TELECOM INDUSTRY ANALYTICS

- Call Trend Analytics
- Customer Churn Analytics
- HR Diversion & Inclusion Analytics

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1 INTRODUCTION

This is a Virtual Internship Project from the Company PWC, in this project I will be helping the company to solve an important problem.

Fiddling around in Excel sheets just doesn't suit a digital jedi. The PwC's Digital Upskilling Academy helps people move from zero to digital hero. PwC is upskilling 284,000 people because the right digital skills make us agile, adaptable and fit for the future.

We use powerful Data Analytics tools to help solve business problems for our clients. Learning to master Power BI is a good first step. By empowering you to identify patterns, risks and opportunities in data, you will work more efficiently. You will be able to clearly visualise the value of data and turn it into convincing, actionable insights.

2 ABSTRACT OF THE PROJECT

Create a Dashboard in Power Bi for Visualizing relevant KPI's and Metrics in the Datasets provided.

Utilize the resources provided, including Podcasts and Articles, to enhance the understanding of Data Visualization and Upskilling.

Respond to the client requests by providing a well-designed Power Bi Dashboard reflecting to the KPI's.

3 PROGRAMMING / TOOLS USED

1) **SQL** - Microsoft SQL Server Management Studio.
2) **Data Visualization** - Microsoft Power Bi.

All the Queries for SQL and Data Analysis Expression for Power Bi, Related to the Tasks are Attached to Word files in the respective folders.

4 EXPLORATORY DATA ANALYSIS

Data analysis is the process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, informing conclusions, and supporting decision-making.

Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, and is used in different business, science, and social science domains.

In today's business world, data analysis plays a role in making decisions more scientific and helping businesses operate more effectively.

4.1. TASK 1: CALL TREND ANALYTICS

A) Dataset Overview:

The Telecom Industry fights hard for their customers. Our client needs help.

The Call Center Manager can’t see what the trends are. Our Dashboard should make everything clear.

The Abstract of the project is to create a Interactive Dashboard in Power Bi for the Call Center Manager to understand the Trends of the Dataset.

B) Key Perfromace Indicator Metrics:

1) Total Calls Received:
   Count of Total Call_Id.
2) Total Calls Answered:
   Count the values of Call_Id for Answered is Yes.
3) Total Calls Resolved:
   Count the values of Call_Id for Resolved is Yes.
4) Average Speed of Answer:
   Calculate the Average for the Speed of Answered in Seconds Column.
5) Average Satisfaction Rating:
   Calculate the Average for Satistication Rating.
6) Calls Answered & Abandoned:
   Calculate the Percentage of Calls Answered and Calls Abandoned by the Total Count of Call_Id.
7) Calls Resolved & Un-resolved:
   Calculate the Percentage of Calls Resolved and Un-Resolved by the Total Count of Call_Id.
8) Total Calls Received by Month (Answered Yes / No):
   Calculate the Total Calls Resolved or Unresolved on Average Talk Duration by Calls received.
9) Average Talk Duration by Calls Answered (Resolved Yes / No):
10) Filter by Topic:
   Filter the whole Analysis by Topic.
11) Filter by Agent:
   Filter the whole Analysis through Agent name.
12) Filter by Time Hours:
   Filter the Whole Analysis through Time Hour.

C) Exploratory Data Analysis:

SQL Queries:

