

# TELECOM CUSTOMER CHURN ANALYSIS (POWER BI + SQL + MACHINE LEARNING)

## SQL QUERIES

### Data Exploration – Check Distinct Values

#### Select\*From Customer\_Data

```
-----  
SELECT Gender, Count(Gender) as TotalCount,  
Count(Gender) * 1.0 / (Select Count(*) from Customer_Data) as Percentage  
from Customer_Data  
Group by Gender  
-----
```

```
SELECT Contract, Count(Contract) as TotalCount,  
Count(Contract) * 1.0 / (Select Count(*) from Customer_Data) as Percentage  
from Customer_Data  
Group by Contract  
-----
```

```
SELECT Customer_Status, Count(Customer_Status) as TotalCount,  
Sum(Total_Revenue) as TotalRev,  
Sum(Total_Revenue) / (Select sum(Total_Revenue) from Customer_Data) * 100 as  
RevPercentage  
from Customer_Data  
Group by Customer_Status  
-----
```

```
SELECT State, Count(State) as TotalCount,  
Count(State) * 1.0 / (Select Count(*) from Customer_Data) as Percentage  
from Customer_Data  
Group by State  
Order by Percentage desc  
-----
```

```
Select Distinct Internet_Type  
  
From Customer_Data
```

### Data Exploration – Check Nulls

```
SELECT  
SUM(CASE WHEN Customer_ID IS NULL THEN 1 ELSE 0 END) AS  
Customer_ID_Null_Count,
```

SUM(CASE WHEN Gender IS NULL THEN 1 ELSE 0 END) AS  
 Gender\_Null\_Count,  
 SUM(CASE WHEN Age IS NULL THEN 1 ELSE 0 END) AS Age\_Null\_Count,  
 SUM(CASE WHEN Married IS NULL THEN 1 ELSE 0 END) AS  
 Married\_Null\_Count,  
 SUM(CASE WHEN State IS NULL THEN 1 ELSE 0 END) AS State\_Null\_Count,  
 SUM(CASE WHEN Number\_of\_Referrals IS NULL THEN 1 ELSE 0 END) AS  
 Number\_of\_Referrals\_Null\_Count,  
 SUM(CASE WHEN Tenure\_in\_Months IS NULL THEN 1 ELSE 0 END) AS  
 Tenure\_in\_Months\_Null\_Count,  
 SUM(CASE WHEN Value\_Deal IS NULL THEN 1 ELSE 0 END) AS  
 Value\_Deal\_Null\_Count,  
 SUM(CASE WHEN Phone\_Service IS NULL THEN 1 ELSE 0 END) AS  
 Phone\_Service\_Null\_Count,  
 SUM(CASE WHEN Multiple\_Lines IS NULL THEN 1 ELSE 0 END) AS  
 Multiple\_Lines\_Null\_Count,  
 SUM(CASE WHEN Internet\_Service IS NULL THEN 1 ELSE 0 END) AS  
 Internet\_Service\_Null\_Count,  
 SUM(CASE WHEN Internet\_Type IS NULL THEN 1 ELSE 0 END) AS  
 Internet\_Type\_Null\_Count,  
 SUM(CASE WHEN Online\_Security IS NULL THEN 1 ELSE 0 END) AS  
 Online\_Security\_Null\_Count,  
 SUM(CASE WHEN Online\_Backup IS NULL THEN 1 ELSE 0 END) AS  
 Online\_Backup\_Null\_Count,  
 SUM(CASE WHEN Device\_Protection\_Plan IS NULL THEN 1 ELSE 0 END) AS  
 Device\_Protection\_Plan\_Null\_Count,  
 SUM(CASE WHEN Premium\_Support IS NULL THEN 1 ELSE 0 END) AS  
 Premium\_Support\_Null\_Count,  
 SUM(CASE WHEN Streaming\_TV IS NULL THEN 1 ELSE 0 END) AS  
 Streaming\_TV\_Null\_Count,  
 SUM(CASE WHEN Streaming\_Movies IS NULL THEN 1 ELSE 0 END) AS  
 Streaming\_Movies\_Null\_Count,  
 SUM(CASE WHEN Streaming\_Music IS NULL THEN 1 ELSE 0 END) AS  
 Streaming\_Music\_Null\_Count,  
 SUM(CASE WHEN Unlimited\_Data IS NULL THEN 1 ELSE 0 END) AS  
 Unlimited\_Data\_Null\_Count,  
 SUM(CASE WHEN Contract IS NULL THEN 1 ELSE 0 END) AS  
 Contract\_Null\_Count,  
 SUM(CASE WHEN Paperless\_Billing IS NULL THEN 1 ELSE 0 END) AS  
 Paperless\_Billing\_Null\_Count,  
 SUM(CASE WHEN Payment\_Method IS NULL THEN 1 ELSE 0 END) AS  
 Payment\_Method\_Null\_Count,  
 SUM(CASE WHEN Monthly\_Charge IS NULL THEN 1 ELSE 0 END) AS  
 Monthly\_Charge\_Null\_Count,  
 SUM(CASE WHEN Total\_Charges IS NULL THEN 1 ELSE 0 END) AS  
 Total\_Charges\_Null\_Count,  
 SUM(CASE WHEN Total\_Refunds IS NULL THEN 1 ELSE 0 END) AS  
 Total\_Refunds\_Null\_Count,  
 SUM(CASE WHEN Total\_Extra\_Data\_Charges IS NULL THEN 1 ELSE 0 END)  
 AS Total\_Extra\_Data\_Charges\_Null\_Count,

```

SUM(CASE WHEN Total_Long_Distance_Charges IS NULL THEN 1 ELSE 0
END) AS Total_Long_Distance_Charges_Null_Count,
SUM(CASE WHEN Total_Revenue IS NULL THEN 1 ELSE 0 END) AS
Total_Revenue_Null_Count,
SUM(CASE WHEN Customer_Status IS NULL THEN 1 ELSE 0 END) AS
Customer_Status_Null_Count,
SUM(CASE WHEN Churn_Category IS NULL THEN 1 ELSE 0 END) AS
Churn_Category_Null_Count,
SUM(CASE WHEN Churn_Reason IS NULL THEN 1 ELSE 0 END) AS
Churn_Reason_Null_Count
FROM Customer_Data;

