

PREDICTING CUSTOMER CHURN IN TELECOM INDUSTRY

By using SQL Queries the data extraction and preprocessing based on our needs for getting desire output for finding churned customer in telecom industry.

Data preprocessing SQL queries and output of the queries has been explained further

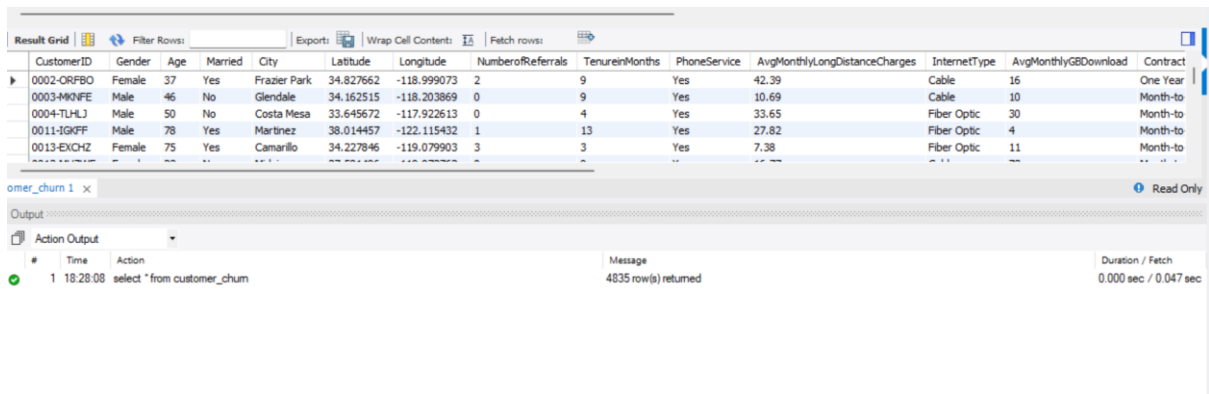
By using,

SQL CODE

```
SELECT * FROM CUSTOMER_CHURN;
```

We can able to view the uploaded data in the SQL Workbench Schema- Table

OUTPUT



CustomerID	Gender	Age	Married	City	Latitude	Longitude	NumberofReferrals	TenureinMonths	PhoneService	AvgMonthlyLongDistanceCharges	InternetType	AvgMonthlyGBDownload	Contract
0002-ORFBO	Female	37	Yes	Frazier Park	34.827662	-118.999073	2	9	Yes	42.39	Cable	16	One Year
0003-MKQFE	Male	46	No	Glendale	34.162515	-118.203869	0	9	Yes	10.69	Cable	10	Month-to
0004-TUHLJ	Male	50	No	Costa Mesa	33.645672	-117.922613	0	4	Yes	33.65	Fiber Optic	30	Month-to
0011-YGKFF	Male	78	Yes	Martinez	38.014457	-122.115432	1	13	Yes	27.82	Fiber Optic	4	Month-to
0013-EXCHZ	Female	75	Yes	Camarillo	34.227846	-119.079903	3	3	Yes	7.38	Fiber Optic	11	Month-to

omer_churn 1 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
1	18:28:08	select * from customer_churn	4835 row(s) returned	0.000 sec / 0.047 sec

SQL CODE

```
alter table customer_churn
```

```
drop column NumberofDependents,
```

```
drop column ZipCode,
```

```
drop column offer,
```

```
drop column MultipleLines,
```

```
drop column InternetService,
```

drop column OnlineSecurity,
drop column OnlineBackup,
drop column DeviceProtectionPlan,
drop column premiumtechsupport,
drop column streamingtv,
drop column streamingmovies,
drop column streamingmusic,
drop column unlimiteddata,
drop column paperlessbilling;

By using this SQL code for clean and preprocessing the telecom data.

The purpose of this code is dropping the column in the uploaded table.

SQL CODE

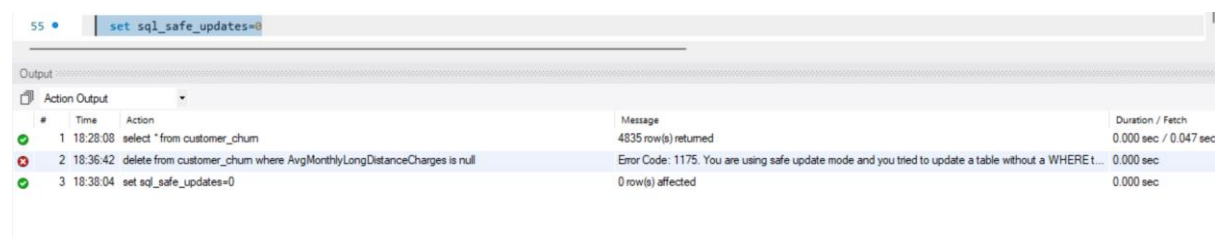
delete from customer_churn
where AvgMonthlyLongDistanceCharges is null
delete from customer_churn
where internettype is null

By using the SQL code for removing the null values in the table.