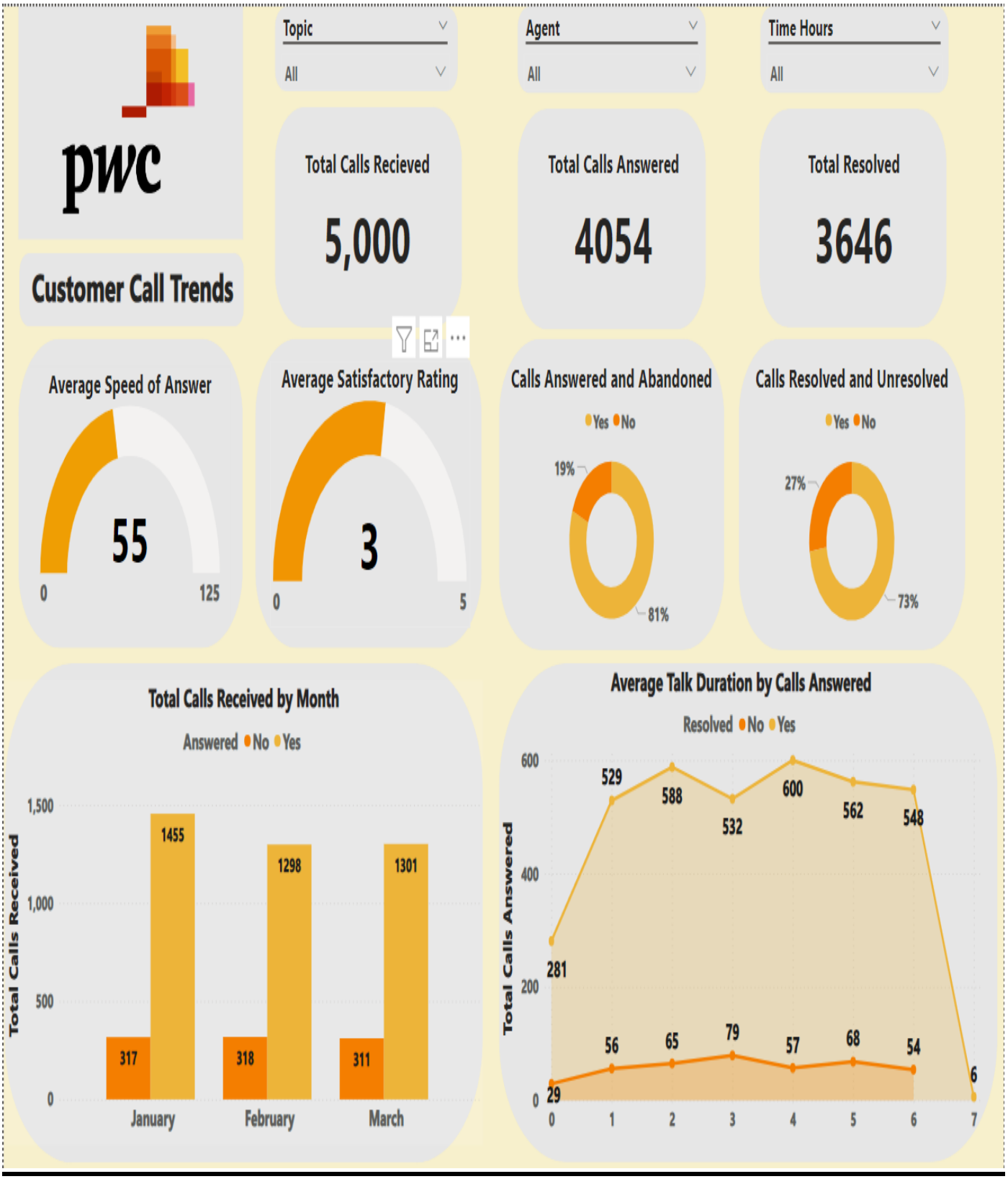
```
-- READ DATA
SELECT *
FROM PWC_DataAnalytics.dbo.CallCenterDataset

-------------------------------------------------------------------------

-- 1) Total Calls Recieved :

-- 1.1) Overall Calls Received :
SELECT COUNT(Call_Id) AS Total_Calls_Received
FROM PWC_DataAnalytics.dbo.CallCenterDataset

-- 1.2) Total Calls by Topic :
SELECT Topic, COUNT(Call_Id) AS Total_Calls_Received
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Topic

-- 1.3) Total Calls by Agent :
SELECT Agent, COUNT(Call_Id) AS Total_Calls_Received
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Agent

-- 1.4) Total Calls by Hour :
SELECT DATEPART(HOUR, Time) AS DataHour, COUNT(Call_Id) AS Total_Calls_Received
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY DATEPART(HOUR, Time)

-------------------------------------------------------------------------

-- 2) Total Calls Answered :

-- 2.1) Overall Calls Answered

SELECT COUNT(Answered_Y_N) AS Total_Calls_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Answered_Y_N = 1

-- 2.2) Total Calls Answered by Topic :
SELECT Topic, COUNT(Answered_Y_N) AS Total_Calls_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Answered_Y_N = 1
GROUP BY Topic

-- 2.3) Total Calls Answered by Agent :
SELECT Agent, COUNT(Answered_Y_N) AS Total_Calls_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Answered_Y_N = 1
GROUP BY Agent

-- 2.4) Total Calls Answered by Hour :
SELECT DATEPART(HOUR, Time) AS DataHour, COUNT(Answered_Y_N) AS Total_Calls_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Answered_Y_N = 1
GROUP BY DATEPART(HOUR, Time)
```

```sql
-----------------------------------------------------------------------

-- 3) Total Calls Resolved :

-- 3.1) Overall Calls Resolved :
SELECT COUNT(Resolved) AS Total_Calls_Resolved
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Resolved = 1

-- 3.2) Total Calls Resolved by Topic :
SELECT Topic, COUNT(Resolved) AS Total_Calls_Resolved
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Resolved = 1
GROUP BY Topic

-- 3.3) Total Calls Resolved by Agent :
SELECT Agent, COUNT(Resolved) AS Total_Calls_Resolved
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Resolved = 1
GROUP BY Agent

-- 3.4) Total Calls Resolved by Hour :
SELECT DATEPART(HOUR, Time) AS DataHour, COUNT(Resolved) AS Total_Calls_Resolved
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE Resolved = 1
GROUP BY DATEPART(HOUR, Time)

-----------------------------------------------------------------------

-- 4) Speed of Answer :

-- 4.1) Average Speed of Answer :

SELECT AVG(ISNULL(Speed_of_answer_in_seconds, 0)) AS Average_Speed_Of_Call_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset

-- 4.2) Average Speed of Answer by Topic :
SELECT Topic, AVG(ISNULL(Speed_of_answer_in_seconds, 0)) AS Average_Speed_Of_Call_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Topic

-- 4.3) Average Speed of Answer by Agent :
SELECT Agent, AVG(ISNULL(Speed_of_answer_in_seconds, 0)) AS Average_Speed_Of_Call_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Agent

-- 4.4) Average Speed of Answer by Hour :
SELECT DATEPART(HOUR, Time) AS DataHour, AVG(ISNULL(Speed_of_answer_in_seconds, 0)) AS
Average_Speed_Of_Call_Answered
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY DATEPART(HOUR, Time)

-----------------------------------------------------------------------

-- 5) Satisfactory Rating :

-- 5.1) Average Satisfactory Rating :
SELECT AVG(ISNULL(Satisfaction_rating, 0)) AS Average_Satisfactory_Rating
```

```sql
FROM PWC_DataAnalytics.dbo.CallCenterDataset

-- 5.2) Average Satisfactory Rating by Topic:
SELECT Topic, AVG(ISNULL(Satisfaction_rating, 0)) AS Average_Satisfactory_Rating
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Topic

-- 5.3) Average Satisfactory Rating by Agent:
SELECT Agent, AVG(ISNULL(Satisfaction_rating, 0)) AS Average_Satisfactory_Rating
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Agent

-- 5.4) Average Satisfactory Rating by Hour:
SELECT DATEPART(HOUR, Time) AS DataHour, AVG(ISNULL(Satisfaction_rating, 0)) AS
Average_Satisfactory_Rating
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY DATEPART(HOUR, Time)

-----------------------------------------------------------------------

-- 6.A) Ratio Calls Answered and Abandoned :
SELECT COUNT(Call_Id) AS Calls_Received,
       CASE WHEN Answered_Y_N = 1 THEN 'Yes' ELSE 'No' END AS Calls_Answered_and_Abandoned
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Answered_Y_N

-- 6.B) Percentage of Calls Answered and Abandoned :
SELECT
      CEILING(SUM(CASE WHEN Answered_Y_N = 1 THEN 1 ELSE 0 END) * 100 / COUNT(Call_Id)) AS
Percentage_Calls_Answered,
         CEILING(SUM(CASE WHEN Answered_Y_N = 0 THEN 1 ELSE 0 END) * 100 / COUNT(Call_Id)) AS
Percentage_Calls_Abandoned
FROM PWC_DataAnalytics.dbo.CallCenterDataset

-----------------------------------------------------------------------

-- 7.A) Ratio of Calls Resolved and Unresolved :
SELECT COUNT(Call_Id) AS Calls_Received,
       CASE WHEN Resolved = 1 THEN 'Yes' ELSE 'No' END AS Calls_Resolved_and_Unresolved
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY Resolved

-- 7.B) Percentage of Calls Resolved and Unresolved :
SELECT
      CEILING(SUM(CASE WHEN Resolved = 1 THEN 1 ELSE 0 END) * 100 / COUNT(Call_Id)) AS
Percentage_Calls_Answered,
         CEILING(SUM(CASE WHEN Resolved = 0 THEN 1 ELSE 0 END) * 100 / COUNT(Call_Id)) AS
Percentage_Calls_Abandoned
FROM PWC_DataAnalytics.dbo.CallCenterDataset

-----------------------------------------------------------------------

-- Total Calls Received by Months vs Answered and Abandoned :
SELECT
      (CASE WHEN MONTH(Date) = 1 THEN 'Jan'
            WHEN MONTH(Date) = 2 THEN 'Feb'
               WHEN MONTH(Date) = 3 THEN 'Mar'
               ELSE NULL
               END) AS Months,
```

```
        COUNT(Call_ID) AS Total_Calls_Received,
        SUM(CASE WHEN Answered_Y_N = 1 THEN 1 ELSE 0 END) AS Calls_Answered,
        SUM(CASE WHEN Answered_Y_N = 0 THEN 1 ELSE 0 END) AS Calls_Abandoned
FROM PWC_DataAnalytics.dbo.CallCenterDataset
GROUP BY MONTH(Date)

-------------------------------------------------------------------------

-- Average Talk Duration in Minutes by Calls Answered vs Resolved and Unresolved :
SELECT DATEPART(MINUTE, AvgTalkDuration) AS Avg_Mins,
       SUM(CASE WHEN Answered_Y_N = 1 THEN 1 ELSE 0 END) AS Calls_Answered,
          SUM(CASE WHEN Resolved = 1 THEN 1 ELSE 0 END) AS Resolved,
          SUM(CASE WHEN Resolved = 0 THEN 1 ELSE 0 END) AS Unresolved
FROM PWC_DataAnalytics.dbo.CallCenterDataset
WHERE AvgTalkDuration IS NOT NULL
GROUP BY DATEPART(MINUTE, AvgTalkDuration)
```

D) Conclusions: Final Dashboard



4.2. TASK 2: CHURN ANALYTICS

A) Dataset Overview:

To build a Dashboard that provides recommendations regarding customer retention. In addition, to better understand the data, the telecom Retention

Manager has scheduled a meeting with the engagement partner at PwC to cover these points:

- Customers in the telecom industry are hard-earned: we don't want to lose them
- The retention department is here to get customers back in case of termination
- Currently, we get in touch after they have terminated the contract, but this is reactionary: it would be better to know in advance who is at risk
- We have done customer analysis with Excel: it has always ended in a dead-end
- We would like to know more about our customers: visualised clearly so that it's self-explanatory for our management

The Retentions Manager has provided some information in the resources.

Define proper KPIs

Create a dashboard for the retention manager reflecting the KPIs

Write a short email to him (the engagement partner) explaining your findings, and include suggestions as to what needs to be changed.