```

## Remove null and insert the new data into Prod table

```

SELECT
Customer_ID,
Gender,
Age,
Married,
State,
Number_of_Referrals,
Tenure_in_Months,
ISNULL(Value_Deal, 'None') AS Value_Deal,
Phone_Service,
ISNULL(Multiple_Lines, 'No') As Multiple_Lines,
Internet_Service,
ISNULL(Internet_Type, 'None') AS Internet_Type,
ISNULL(Online_Security, 'No') AS Online_Security,
ISNULL(Online_Backup, 'No') AS Online_Backup,
ISNULL(Device_Protection_Plan, 'No') AS Device_Protection_Plan,
ISNULL(Premium_Support, 'No') AS Premium_Support,
ISNULL(Streaming_TV, 'No') AS Streaming_TV,
ISNULL(Streaming_Movies, 'No') AS Streaming_Movies,
ISNULL(Streaming_Music, 'No') AS Streaming_Music,
ISNULL(Unlimited_Data, 'No') AS Unlimited_Data,
Contract,
Paperless_Billing,
Payment_Method,
Monthly_Charge,
Total_Charges,
Total_Refunds,
Total_Extra_Data_Charges,
Total_Long_Distance_Charges,
Total_Revenue,
Customer_Status,
ISNULL(Churn_Category, 'Others') AS Churn_Category,
ISNULL(Churn_Reason, 'Others') AS Churn_Reason
INTO [db_Churn].[dbo].[prod_Churn]
FROM [db_Churn].[dbo].[Customer_Data];

```

## Create View for Power BI

```
Create View vw_ChurnData as  
    select * from prod_Churn where Customer_Status In ('Churned', 'Stayed')
```

```
Create View vw_JoinData as  
    select * from prod_Churn where Customer_Status = 'Joined'
```