Project 3 - Telephone customer churn:

- I am doing a SQl,Excel and Tableau project on Telephone customer churn.
- The Important thing is if you want to use the import wizard in SQL workbench then the file has to be in CSV format.
- I loaded the CSV file using the import wizard in SQL workbench but the entire data did not get loaded.
- So I created a table named CustomerChurn and below is the code

```
create table CustomerChurn
(
 #genere_id JSON NOT NULL,
LoyaltyID INT UNSIGNED NOT NULL,
CustomerID VARCHAR(255),
SeniorCitizen CHAR(5),
Partner CHAR(5),
Dependents CHAR(5) ,
Tenure INT UNSIGNED NOT NULL,
PhoneService CHAR(5),
MultipleLines VARCHAR(255),
OnlineSecurity VARCHAR(100),
OnlineBackup VARCHAR(100),
DeviceProtection VARCHAR(100),
TechSupport VARCHAR(100),
StreamingTV VARCHAR(100),
StreamingMovies VARCHAR(100),
Contract VARCHAR(100),
PaperlessBilling VARCHAR(100),
```

```
PaymentMethod VARCHAR(100),
MonthlyCharges FLOAT(10),
TotalCharges FLOAT(10),
Churn CHAR(10),
 primary key (CustomerID)
 );
```

- I wanted to load the csv file into this table and used the following set of commands which is

```
 LOAD DATA local INFILE
'C:/Users/Maithreyee/Downloads/Telecommunications_Industry/CustomerChurn.csv'
INTO TABLE CustomerChurn
FIELDS TERMINATED BY ','
#ENCLOSED BY '"'
#LINES TERMINATED BY '\n'
IGNORE 1 ROWS;
```

- When I ran the above set of commands I experienced the error 3948 which is “Loading local data is disabled:this must be enabled on both client and server side.
- This can be rectified by using the following set of commands

```
SHOW  global variables like 'local_inflie';
  Set global local_infile =true;
```

By running the above commands the error got resolved.

- The second error which I faced is 1146 which tells us the table name in the below set of commands is wrong

```
 LOAD DATA local INFILE
'C:/Users/Maithreyee/Downloads/Telecommunications_Industry/CustomerChurn.csv'
INTO TABLE sample
FIELDS TERMINATED BY ','
#ENCLOSED BY '"'
#LINES TERMINATED BY '\n'
```

```
IGNORE 1 ROWS;
```

Replace it with the proper table name and the command get executed

```
LOAD DATA local INFILE
'C:/Users/Maithreyee/Downloads/Telecommunications_Industry/CustomerChurn.csv'
INTO TABLE CustomerChurn
FIELDS TERMINATED BY ','
#ENCLOSED BY '"'
#LINES TERMINATED BY '\n'
IGNORE 1 ROWS;
```

Now I will be moving forward to explore each table individually and then combine them to see if I can find any patterns or insights as to why customer are leaving the telecommunication service

I had to alter two columns as they had been switched with each other. The values under the Under30 column had all the values of the Age column. Hence I used the **alter** command to make the changes into the database.

```
alter table customerdemographics
rename column Under30 to Ages;

alter table customerdemographics
rename column Age to Under30;

alter table customerdemographics
rename column Ages to Age
```

- Another issue which I faced is that the values were not getting properly loaded in the SQL workbench because the column names were different.

In SQL I had created a table in which all the column names were in CamelCase, but in the CSV file the column name was different. This can be one of the reasons due to which data cannot get loaded properly.
Eg in CSV it is Customer Id and in SQL is CustomerId. This can cause issues hence having the same column names in both csv and sql workbench is better and more efficient

- While mentioning the data types in creating the tables please mention the values for the datatype. For example, don't just mention Name CHAR. It has to be Name CHAR(150). Properly specify these numbers as the values won't be properly loaded onto the SQL workbench.

I am exploring the data of CustomerDemographics

Question 1 - What is the average customer age

```
   SELECT AVG(age)
FROM
   customerdemographics;
```

Answer - 46.5097

Question 2 . How many customer are there under 30 years
Answer -

```
select count(CustomerID)
from customerdemographics
where Under30='Yes'
```

Answer -1401

Question 3 : Number of customers who are Senior Citizens’

```
SELECT
   COUNT(CustomerID)
FROM
   customerdemographics
WHERE
   SeniorCitizen = 'Yes'
```

Answers: 1142

Question 4 : Number of Customers who are not under30 and who are not senior citizens

```
  SELECT
   COUNT(customerid)
FROM
   customerdemographics
WHERE
   Under30 = 'No' AND SeniorCitizen = 'No'
```

Answer - 4500

Table based on the age range

Age	Under30	SeniorCitizen	31-60
Number	1401	1142	4500

Insights : The number of customers between the ages of 31- 60 are more in number than customers who are Under30 or Senior Citizens.