B) Key Performace Indicator Metrics:

1) Total Customers
2) Churn Rate
3) Total Admin Tickets
4) Total Tech Tickets
5) Average Monthly Charges
6) Total Revenue
7) Customers by Gender (female/male)
8) Revenue by Gender (female/male)
9) Male Count
10) Male Revenue Rate
11) Female Count
12) Female Revenue Rate
13) Customers by Senior Citizen (yes/no)
14) Revenue by Senior Citizen (yes/no)
15) Senior Citizen Count
16) Senior Citizen Revenue Rate
17) Customers by Partners (yes/no)
18) Revenue by Partners (yes/no)
19) Partner Count
20) Partner Revenue Rate
21) Customers by Dependents (yes/no)

22) Revenue by Dependents (yes/no)

23) Dependent Count

24) Dependent Revenue Rate

25) Customer by Phone Service

26) Phone Service Customer Rate

27) Revenue by Phone Service

28) Phone Service Revenue Rate

29) Customer by Internet Service

30) Fiber Optic Customer Rate

31) DSL Customer Rate

32) Revenue by Internet Service

33) Fiber Optic Revenue Rate

34) DSL Revenue Rate

35) Customer by Multiple Lines

36) Revenue by Multiple Lines

37) Multiple lines Customer Rate

38) Multiple Lines Revenue Rate

39) Customer by Streaming TVs

40) Revenue by Streaming TVs

41) Streaming TVs Customer Rate

42) Streaming TVs Rvenue Rate

43) Customer by Streaming Movies

44) Revenue by Streaming Movies

45) Streaming Movies Customer Rate

46) Streaming Movies Revenue Rate

47) Customer by Online Security

48) Revenue by Online Security

49) Online Security Customer Rate

50) Online Security Revenue Rate

51) Customer by Online Backup

52) Revenue by Online Backup

53) Online Backup Customer Rate

54) Online Backup Revenue Rate

55) Customer by Device Protection

56) Revenue by Device Protection

57) Device Protection Customer Rate

58) Device Protection Revenue Rate

59) Customers by tech Support

60) Revenue by Tech Support

61) Tech Support Customer Rate

62) Tech Support Revenue Rate

63) Customers by Paperless Billing

64) Customers by Contract Type

65) Customers by Payment Method

66) Revenue by Payment Method

67) Total Revenue by Contract Type

68) Customer List

69) Filters of Tenure Year

70) Filters of Churn (Yes/No)

C) Exploratory Data Analysis:

