName) AS populaity

FROM

mobile

GROUP BY PlanName;

SELECT

PlanName

FROM

PopularityView

ORDER BY populaity DESC

LIMIT 1;

**RESULT:**

# PlanName

'Budget1'

**OUTPUT:**

11:49:17 CREATE VIEW PopularityView AS SELECT PlanName, COUNT(PlanName) AS populaity FROM mobile GROUP BY PlanName 0 row(s) affected 0.015 sec

11:49:17 SELECT PlanName FROM PopularityView ORDER BY populaity DESC LIMIT 1 1 row(s) returned 0.000 sec / 0.000 sec

**17.** List the total number of connections made on each tower location after 2018.

**QUERY:**

SELECT

t.Location, COUNT(t.Location) AS TotalConnections

FROM

connect co

JOIN

calls ca ON (co.CallsID = ca.CallsID)

JOIN

tower t ON (co.TowerID = t.TowerID)

WHERE

YEAR(CallDate) > 2018

GROUP BY t.Location;

**RESULT:**

# Location, TotalConnections

'WINDSOR', '61'

'WERRIBEE', '144'

'MT WAVERLEY', '168'

'BENTLEIGH', '93'

'HAWTHORN', '310'

'EAST DONCASTER', '182'

'CLAYTON', '90'

'BOX HILL', '119'

'GLENROY', '81'

'MENTONE', '150'

**OUTPUT:**

14:34:44 SELECT t.Location, COUNT(t.Location) AS TotalConnections FROM connect co JOIN calls ca ON (co.CallsID = ca.CallsID) JOIN tower t ON (co.TowerID = t.TowerID) WHERE YEAR(CallDate) > 2018 GROUP BY t.Location LIMIT 0, 10 10 row(s) returned 0.109 sec / 0.000 sec

**18.** List all the details of the most recently joined and oldest joined Samsung phone user.

**QUERY:**

(SELECT

c.\*,

m.BrandName,

TIMESTAMPDIFF(YEAR, m.Joined, CURDATE()) AS YearofUsage

FROM

customer c

JOIN

mobile m ON (c.CustomerID = m.CustomerID)

WHERE

(m.BrandName = 'Samsung')

ORDER BY YearofUsage

LIMIT 1) UNION ALL (SELECT

c.\*,

m.BrandName,

TIMESTAMPDIFF(YEAR, m.Joined, CURDATE()) AS YearofUsage

FROM

customer c

JOIN

mobile m ON (c.CustomerID = m.CustomerID)

WHERE

(m.BrandName = 'Samsung')

ORDER BY YearofUsage DESC

LIMIT 1);

**RESULT:**

# CustomerID, Surname, Given, DOB, Sex, PhoneHome, PhoneWork, PhoneFax, Address, Suburb, State, Postcode, BrandName, YearofUsage

'20002', 'RAJOO', 'THINH MINH', '1963-05-31', 'M', '7842728', '8251837', '6955849', '11 HILDA CRES', 'WINDSOR', 'VIC', '3181', 'Samsung', '4'

'22228', 'MARRIOTT', 'JEFFREY DANIEL', '1993-10-17', 'M', '7061596', '8474802', '4264865', 'H525 RSD CRESWICK ROAD', 'NORTH BLACKBURN', 'VIC', '3130', 'Samsung', '22'

**OUTPUT:**

14:58:30 (SELECT c.\*, m.BrandName, TIMESTAMPDIFF(YEAR, m.Joined, CURDATE()) AS YearofUsage FROM customer c JOIN mobile m ON (c.CustomerID = m.CustomerID) WHERE (m.BrandName = 'Samsung') ORDER BY YearofUsage LIMIT 1) UNION ALL (SELECT c.\*, m.BrandName, TIMESTAMPDIFF(YEAR, m.Joined, CURDATE()) AS YearofUsage FROM customer c JOIN mobile m ON (c.CustomerID = m.CustomerID) WHERE (m.BrandName = 'Samsung') ORDER BY YearofUsage DESC LIMIT 1) 2 row(s) returned 0.000 sec / 0.000 sec

**19.** Produce a list of staff who joined on the same month. Order the result in the following format:

| **Month** | **JoinedDate** | **Name** |
| --- | --- | --- |
| July | 2012-07-12 00:00:00 | TERRENCE IANJAMIESON |
| July | 2012-07-21 00:00:00 | VINCENZOKNOL |

**QUERY:**

SELECT

MONTHNAME(Joined) AS JoinedMonth,

Joined AS JoinedDate,

CONCAT(Surname, ' ', Given) AS StaffName

FROM

staff

ORDER BY JoinedMonth DESC;

**RESULT:**

# JoinedMonth, JoinedDate, StaffName

'September', '2012-09-23 00:00:00', 'PORTELLI CATHERINE MARY'

'September', '2012-09-15 00:00:00', 'KHOR GLENDA JEAN'

'October', '2011-10-18 00:00:00', 'HILTON HARRY RODNEY E'

'May', '2013-05-29 00:00:00', 'SUMMERS TED'

'March', '2012-03-09 00:00:00', 'MARZELLA PATRICK MICHAEL'

'March', '2012-03-18 00:00:00', 'SCANLON MICHAEL JOHN'

'July', '2012-07-12 00:00:00', 'JAMIESON TERRENCE IAN'

'July', '2012-07-21 00:00:00', 'KNOL VINCENZO'

'January', '2013-01-21 00:00:00', 'SANDERS RICHARD ANTHONY'

'April', '2012-04-16 00:00:00', 'VELLA SARATH AJITH L'

**OUTPUT:**

16:08:52 SELECT MONTHNAME(Joined) AS JoinedMonth, Joined AS JoinedDate, CONCAT(Surname, ' ', Given) AS StaffName FROM staff ORDER BY JoinedMonth DESC 10 row(s) returned 0.000 sec / 0.000 sec

**20.** In not more than 200 words, explain at least two ways to improve this database based on what you have learned in weeks 1-8. Draw specific examples from the database to support your argument.

**ANSWER:**