Question 5: Total number of male and female customers

```
SELECT
   Gender, COUNT(CustomerID) AS TotalNumber
FROM
   customerdemographics
GROUP BY Gender
```

Ans : Female-3488 and Male- 3555

Question 6 : Total number of male and female customers Under30

```
SELECT
   gender, COUNT(CustomerID) AS totalnumber
FROM
   customerdemographics
WHERE
   under30 = 'Yes'
GROUP BY gender;
```

Female - 698
Male-703

Question 6 : Total number of male and female customers who are SeniorCitizens

```
SELECT
   gender, COUNT(CustomerID) AS totalnumber
FROM
```

```
    customerdemographics
WHERE
   SeniorCitizen = 'Yes'
GROUP BY gender;
```

Answer: Female : 568
Male - 574

Question 7: Total number of male and female customers who are neither under30 nor senior citizens.

```
SELECT
    gender, COUNT(CustomerID) AS totalnumber
FROM
    customerdemographics
WHERE
   SeniorCitizen = 'No' and Under30='No'
GROUP BY gender;
```

Answer - Female - 2222
Male -2278

Age Range based on Gender

Age	Under30	SeniorCitizen	Age range from 31-60	Total
Female	698	568	2222	3488
Male	703	574	2278	3555

Question 8 : Total number of customers who are married

```
SELECT
   COUNT(customerid)
FROM
   customerdemographics
WHERE
   married = 'yes';
```

Answer : 3402

Question 9 : Number of Male and Female customer who are married

```
SELECT
   Gender, COUNT(CustomerID) AS TotalNumber
FROM
   customerdemographics
WHERE
   married = 'Yes'
GROUP BY Gender;
```

Answer : Female 1688
Male : 1714

Question 10 : Number of male and female customers under 30 and married

```
SELECT
   Gender, COUNT(CustomerID) AS TotalNumber
```

```
FROM
    customerdemographics
WHERE
    married = 'Yes' and Under30='Yes'
GROUP BY Gender;
```

Male : 326
Female: 372
Total : 698

Question 11 : Number of male and customers who are SeniorCitizens and married

```
SELECT
    Gender, COUNT(CustomerID) AS TotalNumber
FROM
    customerdemographics
WHERE
    married = 'Yes' and SeniorCitizen='Yes'
GROUP BY Gender;
```

Male : 325
Female: 248
Total : 573

Question 12: Number of Male and Female customers who are neither under30 or senior Citizens and are married

```
SELECT
    gender, COUNT(CustomerID) AS totalnumber
FROM
    customerdemographics
WHERE
```

```
   SeniorCitizen = 'No' and Under30='No' and Married='Yes'
GROUP BY gender;
```

Female : 1068
Male: 1063
Total : 2131

Question 13: Number of customers who are not married

```
SELECT
    COUNT(customerid)
FROM
    customerdemographics
WHERE
    married = 'no';
```

Answer : 3641

Question 14 : Number of Male and female customers who are SeniorCitizens and not married

```
SELECT
    gender, COUNT(CustomerID) AS totalnumber
FROM
    customerdemographics
WHERE
   SeniorCitizen = 'Yes' and Under30='No' and Married='No'
GROUP BY gender;
```

Answer : Female : 320
Male : 249
Total : 569

Question 15 : Number of Male and female customers who are Under30 and not married

```
SELECT
    gender, COUNT(CustomerID) AS totalnumber
FROM
    customerdemographics
WHERE
   SeniorCitizen = 'No' and Under30='Yes' and Married='No'
GROUP BY gender;
```

Answer : Female : 326
Male : 377
Total : 703

Question 16 : Number of Customer who are neither senior citizens nor under30 nor married

```
SELECT
    gender, COUNT(CustomerID) AS totalnumber
FROM
    customerdemographics
WHERE
   SeniorCitizen = 'No' and Under30='No' and Married='No'
GROUP BY gender;
```

Male :1215
Female : 1154
Total : 2369

Table with respect to gender ,marriage and age range

	Married				Not Married			
	Under30	SeniorCitizen	Age Ranging from 31-60	Total	Under30	SeniorCitizen	Age Ranging from 31-60	Total
Female	372	248	1068	1688	326	320	1154	1800
Male	326	325	1063	1714	377	249	1215	1841
Grand Total				3402				3641

Insights:

- It can be observed that there are more female customers under 30 who are married and just 5 female customers less than the male customers in the age rangel between 31-60.
- The number of customers who are not married exceed more than the customers who are married
- No of female customers who are SeniorCitizens and not married and more than the male customers

Question 16 : Number of customers who have dependents :

```
Select Count(customerid)
from customerdemographics
where Dependents='Yes'
```

Answer :1627

Question 17 : Number of Citizens who have no dependents :

```
Select Count(customerid)
from customerdemographics
where Dependents='No''
```
Answer :5416

Question 17: Number of customers who have dependents and are married

```
SELECT
   COUNT(customerid)
FROM
   customerdemographics
WHERE
   Dependents = 'Yes' and Married='Yes'
```
Answer 1325

Question 18 : Number of customers who are not married and have dependents

```
SELECT
   COUNT(customerid)
FROM
   customerdemographics
WHERE
   Dependents = 'Yes' and Married='No'
```
   Answer 302

Insights - There are more customers who are married and have dependents than customers who are not married and have dependents.

	Dependents			No Dependents		
	Married	Unmarried		Married	Unmarried	
Number	1325	302		2077	3339	
Total			1627			5416

Insights:

- It can be observed that there are more customers who are married having dependents than unmarried customers having dependents.
- It can be observed that there are only 23.01% of the customers have dependents

Question 19 : Number of customers under30,married and have dependents

```
Select count(customerid)
FROM
   customerdemographics
WHERE
   Dependents = 'Yes' and Married='Yes' and Under30='Yes' and
SeniorCitizen='No';
```

Answer 301

Question 20 : Number of customers under30,married and have dependents

```
Select count(customerid)
FROM
   customerdemographics
WHERE
   Dependents = 'Yes' and Married='Yes' and Under30='Yes' and
SeniorCitizen='No';
```

Answer 62

Question 21: Number of customers who are neither under30 nor senior citizens and are married and have dependents

```
Select count(customerid)
FROM
   customerdemographics
WHERE
   Dependents = 'Yes' and Married='Yes' and Under30='No' and
SeniorCitizen='No';
```