SQL Queries:

```
-- RETRIEVE DATA :

SELECT *
FROM PWC_DataAnalytics.dbo.ChurnDataset

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-------------------------------------------------------

-- DATA TRANSFORMATION or DATA CLEANING :

-- 1) COLUMN TENURE FROM VARCHAR TO INT :
ALTER TABLE ChurnDataset
ALTER COLUMN tenure INT;

-- 2) COLUMN SENIOR CITIZEN FROM VARCHAR TO INT :
ALTER TABLE ChurnDataset
ALTER COLUMN SeniorCitizen INT;

-- 3) COLUMN NUM ADMIN TICKETS FROM VARCHAR TO INT :
ALTER TABLE ChurnDataset
ALTER COLUMN numAdminTickets INT;

-- 4) COLUMN NUM TECH TICKETS FROM VARCHAR TO INT :
ALTER TABLE ChurnDataset
ALTER COLUMN numTEchTickets INT;

-- 5) COLUMN MONTHLY CHARGES FROM VARCHAR TO FLOAT :
ALTER TABLE ChurnDataset
ALTER COLUMN MonthlyCharges FLOAT;

-- 6) COLUMN TOTAL CHARGES FROM VARCHAR TO FLOAT :
ALTER TABLE ChurnDataset
ALTER COLUMN TotalCharges FLOAT;

-- B) TRANSFORMING TENURE MONTH TO YEARS IN NEW COLUMN :
ALTER TABLE PWC_DataAnalytics.dbo.ChurnDataset
ADD tenure_years VARCHAR(50);

UPDATE PWC_DataAnalytics.dbo.ChurnDataset
SET tenure_years = tenure

UPDATE PWC_DataAnalytics.dbo.ChurnDataset
SET tenure_years =
                  CASE WHEN tenure_years <= 1 THEN 'Within 1 Month'
                                        WHEN tenure_years > 1 AND tenure_years <= 12 THEN '0-
1 Year'
                                        WHEN tenure_years > 12 AND tenure_years <= 24 THEN
'1-2 Year'
                                        WHEN tenure_years > 24 AND tenure_years <= 36 THEN
'2-3 Year'
                                        WHEN tenure_years > 36 AND tenure_years <= 48 THEN
'3-4 Year'
```

```
                                        WHEN tenure_years > 48 AND tenure_years <= 60 THEN
'4-5 Year'
                                        WHEN tenure_years > 60 AND tenure_years <= 72 THEN
'5-6 Year'
                                        ELSE 'Greater than 6 Year'
                                END


SELECT *
FROM PWC_DataAnalytics.dbo.ChurnDataset

-------------------------------------------------------------------------------------------------
-----------------------------------------------------

-- ANALYSIS :

SELECT *
FROM PWC_DataAnalytics.dbo.ChurnDataset;

-- 1) SUMMARY ANALYSIS :

-- 1.1) TOTAL CUSTOMER COUNT :
SELECT COUNT(customerID) AS Total_Customer_Count
FROM PWC_DataAnalytics.dbo.ChurnDataset;

-- 1.1.1) CUSTOMER COUNT BY CHURN :
SELECT COUNT(customerID) AS Churn_Customer_Count
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes';

-- 1.1.2) CUSTOMER COUNT BY TENURE :
SELECT tenure_years, COUNT(customerID) AS Churn_Customer_Count
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY tenure_years;

-------------------------------------------------------------------------------

-- 1.2) CHURN RATE :
SELECT
       (COUNT(CASE WHEN Churn = 'Yes' THEN customerID ELSE NULL END) * 100) / (SELECT
COUNT(DISTINCT customerID) FROM PWC_DataAnalytics.dbo.ChurnDataset) AS Churn_Rate
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes';

-- 1.2.1) CHURN RATE BY TENURE :
SELECT
       tenure_years,
       (SUM(CASE WHEN Churn = 'Yes' THEN 1 ELSE 0 END)) * 100 / COUNT(DISTINCT customerID) AS
Churn_Rate
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY tenure_years;

-------------------------------------------------------------------------------

-- 1.3) TOTAL ADMIN TICKETS :
SELECT
       SUM(numAdminTickets) AS Total_Admin_Tickets
```

```
FROM PWC_DataAnalytics.dbo.ChurnDataset;

-- 1.3.1) TOTAL ADMIN TICKETS BY CHURN :
SELECT
       Churn,
       SUM(CASE WHEN Churn = 'Yes' THEN numAdminTickets
              WHEN Churn = 'No' THEN numAdminTickets ELSE NULL END) AS
Total_Admin_Tickets_by_Churn
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes' OR Churn = 'No'
GROUP BY Churn;

-- 1.3.2) TOTAL ADMIN TICKETS BY TENURE :
SELECT
       tenure_years,
       SUM(numAdminTickets) AS Total_Admin_Tickets_by_Tenure
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY tenure_years;

-------------------------------------------------------------------------

-- 1.4) TOTAL TECH TICKETS :
SELECT
       SUM(numTechTickets) AS Total_Tech_Tickets
FROM PWC_DataAnalytics.dbo.ChurnDataset;

-- 1.4.1) TOTAL TECH TICKETS BY CHURN :
SELECT
       Churn,
       SUM(CASE WHEN Churn = 'Yes' THEN numTechTickets
              WHEN Churn = 'No' THEN numTechTickets
              ELSE NULL END) AS Total_Tech_Tickets_by_Churn
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes' OR Churn = 'No'
GROUP BY Churn;

-- 1.4.2) TOTAL TECH TICKETS BY TENURE :
SELECT
       tenure_years,
       SUM(numTechTickets) AS Total_Tech_Tickets_by_Tenure
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY tenure_years;

-------------------------------------------------------------------------

-- 1.5) AVERAGE MONTHLY CHARGE :
SELECT ROUND(AVG(MonthlyCharges), 1) AS Average_Monthly_Charges
FROM PWC_DataAnalytics.dbo.ChurnDataset;

-- 1.5.1) AVERAGE MONTHLY CHARGE BY CHURN :
SELECT
       Churn,
       ROUND(AVG(CASE WHEN Churn = 'Yes' THEN MonthlyCharges
                           WHEN Churn = 'No' THEN MonthlyCharges
                           ELSE NULL END), 1) AS Average_Monthly_Charges_by_Churn
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes' OR Churn = 'No'
GROUP BY Churn;
```

```
-- 1.5.2) AVERAGE MONTHLY CHARGE BY TENURE :
SELECT
	tenure_years,
	ROUND(AVG(MonthlyCharges), 1) AS Average_Monthly_Charges_by_Tenure
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY tenure_years;

-------------------------------------------------------------------------

-- 1.6) TOTAL REVENUE :
SELECT
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset;

-- 1.6.1) TOTAL REVENUE BY CHURN :
SELECT
	Churn,
	SUM(CASE WHEN Churn = 'Yes' THEN TotalCharges
			 WHEN Churn = 'No' THEN TotalCharges
			 ELSE NULL END) AS Total_Revenue_by_Churn
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes' OR Churn = 'No'
GROUP BY Churn;

-- 1.6.2) TOTAL REVENUE BY TENURE :
SELECT
	tenure_years,
	SUM(TotalCharges) AS Total_Revenue_by_Tenure
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY tenure_years;

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-----------------------------------------------------

-- 2) CUSTOMER DEMOGRAPHIC SEGMENT :

-- CUSTOMER BY GENDER :
SELECT
	gender,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY gender;

-- PERCENT :
SELECT
	gender,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY gender;

-- CHURN BY CUSTOMER vs GENDER :
SELECT
	gender,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY gender;
```

```
-- CHURN RATE BY CUSTOMER vs GENDER :
SELECT
	gender,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY gender;

-- REVENUE BY GENDER :
SELECT
	gender,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY gender;

--PERCENTAGE :
SELECT
	gender,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY gender;

-- CHURN BY REVENUE vs GENDER :
SELECT
	gender,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY gender;

-- CHURN RATE BY REVENUE vs GENDER :
SELECT
	gender,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY gender;

------------------------------------------------------------------------

-- CUSTOMER BY SENIOR CITIZEN :
SELECT
	SeniorCitizen,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY SeniorCitizen;

-- PERCENT :
SELECT
	SeniorCitizen,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY SeniorCitizen;

-- CHURN BY CUSTOMER vs SENIOR CITIZEN :
```

```
SELECT
	SeniorCitizen,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY SeniorCitizen;

-- CHURN RATE BY CUSTOMER vs SENIOR CITIZEN :
SELECT
	SeniorCitizen,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY SeniorCitizen;

-- REVENUE BY SENIOR CITIZEN :
SELECT
	SeniorCitizen,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY SeniorCitizen;

--PERCENTAGE :
SELECT
	SeniorCitizen,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY SeniorCitizen;

-- CHURN BY REVENUE vs SENIOR CITIZEN :
SELECT
	SeniorCitizen,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY SeniorCitizen;

-- CHURN RATE BY REVENUE vs SENIOR CITIZEN :
SELECT
	SeniorCitizen,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY SeniorCitizen;
--------------------------------------------------------------------------

-- CUSTOMER BY DEPENDENTS :
SELECT
	Dependents,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Dependents;

-- PERCENT :
SELECT
	Dependents,
```

```
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Dependents;

-- CHURN BY CUSTOMER vs DEPENDENTS :
SELECT
	Dependents,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Dependents;

-- CHURN RATE BY CUSTOMER vs DEPENDENTS :
SELECT
	Dependents,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Dependents;

-- REVENUE BY DEPENDENTS :
SELECT
	Dependents,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Dependents;

--PERCENTAGE :
SELECT
	Dependents,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Dependents;

-- CHURN BY REVENUE vs DEPENDENTS :
SELECT
	Dependents,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Dependents;

-- CHURN RATE BY REVENUE vs DEPENDENTS :
SELECT
	Dependents,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Dependents;

-----------------------------------------------------------------------------

-- CUSTOMER BY PARTNER :
SELECT
	Partner,
```

```
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Partner;

-- PERCENT :
SELECT
	Partner,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Partner;

-- CHURN BY CUSTOMER vs PARTNER :
SELECT
	Partner,
	COUNT(DISTINCT customerID) AS Total_Customer_Id
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Partner;

-- CHURN RATE BY CUSTOMER vs PARTNERS :
SELECT
	Partner,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Partner;

-- REVENUE BY PARTNER :
SELECT
	Partner,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Partner;

--PERCENTAGE :
SELECT
	Partner,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Partner;

-- CHURN BY REVENUE vs PARTNER :
SELECT
	Partner,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Partner;

-- CHURN RATE BY REVENUE vs PARTNERS
SELECT
	Partner,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
```

```
GROUP BY Partner;

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-----------------------------------------------------

-- 3) SERVICE SEGMENT ANALYSIS :

-- CUSTOMER BY PHONE SERVICE :
SELECT
	PhoneService,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PhoneService;

-- PERCENT :
SELECT
	PhoneService,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PhoneService;

-- CHURN BY CUSTOMER vs PHONE SERVICE :
SELECT
	PhoneService,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PhoneService;

-- CHURN RATE BY CUSTOMER vs PHONE SERVICE :
SELECT
	PhoneService,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PhoneService;

-- REVENUE BY PHONE SERVICE :
SELECT
	PhoneService,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PhoneService;

--PERCENTAGE :
SELECT
	PhoneService,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PhoneService;

-- CHURN BY REVENUE vs PHONE SERVICE :
SELECT
	PhoneService,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
```

```
WHERE Churn = 'Yes'
GROUP BY PhoneService;

-- CHURN RATE BY REVENUE vs PHONE SERVICE :
SELECT
	PhoneService,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PhoneService;

--------------------------------------------------------------------------

-- CUSTOMER BY INTERNET SERVICE :
SELECT
	InternetService,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY InternetService;

-- PERCENT :
SELECT
	InternetService,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY InternetService;

-- CHURN BY CUSTOMER vs INTERNET SERVICE :
SELECT
	InternetService,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY InternetService;

-- CHURN RATE BY CUSTOMER vs INTERNET SERVICE :
SELECT
	InternetService,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY InternetService;

-- REVENUE BY INTERNET SERVICE :
SELECT
	InternetService,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY InternetService;

--PERCENTAGE :
SELECT
	InternetService,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
```

```
GROUP BY InternetService;

-- CHURN BY REVENUE vs INTERNET SERVICE :
SELECT
	InternetService,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY InternetService;

-- CHURN RATE BY REVENUE vs INTERNET SERVICE :
SELECT
	InternetService,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY InternetService;

--------------------------------------------------------------------------

-- CUSTOMER BY MULTIPLE LINES :
SELECT
	MultipleLines,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY MultipleLines;

-- PERCENT :
SELECT
	MultipleLines,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY MultipleLines;

-- CHURN BY CUSTOMER vs MULTIPLE LINES :
SELECT
	MultipleLines,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY MultipleLines;

-- CHURN RATE BY CUSTOMERS vs MULTIPLE LINES :
SELECT
	MultipleLines,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY MultipleLines;

-- REVENUE BY MULTIPLE LINES :
SELECT
	MultipleLines,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY MultipleLines;
```

```
--PERCENTAGE :
SELECT
	MultipleLines,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY MultipleLines;

-- CHURN BY REVENUE vs MULTIPLE LINES :
SELECT
	MultipleLines,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY MultipleLines;

-- CHURN RATE BY REVENUE vs MULTIPLE LINES :
SELECT
	MultipleLines,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY MultipleLines;

--------------------------------------------------------------------------

-- CUSTOMER BY STREAMING TVs :
SELECT
	StreamingTV,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingTV;

-- PERCENT :
SELECT
	StreamingTV,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingTV;

-- CHURN BY CUSTOMER vs STREAMING TVs :
SELECT
	StreamingTV,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingTV;

-- CHURN RATE BY CUSTOMERS vs STREAMING TVs :
SELECT
	StreamingTV,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingTV;
```

```
-- REVENUE BY STREAMING TVs :
SELECT
	StreamingTV,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingTV;

--PERCENTAGE :
SELECT
	StreamingTV,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingTV;

-- CHURN BY REVENUE vs STREAMING TVs :
SELECT
	StreamingTV,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingTV;

-- CHURN RATE BY REVENUE vs STREAMING TVs :
SELECT
	StreamingTV,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingTV;

------------------------------------------------------------------------

-- CUSTOMER BY STREAMING MOVIES :
SELECT
	StreamingMovies,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingMovies;

-- PERCENT :
SELECT
	StreamingMovies,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingMovies;

-- CHURN BY CUSTOMER vs STREAMING MOVIES :
SELECT
	StreamingMovies,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingMovies;

-- CHURN RATE BY CUSTOMERS vs STREAMING MOVIES :
```

```
SELECT
	StreamingMovies,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingMovies;

-- REVENUE BY STREAMING MOVIES :
SELECT
	StreamingMovies,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingMovies;

--PERCENTAGE :
SELECT
	StreamingMovies,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY StreamingMovies;

-- CHURN BY REVENUE vs STREAMING MOVIES :
SELECT
	StreamingMovies,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingMovies;

-- CHURN RATE BY REVENUE vs STREAMING MOVIES :
SELECT
	StreamingMovies,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY StreamingMovies;

-------------------------------------------------------------------------

-- CUSTOMER BY ONLINE SECURITY :
SELECT
	OnlineSecurity,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineSecurity;

-- PERCENT :
SELECT
	OnlineSecurity,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineSecurity;

-- CHURN BY CUSTOMER vs ONLINE SECURITY :
SELECT
```

```
	OnlineSecurity,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineSecurity;

-- CHURN RATE BY CUSTOMERS vs ONLINE SECURITY :
SELECT
	OnlineSecurity,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineSecurity;

-- REVENUE BY ONLINE SECURITY :
SELECT
	OnlineSecurity,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineSecurity;

--PERCENTAGE :
SELECT
	OnlineSecurity,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineSecurity;

-- CHURN BY REVENUE vs ONLINE SECURITY :
SELECT
	OnlineSecurity,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineSecurity;

-- CHURN RATE BY REVENUE vs ONLINE SECURITY :
SELECT
	OnlineSecurity,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineSecurity;

-------------------------------------------------------------------------

-- CUSTOMER BY ONLINE BACKUP :
SELECT
	OnlineBackup,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineBackup;

-- PERCENT :
SELECT
	OnlineBackup,
```

```
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineBackup;

-- CHURN BY CUSTOMER vs ONLINE BACKUP :
SELECT
	OnlineBackup,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineBackup;

-- CHURN RATE BY CUSTOMERS vs ONLINE BACKUP :
SELECT
	OnlineBackup,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineBackup;

-- REVENUE BY ONLINE SECURITY :
SELECT
	OnlineBackup,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineBackup;

--PERCENTAGE :
SELECT
	OnlineBackup,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY OnlineBackup;

-- CHURN BY REVENUE vs ONLINE BACKUP :
SELECT
	OnlineBackup,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineBackup;

-- CHURN RATE BY REVENUE vs ONLINE BACKUP :
SELECT
	OnlineBackup,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY OnlineBackup;

--------------------------------------------------------------------------

-- CUSTOMER BY DEVICE PROTECTION :
SELECT
	DeviceProtection,
```

```
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY DeviceProtection;

-- PERCENT :
SELECT
	DeviceProtection,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY DeviceProtection;

-- CHURN BY CUSTOMER vs DEVICE PROTECTION :
SELECT
	DeviceProtection,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY DeviceProtection;

-- CHURN RATE BY CUSTOMERS vs DEVICE PROTECTION :
SELECT
	DeviceProtection,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY DeviceProtection;

-- REVENUE BY DEVICE PROTECTION :
SELECT
	DeviceProtection,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY DeviceProtection;

--PERCENTAGE :
SELECT
	DeviceProtection,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY DeviceProtection;

-- CHURN BY REVENUE vs DEVICE PROTECTION :
SELECT
	DeviceProtection,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY DeviceProtection;

-- CHURN RATE BY REVENUE vs DEVICE PROTECTION :
SELECT
	DeviceProtection,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
```

```
GROUP BY DeviceProtection;

-----------------------------------------------------------------------

-- CUSTOMER BY TECH SUPPORT :
SELECT
	TechSupport,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY TechSupport;

-- PERCENT :
SELECT
	TechSupport,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY TechSupport;

-- CHURN BY CUSTOMER vs TECH SUPPORT :
SELECT
	TechSupport,
	COUNT(customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY TechSupport;

-- CHURN RATE BY CUSTOMERS vs TECH SUPPORT :
SELECT
	TechSupport,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY TechSupport;

-- REVENUE BY TECH SUPPORT :
SELECT
	TechSupport,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY TechSupport;

--PERCENTAGE :
SELECT
	TechSupport,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY TechSupport;

-- CHURN BY REVENUE vs TECH SUPPORT :
SELECT
	TechSupport,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY TechSupport;
```