In these two codes are removing the null values in the column name “Avg monthly long-distance charges” and “internet type”.

While running the null query safety error will get pop-up for that need to run safe code in SQL

set sql_safe_updates=0



#	Time	Action	Message	Duration / Fetch
1	18:28:08	select * from customer_churn	4835 row(s) returned	0.000 sec / 0.047 sec
2	18:36:42	delete from customer_churn where AvgMonthlyLongDistanceCharges is null	Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE t...	0.000 sec
3	18:38:04	set sql_safe_updates=0	0 row(s) affected	0.000 sec

After the execution of safe mode query, we will get the output for NULL values removing query

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	18:28:08	select * from customer_churn	4835 row(s) returned	0.000 sec / 0.047 sec
2	18:36:42	delete from customer_churn where AvgMonthlyLongDistanceCharges is null	Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE t...	0.000 sec
3	18:38:04	set sql_safe_updates=0	0 row(s) affected	0.000 sec
4	18:40:36	delete from customer_churn where AvgMonthlyLongDistanceCharges is null	0 row(s) affected	0.032 sec

Adding column,

SQL CODE

ALTER TABLE customer_churn ADD churn_flag INT;

UPDATE customer_churn

SET churn_flag = CASE

WHEN customerstatus = 'Churned' THEN 1

WHEN customerstatus = 'Stayed' THEN 0

when customerstatus= 'joined' then 0

ELSE NULL -- Handle any unexpected or missing statuses

END;

By using this query create a new column in the table for predicting the churned customer in the telecom industry

#	PaymentMethod	MonthlyCharge	TotalCharges	TotalRefunds	TotalExtraDataCharges	TotalLongDistanceCharges	TotalRevenue	CustomerStatus	ChurnCategory	ChurnReason	churn_flag
1	Credit Card	65.6	593.3	0	0	381.51	974.81	Stayed			0
2	Credit Card	-4	542.4	38.33	10	96.21	610.28	Stayed			0
3	Bank Withdrawal	73.9	280.85	0	0	134.6	415.45	Churned	Competitor	Competitor had better devices	1
4	Bank Withdrawal	98	1237.85	0	0	361.66	1599.51	Churned	Dissatisfaction	support & CH issues	1
5	Credit Card	83.9	267.4	0	0	22.14	289.54	Churned	Dissatisfaction	Network reliability	1

Finding the Total customer count by using SQL query,

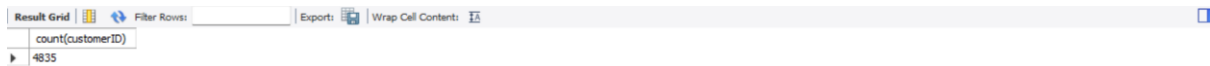
select count(customerID)

from customer_churn;

After the cleaning and preprocessing the data finding out the total count of the customer in the telecom data.

In this data count is includes the stayed, joined, churned customer in the telecom services.

OUTPUT



count(customerID)
4835

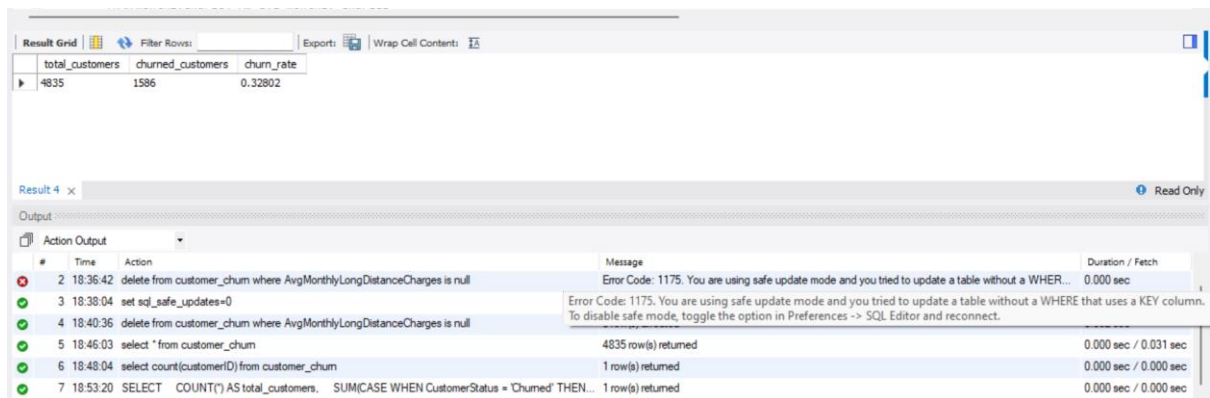
Identify the total number of customers and the churn rates