Ans 962

Below is the table based on gender ,dependents and all the customers are **married**

	Customers with Dependents				
Age Range	Under30	SeniorCitizen	Age Ranging from 31-60		
Female	153	33	476		
Male	148	29	486		
Total	301	62	962	1627	

Question 22: The number of dependents where customers are married and have dependents and the no of dependents is greater than 5.

```
select count(*)
from customerdemographics
where dependents='Yes' and Married='Yes' and NumberOfDependents >=5
```

Answer 13

Question 21 : The number of dependents where customers are married and have dependents and the number of dependents is less than 5.

```
select count(*)
from customerdemographics
where dependents='Yes' and Married='Yes' and NumberOfDependents<5
```

Answer 1312

Question 33: The number of dependents where customers are not married and have dependents and the no of dependents is greater than 5.

```
select count(*)
from customerdemographics
where dependents='Yes' and Married='No' and NumberOfDependents>=5;
```

Answer =4

Question 34 : The number of dependents where customers are not married and have dependents and the no of dependents is less than 5.

```
select count(*)
from customerdemographics
where dependents='Yes' and Married='No' and NumberOfDependents<5;
```

Answer 298

Tables depending on whether the customers are married or not and the number of dependents they have

	Dependents				
	Married		Not Married		Total
	Less than 5	More than 5	Less than 5	More than 5	
	1312	13	298	4	1627

Insights :

- It can be seen that in married customers that the number of dependents is being more that 5 is just 0.8 % of the entire number of customers who are married and have dependents

The above table but with respect to gender

	Dependents				
	Married		Not Married		Total
	Less than 5	More than 5	Less than 5	More than 5	
Female	663	9	124	2	798
Male	649	4	174	2	829

- Based on the gender it can be observed that in the total customers female customers who are married and have less than 5 dependents are more than males by just 1%.

Question 35: The sum of the number of dependents

```
select sum(NumberOfDependents)
from customerdemographics
```

Ans 3301

Question 36: Avg of the number of dependents

```
select avg(NumberOfDependents)
from customerdemographics
```

0.4687

Question 37 : Max and min number of dependents

```
select min(NumberOfDependents)
from customerdemographics
where numberofDependents >0
```

Answer= 1

```
select max(NumberOfDependents)
from customerdemographics
```

Answer =9

	min	max	sum	avg
Number Of Dependents	1	9	3301	0.4687

Exploring customer location and customer population tables

Question 1: Top 5 cities where most customers are located

```
select city,count(customerid) as totalnumber
from customerlocation
group by city
order by totalnumber DESC
limit 5
```

Answer :

City	Total Number
Los Angeles	293
San Diego	285
San Jose	112
Sacramento	108
San Francisco	104

Question 2 :Top 10 cities with most number of customers

```
select city,count(customerid) as totalnumber
from customerlocation
group by city
order by totalnumber DESC
limit 10;
```

City	Total Number
Los Angeles	293
San Diego	285
San Jose	112
Sacramento	108
San Francisco	104
Fresno	61
Long Beach	60
Oakland	52
Escondido	51
Stockton	44

Question 3: Cities with the lowest customers

```
select city,count(customerid) as totalnumber
from customerlocation
group by city
order by totalnumber
limit 10;
```

City	Total number
Holtville	2
Eldridge	2
Johannesburg	2
Jacumba	2
South Lake Tahoe	2
Shasta	3
Topaz	3
Niland	3
Vina	3
Green Valley Lake	3

Question 5 : The number of customers with respective to zipcodes

```
select zipcode,count(customerid) as totalnumber
from customerlocation
group by zipcode
order by totalnumber DESC;
```

Question 4: Which zip codes have the most number of customers and which city they belong to in descending order

```
with zipcode as
(select zipcode,count(customerid) as totalnumber
from customerlocation
group by zipcode)

select distinct z.zipcode,c.city,z.totalnumber
from  zipcode z
inner join customerlocation c on z.zipcode=c.zipcode
order by z.totalnumber desc
limit 5;
```

Answer

zip code	City	Totalnumber
92028	Fallbrook	43
92027	Escondido	38
92122	San Diego	36
92117	San Diego	34
92126	San Diego	32

Question 5 : Which zip codes have the least number of customers and which city they belong to in ascending order

```
with zipcode as
(select zipcode,count(customerid) as totalnumber
from customerlocation
group by zipcode)

select distinct z.zipcode,c.city,z.totalnumber
from  zipcode z
inner join customerlocation c on z.zipcode=c.zipcode
order by z.totalnumber
limit 5;
```

Answer :

Zip Code	City	TotalNumber
93711	Fresno	1
95431	Eldridge	2
91934	Jacumba	2
93528	Johannesburg	2
92105	San Diego	2

Question 6: Join the customerlocation and customerpopulation table

```
select *
from customerlocation cl
left join customerpopulation cp on cl.zipcode=cp.zipcode;
```

I wanted to create a view by combining the columns customerID,state,city from customerlocation table and column population from customerpoplualtion table and the common column between them was zipcode.

Question 7 :Create a view to combine customerid, state,city, zipcode and population

The first view query I execute was

```
Create view locationpopulation as
Select *
From customerlocation cl,customerpoplulation cp
where cl.zipcode=cp.zipcode.
```

Here I faced an error 1060 which is there is a duplicate column named zipcode.

Here I understood that we should not use select * in a view as it defies the whole purpose of a view which is to have a concise form of the data.