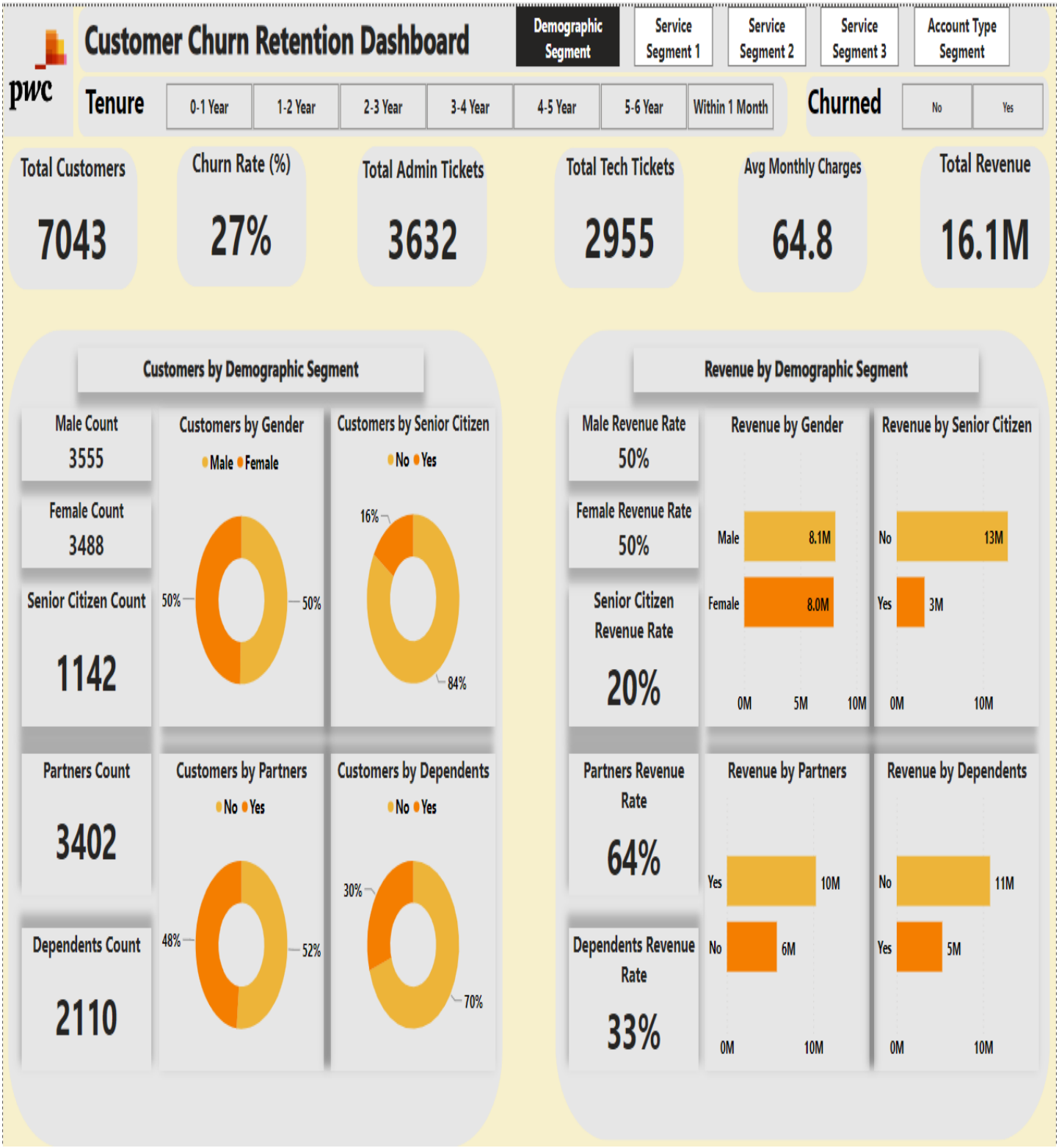
```
-- CHURN RATE BY REVENUE vs TECH SUPPORT :
SELECT
	TechSupport,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY TechSupport;
-------------------------------------------------------------------------------------------------
-----------------------------------------------------
-- 4) ACCOUNT TYPE SEGMENT :

-- CUSTOMER BY PAPERLESS BILLING
SELECT
	PaperlessBilling,
	COUNT(DISTINCT customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaperlessBilling;

-- PERCENT :
SELECT
	PaperlessBilling,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaperlessBilling;

-- CUSTOMER BY PAPERLESS BILLING vs CHURN
SELECT
	PaperlessBilling,
	COUNT(DISTINCT customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaperlessBilling;

-- CHURN RATE BY CUSTOMERS vs PAPERLESS BILLING :
SELECT
	PaperlessBilling,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaperlessBilling;

-- REVENUE BY PAPERLESS BILLING :
SELECT
	PaperlessBilling,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaperlessBilling;

--PERCENTAGE :
SELECT
	PaperlessBilling,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaperlessBilling;
```