SQL CODE

SELECT

```
COUNT(*) AS total_customers,  
  
SUM(CASE WHEN CustomerStatus = 'Churned' THEN 1 ELSE 0 END) AS  
churned_customers,  
  
AVG(CASE WHEN CustomerStatus = 'Churned' THEN 1.0 ELSE 0.0 END) AS churn_rate  
  
FROM  
  
customer_churn;
```

OUTPUT:



	total_customers	churned_customers	churn_rate
▶ 4835	1586	0.32802	

#	Time	Action	Message	Duration / Fetch
2	18:36:42	delete from customer_churn where AvgMonthlyLongDistanceCharges is null	Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE...	0.000 sec
3	18:38:04	set sql_safe_updates=0		
4	18:40:36	delete from customer_churn where AvgMonthlyLongDistanceCharges is null	Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE that uses a KEY column. To disable safe mode, toggle the option in Preferences -> SQL Editor and reconnect.	
5	18:46:03	select * from customer_churn	4835 row(s) returned	0.000 sec / 0.031 sec
6	18:48:04	select count(customerID) from customer_churn	1 row(s) returned	0.000 sec / 0.000 sec
7	18:53:20	SELECT COUNT(*) AS total_customers, SUM(CASE WHEN CustomerStatus = 'Churned' THEN ...	1 row(s) returned	0.000 sec / 0.000 sec

By using this code we can able to identify the total number of customers in the telecom database in that, total churned customer data also find out and get the churn rate too.

- Total Customer = 4835
- Churned Customer = 1586
- Churned Rate = .032802

Identify the Churned customers avg monthly charges

SQL CODE

SELECT

contract,

AVG(monthlycharge) AS avg_monthly_charges

FROM

customer_churn

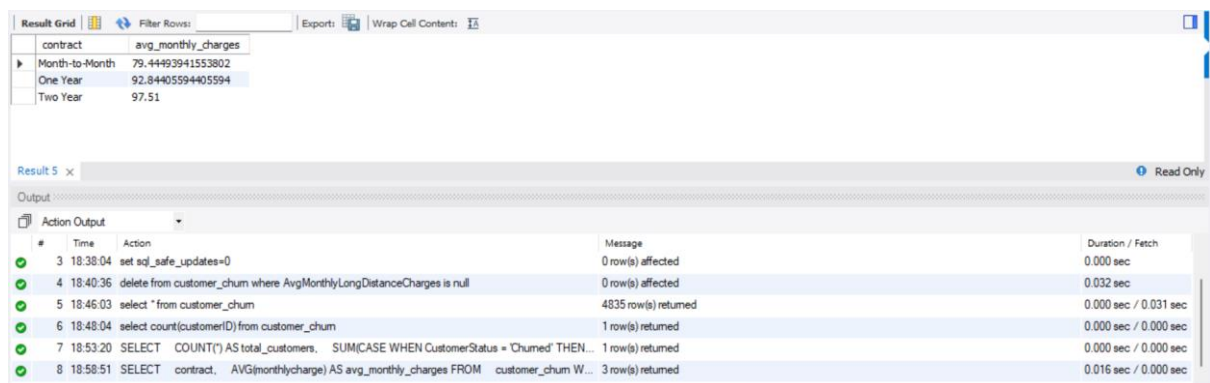
WHERE

CustomerStatus = 'Churned'

GROUP BY

contract;

OUTPUT:



	contract	avg_monthly_charges
Month-to-Month	79.44493941553802	
One Year	92.84405594405594	
Two Year	97.51	

#	Time	Action	Message	Duration / Fetch
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4	18:40:36	delete from customer_churn where AvgMonthlyLongDistanceCharges is null	0 row(s) affected	0.032 sec
5	18:46:03	select * from customer_churn	4835 row(s) returned	0.000 sec / 0.031 sec
6	18:48:04	select count(customerID) from customer_churn	1 row(s) returned	0.000 sec / 0.000 sec
7	18:53:20	SELECT COUNT(*) AS total_customers, SUM(CASE WHEN CustomerStatus = 'Churned' THEN...	1 row(s) returned	0.000 sec / 0.000 sec
8	18:58:51	SELECT contract, AVG(monthlycharge) AS avg_monthly_charges FROM customer_churn W...	3 row(s) returned	0.016 sec / 0.000 sec

By this code we can able to identify the avg monthly charges of churned customer for all types of contracts

- Month to Month
- One Year
- Two Year