Hence the proper query which I wrote to create a view

```
create view locationpoplulation as
select cl.customerID,cl.state,cl.city,cl.zipcode,cp.population
from customerlocation cl ,customerpopulation cp
where  cl.zipcode = cp.zipcode;
```

Question 8: Find the top 10 cities with the most population with respect to zipcode and the number of customers associated with that zipcode

```
select distinct city,population
from locationpoplulation
order by population DESC
limit 10;
```

Zip Code	City	Population	Total customers
90201	Bell	105285	5
90650	Norwalk	103124	5
90011	Los Angeles	101215	5
92054	Oceanside	98239	5
91331	Pacoima	97318	5
90280	South Gate	96267	5
90250	Hawthrone	93315	5
90805	Long Beach	91664	5
92704	Santa Ana	91188	4
94509	Antioch	90891	4

Question 9: Top 10 cities with the least population based on their zip codes

Zipcode	City	Population	Total customers
90263	Malibu	11	5
95937	Dunnigan	19	5
90071	Los Angeles	21	5
95232	Glencoe	21	4
92338	Ludlow	23	3
95735	Twin Bridges	25	4
95225	Burson	27	4
95978	Stirling City	28	4
95736	Weimar	31	4
95140	Mount Hamilton	38	4

Question 10: The zipcode with the most customers and the population with respect to that zipcode

zip code	population	City	Totalnumber
92028	42239	Fallbrook	43
92027	48690	Escondido	38
92122	34902	San Diego	36
92117	51213	San Diego	34
92126	74232	San Diego	32
92592	46171	Temecula	30
92109	46086	San Diego	27
92130	28201	San Diego	22
92121	4258	San Diego	20
92129	47224	San Diego	16

Question 11:The least number of customers present in each zipcode and the population with respect to that zipcode.

```
with cte as
(select distinct zipcode,population,city
from locationpoplulation
order by population
),

cte2 as
 (select zipcode ,count(customerid) as totalnumber
from locationpoplulation
group by zipcode)


select c1.zipcode,c1.population,c1.city,c2.totalnumber
from cte c1
left join cte2 c2 on c1.zipcode=c2.zipcode
order by totalnumber
limit 10;
```

Zip Code	Population	City	TotalNumber
93711	36274	Fresno	1
91934	699	Jacumba	2
95431	363	Eldridge	2
92105	73006	San Diego	2
92250	8062	Hotville	2
93528	207	Johannesburg	2
96150	33038	South Lake tahoe	2
92346	48245	HighLand	3
92338	23	Ludlow	3

96087	528	Shasta	3

Question 12: The number of zip codes associated with each city

```
select city,count(zipcode) as totalzipcodes
from locationpoplulation
group by city
order by totalzipcodes DESC
```

Insights:

- It can be observed that tha the total number of customers irrespective of zip code and population Los Angeles ranks first followed by San Diego and San Jose
- If the zipcode is taken into the picture it can be observed that the cities Fallbrook ,Escondido and San Diego have the most number of customers. It can be observed that total number of customers in Los Angeles is the hughes ,but these customers are scattered among the multiple zip codes associated with Los Angeles.
- The cities with the most population are Bell,Norwalk and Los Angeles ,but the number of customers associated with the city of Bell is 5 and Norwalk is 5 and Los Angeles is 293 which is very less considering the population.
- Our customers are distributed across 1106 cities across California.

Exploring customerservices table.

- The customer service table had multiple columns, which made it difficult to work with. Hence I decided to split the tables into multiple views.
- I was faced with a challenge as the view procedure requires a where clause and since I was creating a view from the same table I did not have a where clause.
- Looking at a table I found a column which had the same value for all the rows. The row was called quarter and the value for all the rows was ‘Q3’.
- Hence I used the above column as my where condition. This way I got a view with the column I needed so that it would be easy to work.
- However it is not necessary to have a where clause while creating a view.

Created a view called customerservice1

select * from customerservices;

```
create view customerservice1 as
select
customerid,referredafriend,numberofreferrals,tenureinmonths,offer,phoneservice
from customerservices
where yearlyquarter='Q3';
```

Question 1 : To find the number of customers to referred to a friend or did not refer to a friend

```
select count(customerId)
from customerservice1
where referredafriend='Yes'
```

	Referred a Friend	
	Yes	No
Total	3222	3821

Questions : The number of customers based on the number of referrals

```
select numberofreferrals,count(customerid) as totalnumber
from customerservice1
group by numberofreferrals
order by numberofreferrals DESC;
```

Number Of Referrals	Total Number
11	2
10	223
9	238
8	213

7	248
6	221
5	264
4	236
3	255
2	236
1	1086

Question 3 : Grouping the customers based on the number of months in tenure

```
select tenureinmonths,count(customerid) as totalnumber
from customerservice1
group by tenureinmonths
order by  tenureinmonths DESC;
```

Tenure in Months	Total number
72	362
71	170
70	119
69	95
68	100
67	98
66	89

65	76
64	80
63	72

Question 4: Grouping the customers based on the offeres

```
select offer,count(customerid) as totalnumber
from customerservice1
group by offer
order by offer;
```

Offer	Total number
Offer A	520
Offer B	824
Offer C	415
Offer D	602
Offer E	805
None	3877

Question 5 : Grouping the customers based on whether they are using the phone service or not

```
select phoneservice,count(customerid) as totalnumber
from customerservice1
group by phoneservice
```

Phone Service	Total Number
No	682
Yes	6361

A view is created based on the various monthly payment

```
create view customerservice2 as
select
customerID,paymentMethod,TotalLongDistanceCharges,AvgMonthlyLongD
istanceCharges,MonthlyCharge,Totalcharges,TotalRefunds,TotalExtraData
Charges,TotalRevenue
from customerServices;
```