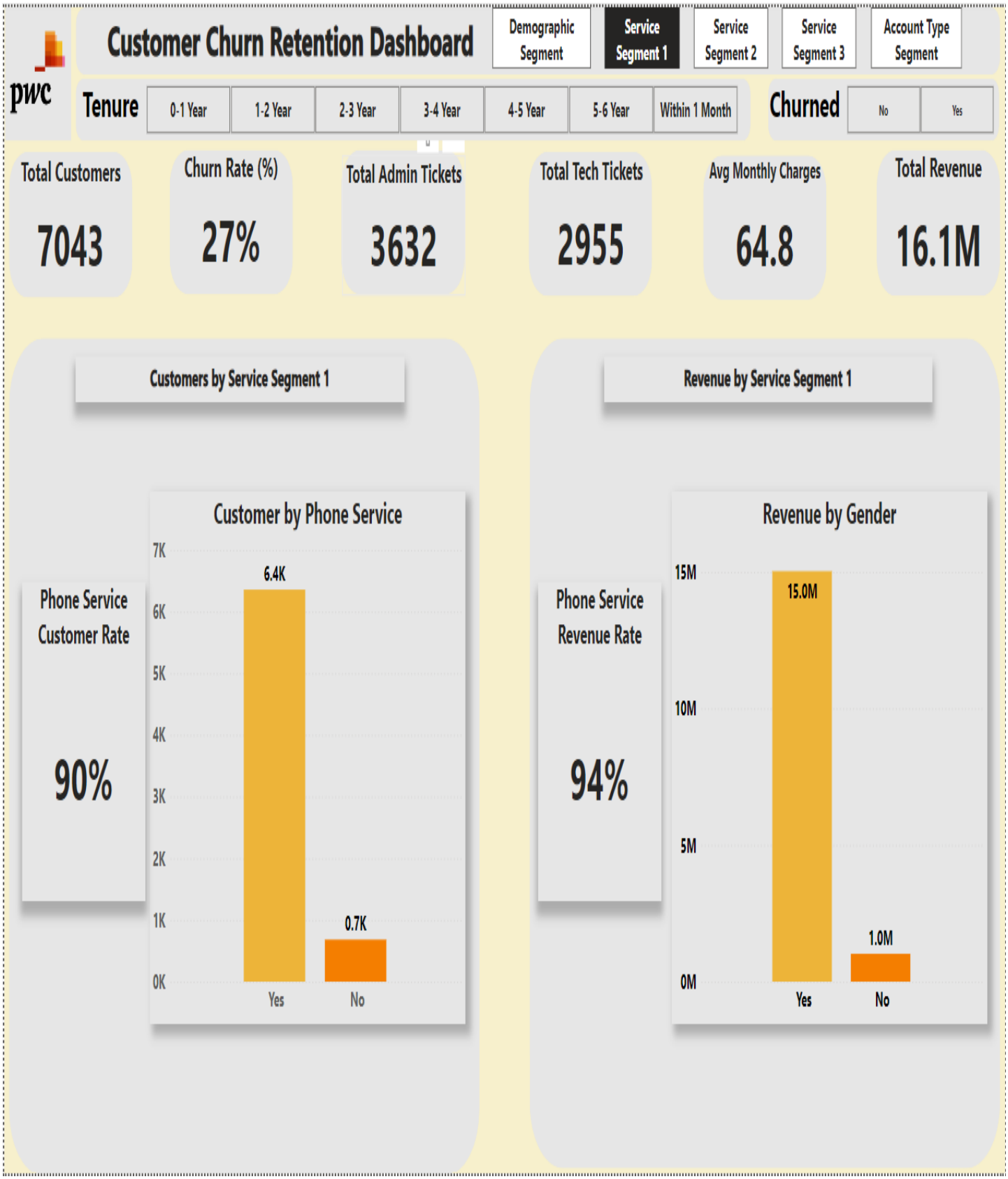
```
-- REVENUE BY PAPERLESS BILLING vs CHURN:
SELECT
	PaperlessBilling,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaperlessBilling;

-- CHURN RATE BY REVENUE vs PAPERLESS BILLING :
SELECT
	PaperlessBilling,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaperlessBilling;

-------------------------------------------------------------------------

-- CUSTOMER BY CONTRACT
SELECT
	Contract,
	COUNT(DISTINCT customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Contract;

-- PERCENT :
SELECT
	Contract,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Contract;

-- CUSTOMER BY CONTRACT vs CHURN
SELECT
	Contract,
	COUNT(DISTINCT customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Contract;

-- CHURN RATE BY CUSTOMERS vs CONTRACT :
SELECT
	Contract,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Contract;

-- REVENUE BY CONTRACT :
SELECT
	Contract,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Contract;

--PERCENTAGE :
```