Question 6: Grouping the customers based on the type of payment in the descending order

```
select paymentMethod,count(customerId) as totalnumber
from customerservice2
group by paymentMethod
order by totalnumber DESC
```

Answer

Payment	Total number
Bank Withdrawal	3909
Credit Card	2749
Mailed Check	385

Question 7: Write a case case statement to see which customers comes under which range of the total revenue

```
select customerID,TotalRevenue,
case
when totalRevenue >10000 then 'High'
When totalRevenue >=5000 then 'Medium'
when totalRevenue <5000 then 'Low'
else 'Extremetly Low'
end as Revenue_classification
from customerservice2;
```

Question 8; Following up to the previous question using the above query find the number of customers present in each range

```
with TotalReveueRange as
(
select customerID,TotalRevenue,
case
when totalRevenue >10000 then 'High'
When totalRevenue >=5000 then 'Medium'
when totalRevenue <5000 then 'Low'
else 'Extremetly Low'
end as Revenue_classification
from customerservice2)

select revenue_classification,count(customerid) as totalnumber
from TotalReveueRange
group by revenue_classification
```

Answer :

Revenue_Classification	Totalnumber
Low	5359
Medium	1561
High	123

Question 9 .Find the sum and average of the total revenue column

```
select round(sum(totalrevenue),2) as sumtotalrevenue
from customerservice2;
```

Answer - 21371131.68 -Sum and the average is - 3034.38

Question 10:Customer with total maximum total revenue and minimum total revenue

```
select customerid,totalrevenue as maximum
from customerservice2
where totalrevenue in (select max(totalrevenue)
                       from customerservice2);
```

And

```
  select customerid,totalrevenue as maximum
from customerservice2
where totalrevenue in (select min(totalrevenue)
                       from customerservice2);
```

	Customer Id	Value
Min	7853-WNZSY	21.36
Max	0164-APGRB	11979.3

Question 11: The number of customers present in each range and the range which are high,medium and low

```
with TotalchargesRange as
(
select customerID,Totalcharges,
case
when totalcharges > 6000 then 'High'
When totalcharges <6000 and totalcharges>3000  then'Medium'
when totalcharges <3000 then 'Low'
end as totalcharges_classification
from customerservice2
)

select totalcharges_classification,count(customerid) as totalnumber
from TotalchargesRange
group by totalcharges_classification;
```

Total charges classification	Total number
High	692
Medium	1512
Low	4839

Question 12: Sum and avg of total charges

```
select round(sum(totalcharges),2) as
sumtotalcharges,round(avg(totalcharges),2) as avgerage
from customerservice2;
```

Sum -16060725.24, Average- 2280.38

Question13: The customer id who have the maximum total charges and the minimum total charges

```
select customerid,totalcharges as maximum
from customerservice2
where totalcharges in (select max(totalcharges)
                       from customerservice2)
```

And minimum

```
select customerid,totalcharges as minimum
from customerservice2
where totalcharges in (select min(totalcharges)
                       from customerservice2)
```

	Customer Id	Value
Min	2967-MXRAV	18.8
Max	2889-FPWRM	8684.6

Question 14: The number of customers who have gotten refunds

Refund	Yes	No
Total number	525	6518

Question 15: The sum and the average of the total refund columns

```
select  round(sum(totalrefunds),2) as sum, round(avg(totalrefunds),2)
from customerservice2
```

Sum -13819.65 average- 1.96

Question 16 :The customer who has received the maximum refund is

```
select customerid,totalrefunds as maximum
from customerservice2
where totalrefunds in (select max(totalrefunds)
                       from customerservice2);
```

Answer customer id - 1270-XKUCC , total refund- 49.79

Question 17: To find the customer with minimum refund

Here we cannot use min as the values in other rows are 0 and it will return the value 0 as min. TO find the actually min value we

```
with Totalrefundsvalues  as
(
select customerid,totalrefunds as minimum
from customerservice2
where totalrefunds not in (select min(totalrefunds)
                    from customerservice2))

select customerid ,minimum
from Totalrefundsvalues
where minimum in (select min(minimum)
                from totalrefundsvalues);
```

Answer customerid- 0214-JHPFW minimum-1.01

Question 18: The sum and average of the the column total extra data charges

Since there are 42 customers who have the maximum value I modified the queasy to give me the count of the maximum value

```
select totalextradatacharges as maximum,count(customerid) as
totalnumber
from customerservice2
where totalextradatacharges in (select max(totalextradatacharges)
                    from customerservice2)
group by maximum
```

Maximum 150 total number -42

Question 19: The number of customers who have a paid a minimum for extra data charges .

```
with Totalextradatacharges  as
(
select customerid,totalextradatacharges as minimum
from customerservice2
where totalextradatacharges not in (select min(totalextradatacharges)
                    from customerservice2))

select minimum,count(customerid)as totalnumber
from totalextradatacharges
where minimum in (select min(minimum)
                from totalextradatacharges)
group by minimum;
```

Answer minimum is 10 and the number of customers with that minimum value is 139

Question 20: The number of customers who paid for extracharge

Extra charges	Yes	No
Total number	525	6518

Question 21 : Find the number of custoemrs who have totalLong distance charges zero.alter

```
select count(customerid) as totalnumebr
from customerservice2
where TotalLongDistanceCharges =0
```

Answer 682.

Question 22: Find the sum and the average of the coulmn Long Distance chargers

```
select round(sum(totallongdistancecharges),2) as sum ,
round(avg(totallongdistancecharges),2) as average
from customerservice2;
```

Answer sum-5275906.1 average - 749.1

Question 23 :The customer with the maximum long distance change and the minimum

```
select customerid,totallongdistancecharges as maximum
from customerservice2
where totallongdistancecharges in (select max(totallongdistancecharges)
                    from customerservice2);
```

Since there are 682 customers who have no total long distance chargers
We have to use another way to find the minimum which is

```
with totallongdistancechargesvalues  as
(
select customerid,totallongdistancecharges as minimum
from customerservice2
where totallongdistancecharges not in (select min(totalrefunds)
                    from customerservice2))

select customerid ,minimum
from totallongdistancechargesvalues
where minimum in (select min(minimum)
                from totallongdistancechargesvalues);
```

	Customer Id	Value
Min	9725-scpzg	1.13
Max	1926-QUZNN	3564.72

Question 24: The sum and the average of monthly charges

```
 select round(sum(monthlycharge),2) as sum ,
round(avg(monthlycharge),2) as average
from customerservice2;
```

Sum -456116.6 and average - 64.76

Question 25: To find the max and the minimum customers of monthly charges

```
select customerid,monthlycharge as maximum
from customerservice2
where monthlycharge in (select max(monthlycharge)
                        from customerservice2);
```

customerID- 7569-NMYQ maximum -118.75

Question 26: Find the minimum customers of monthly charges

```
      select customerid,monthlycharge as minimum
from customerservice2
where monthlycharge in (select min(monthlycharge)
                        from customerservice2);
```

Customerid -6823-SIDFQ minimum -18.25

Question 27: select sum and average of avgmonthlylongdistancecharges charges

```
    select round(sum(avgmonthlylongdistancecharges),2) as sum ,
round(avg(avgmonthlylongdistancecharges),2) as average
from customerservice2;
```

Sum -161699.91 ,Average -22.96

Question 27: The maximum values of the average monthly long distance charges and the customer id associated

```
select customerid,avgmonthlylongdistancecharges as maximum
from customerservice2
where avgmonthlylongdistancecharges in (select
max(avgmonthlylongdistancecharges)
                    from customerservice2);
```

Customerid -5338-YHWYT maximum -49.99

Question 28: The minimum values of the average monthly long distance charges and the customer id associated

```
 with avgmonthlylongdistancechargesvalues  as
(
select customerid,avgmonthlylongdistancecharges as minimum
from customerservice2
where avgmonthlylongdistancecharges not in (select
min(avgmonthlylongdistancecharges)
                    from customerservice2))

select customerid ,minimum
from avgmonthlylongdistancechargesvalues
where minimum in (select min(minimum)
                from avgmonthlylongdistancechargesvalues);
```

customer ID 2501-XWWTZ minimum 1.01

Exploring the table customer service 3

Question 29: The number of customers who have multiple lines and the who do not have multiple lines, InternetService,Internet Type,Online Security,Online Backup,Device Protection Plan,Premium Tech Support

```
select multiplelines,count(customerid) as total_number
from customerservice3
group by multiplelines;
```

```
select OnlineSecurity,count(customerid) as total_number
from customerservice3
group by OnlineSecurity;

select OnlineSecurity,count(customerid) as total_number
from customerservice3
group by OnlineSecurity ;

select OnlineBackup,count(customerid) as total_number
from customerservice3
group by OnlineBackup;

select DeviceProtectionPlan,count(customerid) as total_number
from customerservice3
group by DeviceProtectionPlan;

select PremiumTechSupport,count(customerid) as total_number
from customerservice3
group by PremiumTechSupport;
```

	Multiple Lines		Internet Service		Online Security		Online Backup		Device Protection Plan		Premium Tech Support	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Total number	4072	2971	5517	1526	2019	5024	2429	4614	4621	2422	4999	2044

Question 30: The number of customers who are streaming tv,movies and music.

```
select StreamingTV,count(customerid) as total_number
from customerservice3
group by StreamingTV;
```

```
select StreamingMovies,count(customerid) as total_number
from customerservice3
group by StreamingMovies;
```

```
select StreamingMusic,count(customerid) as total_number
from customerservice3
group by StreamingMusic;
```

	Streaming Music		Streaming Movies		Streaming Music	
	Yes	No	Yes	No	Yes	No
Total number	2707	4336	2732	4311	2488	4555

Question 31 : Number of customers with paperless billing and unlimited data

	Unlimited data		Paperless billing	
	Yes	No	Yes	No
Total number	4754	2298	4171	2872

Question 31: Group the customers based on the internet type

```
select InternetType,count(customerid) as total_number
from customerservice3
group by InternetType
order by total_number DESC;
```

Internet Type	Total Number
Fiber Optic	3035
DSL	1652
None	1526
Cable	830

Question 32 : Based on the contract

Contract	Total Number
Month to Month	3610
Two Year	1883
One Year	1550

Quedtion 33: Based on the avg gb sues for downloading.

```
with AvgMonthlyGBDownloaded as
(
select customerID, AvgMonthlyGBDownload,
case
when  AvgMonthlyGBDownload >=60 then 'High'
When  AvgMonthlyGBDownload <60 and  AvgMonthlyGBDownload>30
then'Medium'
when  AvgMonthlyGBDownload <=30 then 'Low'
else 'Extremetly Low'
end as AvgMonthlyGBDownloaded_classification
from customerservice3
)

select AvgMonthlyGBDownloaded_classification,count(customerid) as
totalnumber
from AvgMonthlyGBDownloaded
group by AvgMonthlyGBDownloaded_classification;
```

Avg Monthly GB Downloaded	Total number
Low	5841
High	362
Medium	840

Question 31: The number of customers who have 0 avg month gb downalded

```
select avgmonthlygbdownload,count(customerid) as totalnumber
from customerservice3
where avgmonthlygbdownload=0;
```

Answer - 0 -1526.