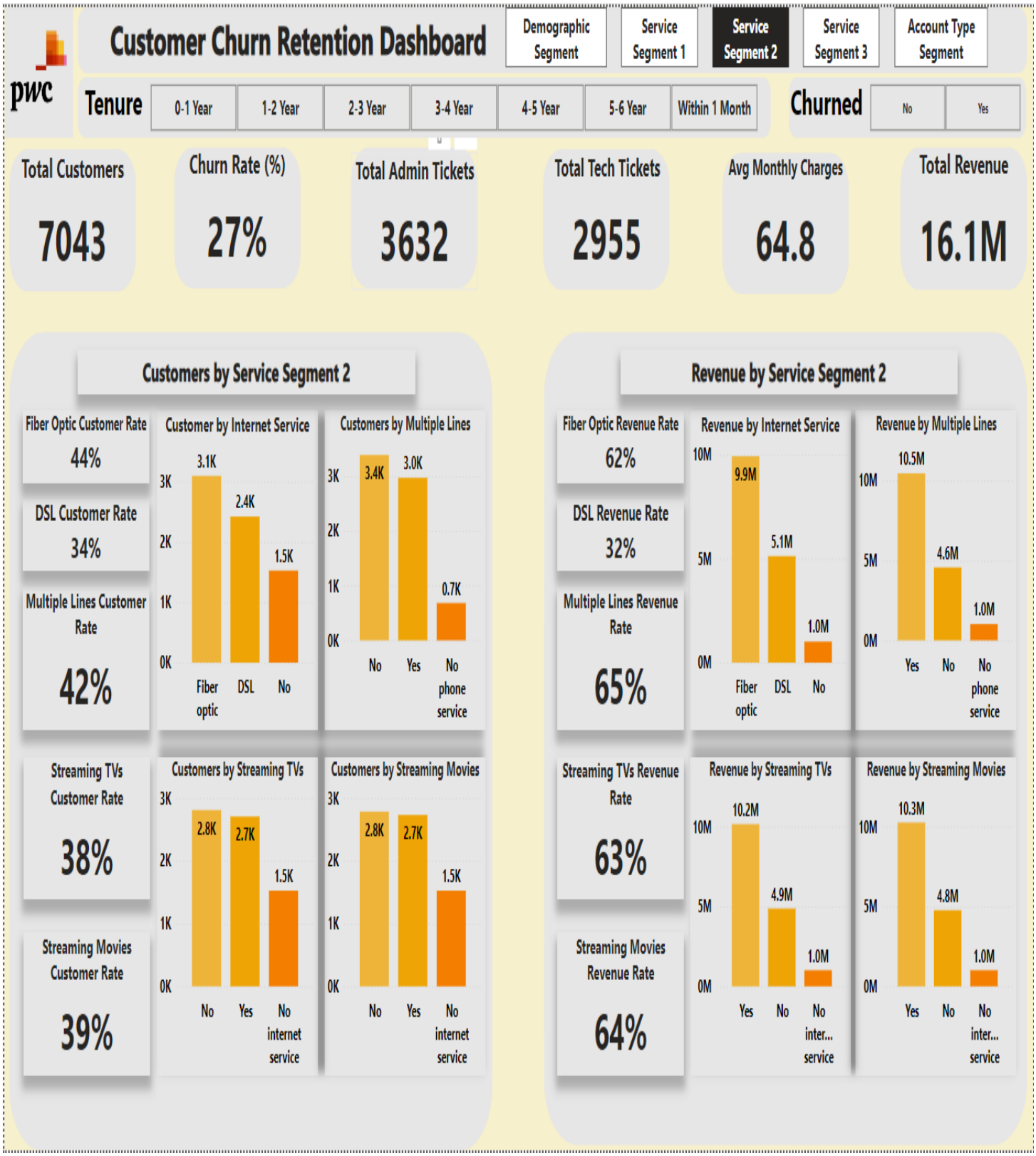
```
SELECT
	Contract,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY Contract;

-- REVENUE BY CONTRACT vs CHURN:
SELECT
	Contract,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Contract;

-- CHURN RATE BY REVENUE vs CONTRACT :
SELECT
	Contract,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY Contract;

-------------------------------------------------------------------------

-- CUSTOMER BY PAYMENT METHOD :
SELECT
	PaymentMethod,
	COUNT(DISTINCT customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaymentMethod;

-- PERCENT :
SELECT
	PaymentMethod,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaymentMethod;

-- CUSTOMER BY PAYMENT METHOD vs CHURN
SELECT
	PaymentMethod,
	COUNT(DISTINCT customerID) AS Total_Customers
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaymentMethod;

-- CHURN RATE BY CUSTOMERS vs PAYMENT METHOD :
SELECT
	PaymentMethod,
	CEILING(COUNT(DISTINCT customerID) * 100 / (SELECT COUNT(DISTINCT customerID) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Customer
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaymentMethod;

-- REVENUE BY PAYMENT METHOD :
```

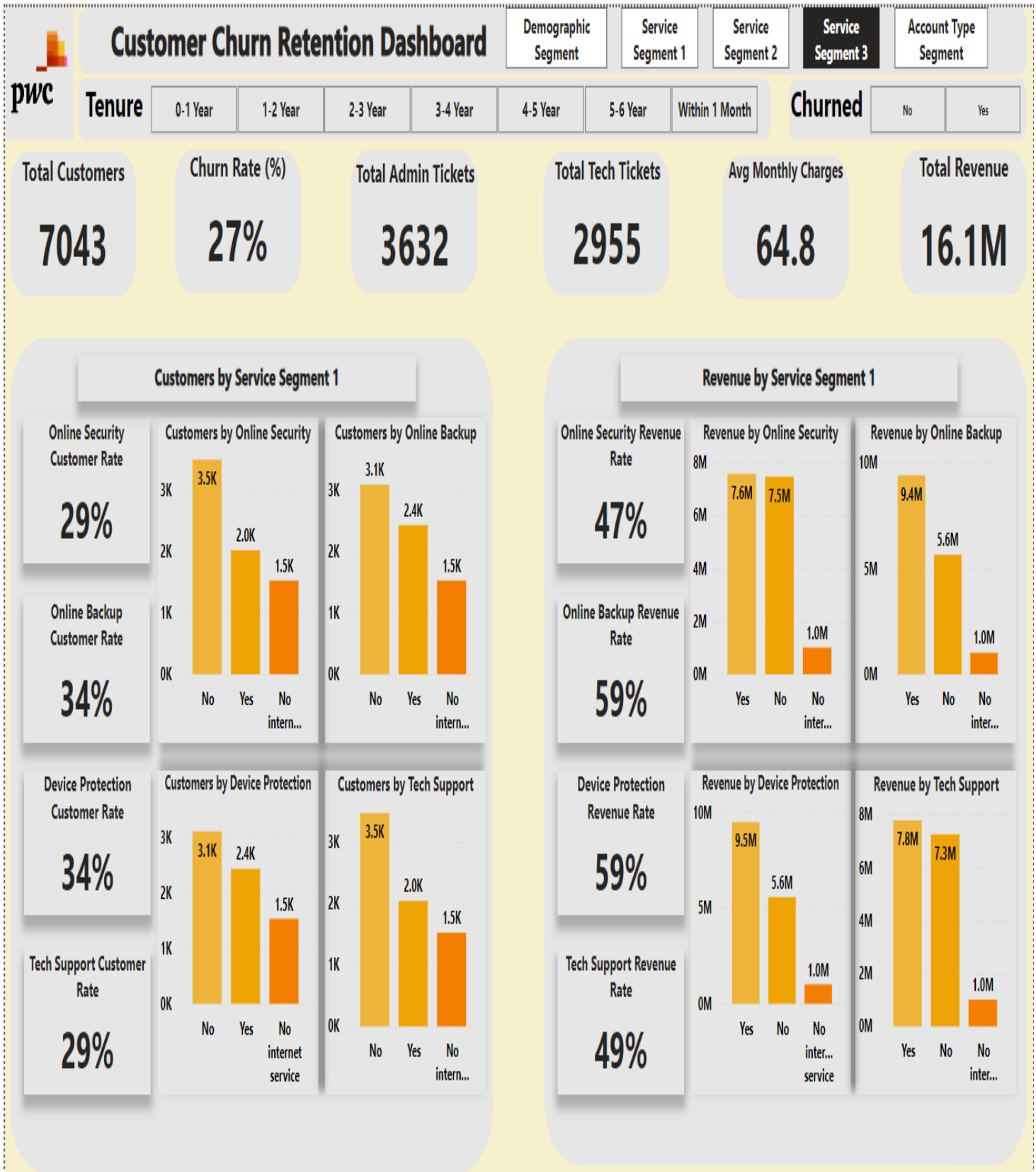
```
SELECT
	PaymentMethod,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaymentMethod;

--PERCENTAGE :
SELECT
	PaymentMethod,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset)) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
GROUP BY PaymentMethod;

-- REVENUE BY PAYMENT METHOD vs CHURN:
SELECT
	PaymentMethod,
	SUM(TotalCharges) AS Total_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaymentMethod;

-- CHURN RATE BY REVENUE vs PAYMENT METHOD :
SELECT
	PaymentMethod,
	CEILING(SUM(TotalCharges) * 100 / (SELECT SUM(TotalCharges) FROM
PWC_DataAnalytics.dbo.ChurnDataset WHERE Churn = 'Yes')) AS Rate_by_Revenue
FROM PWC_DataAnalytics.dbo.ChurnDataset
WHERE Churn = 'Yes'
GROUP BY PaymentMethod;

-------------------------------------------------------------------------

SELECT * FROM PWC_DataAnalytics.dbo.ChurnDataset
```