Question 32: The number of customers who have the maximum data downloaded is

```
select customerid,avgmonthlygbdownload as maximum
from customerservice3
where avgmonthlygbdownload in (select max(avgmonthlygbdownload)
                    from customerservice3);
```

There are 48 cusotmers who have downloaed the maximum number of data which is 85 gb

Question 33: The mimium data downladed higher than 0 is

```
 with avgmonthlygbdownloadvalues  as
(
```

```
select customerid,avgmonthlygbdownload as minimum
from customerservice3
where avgmonthlygbdownload not in (select min(avgmonthlygbdownload)
                    from customerservice3))

select customerid ,minimum
from avgmonthlygbdownloadvalues
where minimum in (select min(minimum)
                from avgmonthlygbdownloadvalues);
```

Answer is 2 and the number of customers is 116

Question 34. The sum and the average of the average downlaoded column

```
 select round(sum(avgmonthlygbdownload),2) as sum ,
round(avg(avgmonthlygbdownload),2) as average
from customerservice3;
```

The sum is 144490
The average is 20.52

Exploring the customerstatus table

Question 1 : Grouping the customers depending on the customer status

```
select customerstatus,count(customerstatus) as totalnumber
from customerstatus
group by customerstatus;
```

CustomerStatus	Total number
Stayed	4720
Churned	1869
Joined	454

Created a view which include the cltv range,this range is in connection with then cltv score which indicates that higher the cltv the customer is more valuable.

Question 2: Grouping the customers based on score.

```
select churnscore,count(customerid) as total_number
from customerstatus
group by churnscore;
```

Churn Score	Total number
91	202
80	150
71	148
77	145
67	142
76	140
68	140
90	139
70	138

Question 3 : The top 10 reasons customers have left

```
select churnreason,count(customerid) as totalcount
from customerstatus1
where customerstatus='churned'
group by churnreason
order by totalcount DESC
limit 10;
```

Churn reason	Total count
Competitor has better devices	313
Competitor made better offer	311
Attitude of support person	220
Don't know	130
Competitor offered more data	117
Competitor offered higher download speeds	100
Attitude of service provider	94
Price too high	78
Product dissatisfaction	77
Network reliability	72

Question 4 : The category in which customers have churned

```
select churncategory,count(customerid) as totalcount
from customerstatus1
where customerstatus='churned'
group by churncategory
order by totalcount DESC
limit 10;
```

Churn Category	Total count
Competitor	841
Attitude	314
Dissatisfaction	303
Price	211
Other	200

Question 5 : The percentage of stayed ,churned and joined out of 7043 customers

Stayed - 67.01%
Churned - 26.53%
Joined - 6.44%

Question 6: Group the customers with respect to the satisfaction score

```
select statisfactionscore ,count(customerid) as totalcount
from customerstatus
group by statisfactionscore
order by statisfactionscore DESC;
```

Satisfaction score	Totalcount
5	1149
4	1789
3	2665
2	518
1	922

Now analysis the reason for churn

With regards with the customer demographics

Question 1 : Grouping the number of male and female customers ‘with cte1 as
(select cs.customerid,cs.statisfactionscore,
cs.churncategory,cs.churnreason,cs.cltv_range,cd.gender
from customerstatus1 cs
left join customerdemographics cd on cs.customerid=cd.customerid
where customerstatus='churned')

```
select gender,count(customerid) as totalcount
from cte1
group by gender
```

Answer - From the above it can be seen more females customer are little more in number than the male customers

Female-939
Male-930

Question 2: The age group in which the male and female customers are based on Under30,seniorCitizens and those who belong to neither of the categories

Under 30

```
with cte1 as
(select cs.customerid,cs.statisfactionscore,
cs.churncategory,cs.churnreason,cs.cltv_range,cd.gender,cd.under30
from customerstatus1 cs
left join customerdemographics cd on cs.customerid=cd.customerid
where customerstatus='churned')
```

```
select gender,count(customerid) as totalcount
from cte1
where Under30='Yes'
group by gender;
```

SeniorCitizen

```
with cte1 as
(select cs.customerid,cs.statisfactionscore,
cs.churncategory,cs.churnreason,cs.cltv_range,cd.gender,cd.under30,cd.se
niorcitizen
from customerstatus1 cs
left join customerdemographics cd on cs.customerid=cd.customerid
where customerstatus='churned')
```

```
select gender,count(customerid) as totalcount
from cte1
where SeniorCitizen='Yes’
group by gender;
```

```
with cte1 as
(select cs.customerid,cs.statisfactionscore,
cs.churncategory,cs.churnreason,cs.cltv_range,cd.gender,cd.under30,cd.se
niorcitizen
from customerstatus1 cs
left join customerdemographics cd on cs.customerid=cd.customerid
where customerstatus='churned')
```

```
select gender,count(customerid) as totalcount
from cte1
where SeniorCitizen='No' and Under30='No'
group by gender;
```

	Under30		Senior Citizen		Neither	
	Female	Male	Female	Male	Female	Male
	163	141	240	236	536	553

Question 3 : The number of customers who have dependents and have churned.

Insights - **Out of 7043 customers there are only 1627 customers who have dependents and in that 106 customers have churned.**

```
select
cs.customerid,cd.dependents,cd.numberofDependents,cd.gender,cs.churnr
eason
from customerstatus cs
left join customerdemographics cd on cs.customerid=cd.customerid
where dependents='Yes' and customerstatus='churned'
```

Question 4: The most common churn reason as to why customers with dependents left the service

```
with cte1 as
(select
cs.customerid,cd.dependents,cd.numberofDependents,cd.gender,cs.churnreason
from customerstatus cs
left join customerdemographics cd on cs.customerid=cd.customerid
where dependents='Yes' and customerstatus='churned')


select churnreason,count(customerid) as totalnumber
from cte1
group by churnreason
order by totalnumber DESC
Limit 5
```

Churn Reason	Total number
Competitor has better devices	16
Attitude of support person	14
Competitor made better offer	11
Service dissatisfaction	8
Attitude of Service provider	7

Question 5 : The number of customers who have left with respect to gender is

```
with cte1 as
```

```
(select
cs.customerid,cd.dependents,cd.numberofDependents,cd.gender,cs.churnr
eason
from customerstatus cs
left join customerdemographics cd on cs.customerid=cd.customerid
where dependents='Yes' and customerstatus='churned')


select gender,count(customerid) as totalnumber
from cte1
group by gender
order by totalnumber DESC
```

Female - 60
Male -46

Question 5 : Major reason as to why female and male customers have churned who have dependents

Answer -Female -The major reason is because they did not like the attitude of the support person

Male - The competitors have offered better devices

```
with cte1 as
(select
cs.customerid,cd.dependents,cd.numberofDependents,cd.gender,cs.churnr
eason
from customerstatus cs
left join customerdemographics cd on cs.customerid=cd.customerid
where dependents='Yes' and customerstatus='churned')
```

```
select churnreason,count(customerid) as tc
from cte1
where gender='male'
group by churnreason
order by tc DESC
```

Question 6 : Checking the churn based on the number of dependents

```
with cte1 as
(select
cs.customerid,cd.dependents,cd.numberofDependents,cd.gender,cs.churnr
eason
from customerstatus cs
left join customerdemographics cd on cs.customerid=cd.customerid
where dependents='Yes' and customerstatus='churned')

select customerid,gender,churnreason,numberofdependents
from cte1
order by numberofdependents DESC
```

Question 7 :the number of customers who are married and have churned and the category they belong to which is whether they are under30 or senior citizens or neither.

```
select count(cd.customerid) as tc
from customerdemographics cd
left join customerstatus1 cs on cd.customerid=cs.customerid
where customerstatus='churned' and married='yes'
```

Answer -669

Now which category the belong to

```
with cte1 as
(
 select cs.customerid,cs.statisfactionscore,
cs.churncategory,cs.churnreason,cs.cltv_range,cd.married,cd.gender,cd.un
der30,cd.seniorcitizen
from customerstatus1 cs
left join customerdemographics cd on cs.customerid=cd.customerid
where customerstatus='churned' and married='Yes')


select gender,count(customerid) as totalcount
from cte1
where SeniorCitizen='No' and Under30='No'
group by gender;
```

Married	Under30		Senior Citizen		Neither	
	Female	Male	Female	Male	Female	Male
	58	46	81	117	180	187

Analysis of the churned customers with respect to the location

Question 1 : To check from which zipcode and city and population with respect to the zipcode have churned

```
with cte1 as
(select
lp.customerid,lp.city,lp.state,lp.zipcode,cs.churnscore,cs.churncategory,cs.c
hurnreason,cs.cltv_range
from customerstatus1 cs
left join locationpoplulation lp on lp.customerid=cs.customerid
where customerstatus='churned'),

cte2 as
(select zipcode,count(customerid) as tc
from cte1
group by zipcode
order by tc DESC)

select distinct  c.zipcode,c.tc, lp.city,lp.population
from cte2 c
left join locationpoplulation lp on c.zipcode=lp.zipcode
order by c.tc DESC
Limit 10;
```

Answer

Zip Code	Total count	City	Population
92122	33	San Diego	34902
92117	30	San Diego	51213
92126	28	San Diego	74232
92028	26	Fallbrook	42239
92109	24	San Diego	46086
92130	20	San Diego	28201
92592	18	Temecula	46171
92121	17	San Diego	4258
92129	15	San Diego	47224
92027	15	Escondido	48690

Analyzing the customerstatus with the customerservice1 table

Question 1: with cte1 as
(select cu.customerid ,cu.referredafriend ,cu.numberofreferrals
,c.churncategory,c.churnreason
from customerstatus1 c
left join customerservice1 cu on c.customerid=cu.customerid
where customerstatus='Churned')

select referredafriend,count(customerid) as tc
from cte1
group by referredafriend;

Referred A friend	Total count
No	1245
Yes	624

Question 2 : Number of customers who have churned and have referred grouping them in the various categories they have churned

with cte1 as
(select cu.customerid ,cu.referredafriend ,cu.numberofreferrals
,c.churncategory,c.churnreason
from customerstatus1 c
left join customerservice1 cu on c.customerid=cu.customerid

```
where customerstatus='Churned' and referredafriend='Yes'
order by cu.numberofreferrals DESC)

select churncategory ,count(customerid) as totalcount
from cte1
group by churncategory
order by totalcount DESC
```

Churncategory	Totalcount
Competitor	281
Dissatisfaction	116
attitude	99
Other	71
Price	57

Question 3: The number of customers who have churned with respect o phone service

Phone service	Total count
Yes	1699
No	170

Question 4: Checking the tenure of the churned customers

```
with cte1 as
(select cu.customerid ,cu.tenureinmonths ,c.churncategory,c.churnreason
from customerstatus1 c
left join customerservice1 cu on c.customerid=cu.customerid
where customerstatus='Churned'
order by tenureinmonths DESC)

select tenureinmonths,count(customerid) as tc
from cte1
group by tenureinmonths
order by  tenureinmonths DESC
```


Tableau