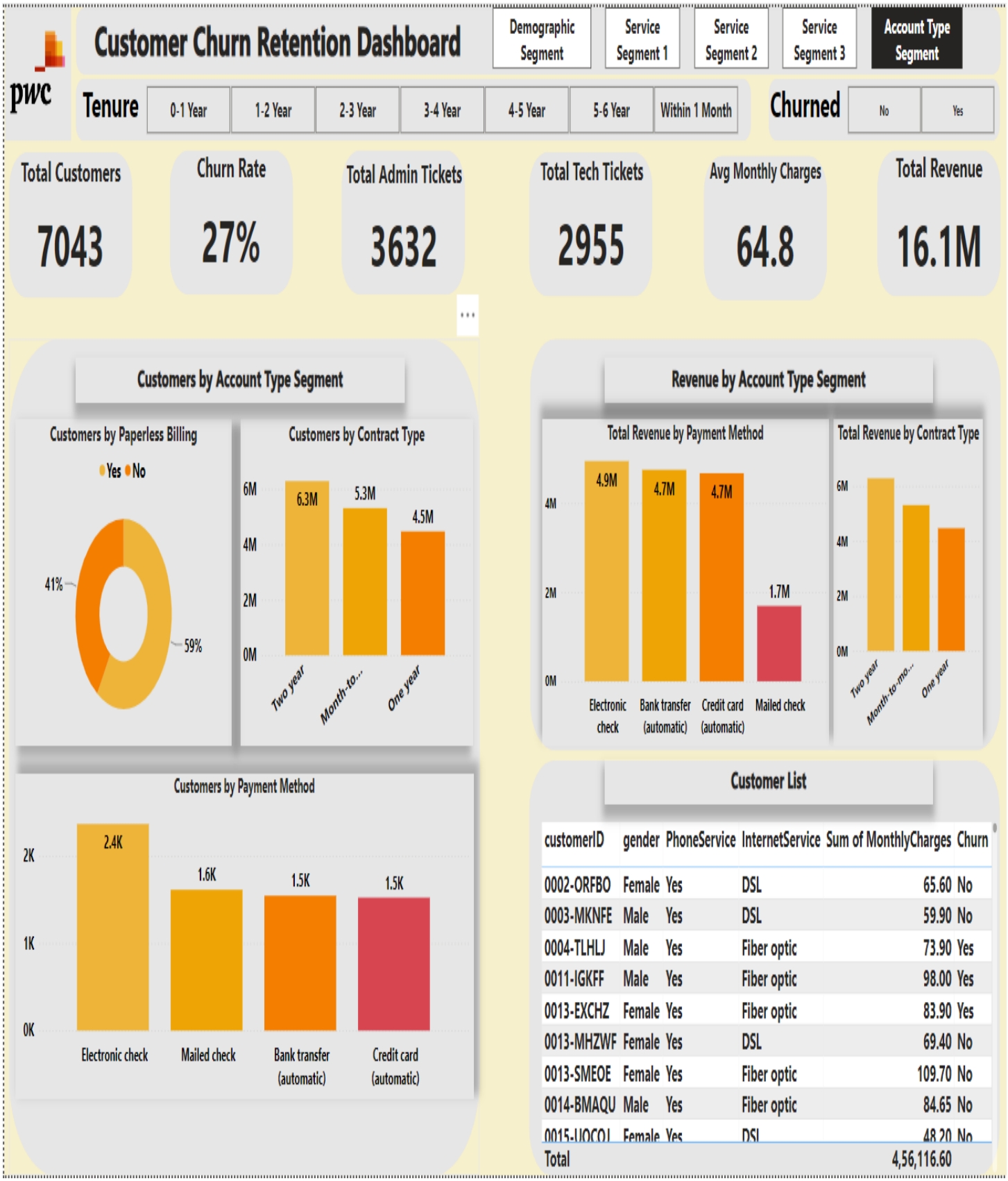
D)Conclusions: Final Dashbaord




Customer Churn Retention Dashboard
Demographic Segment
Service Segment 1
Service Segment 2
Service Segment 3
Account Type Segment
pwc
Tenure
0-1 Year
1-2 Year
2-3 Year
3-4 Year
4-5 Year
5-6 Year
Within 1 Month
Churned
No
Yes
Total Customers
7043
Churn Rate (%)
27%
Total Admin Tickets
3632
Total Tech Tickets
2955
Avg Monthly Charges
64.8
Total Revenue
16.1M
Customers by Service Segment 1
Revenue by Service Segment 1
Phone Service Customer Rate
90%
Customer by Phone Service
7K
6K
5K
4K
3K
2K
1K
0K
6.4K
0.7K
Yes
No
Phone Service Revenue Rate
94%
Revenue by Gender
15M
10M
5M
0M
15.0M
1.0M
Yes
No


Customer Churn Retention Dashboard
Demographic Segment
Service Segment 1
Service Segment 2
Service Segment 3
Account Type Segment
pwc
Tenure
0-1 Year
1-2 Year
2-3 Year
3-4 Year
4-5 Year
5-6 Year
Within 1 Month
Churned
No
Yes
Total Customers
7043
Churn Rate (%)
27%
Total Admin Tickets
3632
Total Tech Tickets
2955
Avg Monthly Charges
64.8
Total Revenue
16.1M
Customers by Service Segment 2
Fiber Optic Customer Rate
44%
DSL Customer Rate
34%
Multiple Lines Customer Rate
42%
Customer by Internet Service
3.1K
2.4K
1.5K
Fiber optic
DSL
No
Customers by Multiple Lines
3.4K
3.0K
0.7K
No
Yes
No phone service
Streaming TVs Customer Rate
38%
Streaming Movies Customer Rate
39%
Customers by Streaming TVs
2.8K
2.7K
1.5K
No
Yes
No internet service
Customers by Streaming Movies
2.8K
2.7K
1.5K
No
Yes
No internet service
Revenue by Service Segment 2
Fiber Optic Revenue Rate
62%
DSL Revenue Rate
32%
Multiple Lines Revenue Rate
65%
Revenue by Internet Service
9.9M
5.1M
1.0M
Fiber optic
DSL
No
Revenue by Multiple Lines
10.5M
4.6M
1.0M
Yes
No
No phone service
Streaming TVs Revenue Rate
63%
Streaming Movies Revenue Rate
64%
Revenue by Streaming TVs
10.2M
4.9M
1.0M
Yes
No
No inter... service
Revenue by Streaming Movies
10.3M
4.8M
1.0M
Yes
No
No inter... service


Customer Churn Retention Dashboard
Demographic Segment
Service Segment 1
Service Segment 2
Service Segment 3
Account Type Segment
pwc
Tenure
0-1 Year
1-2 Year
2-3 Year
3-4 Year
4-5 Year
5-6 Year
Within 1 Month
Churned
No
Yes
Total Customers
7043
Churn Rate (%)
27%
Total Admin Tickets
3632
Total Tech Tickets
2955
Avg Monthly Charges
64.8
Total Revenue
16.1M
Customers by Service Segment 1
Online Security Customer Rate
29%
Customers by Online Security
3.5K
2.0K
1.5K
No
Yes
No intern...
Customers by Online Backup
3.1K
2.4K
1.5K
No
Yes
No intern...
Online Backup Customer Rate
34%
Device Protection Customer Rate
34%
Customers by Device Protection
3.1K
2.4K
1.5K
No
Yes
No internet service
Customers by Tech Support
3.5K
2.0K
1.5K
No
Yes
No intern...
Tech Support Customer Rate
29%
Revenue by Service Segment 1
Online Security Revenue Rate
47%
Revenue by Online Security
7.6M
7.5M
1.0M
Yes
No
No inter...
Revenue by Online Backup
9.4M
5.6M
1.0M
Yes
No
No inter...
Online Backup Revenue Rate
59%
Device Protection Revenue Rate
59%
Revenue by Device Protection
9.5M
5.6M
1.0M
Yes
No
No inter... service
Revenue by Tech Support
7.8M
7.3M
1.0M
Yes
No
No inter...
Tech Support Revenue Rate
49%


Customer Churn Retention Dashboard
Demographic Segment
Service Segment 1
Service Segment 2
Service Segment 3
Account Type Segment
pwc
Tenure
0-1 Year
1-2 Year
2-3 Year
3-4 Year
4-5 Year
5-6 Year
Within 1 Month
Churned
No
Yes
Total Customers
7043
Churn Rate
27%
Total Admin Tickets
3632
Total Tech Tickets
2955
Avg Monthly Charges
64.8
Total Revenue
16.1M
Customers by Account Type Segment
Customers by Paperless Billing
Yes
No
41%
59%
Customers by Contract Type
6M
4M
2M
0M
6.3M
5.3M
4.5M
Two year
Month-to...
One year
Revenue by Account Type Segment
Total Revenue by Payment Method
4M
2M
0M
4.9M
4.7M
4.7M
1.7M
Electronic check
Bank transfer (automatic)
Credit card (automatic)
Mailed check
Total Revenue by Contract Type
6M
4M
2M
0M
Two year
Month-to-mo...
One year
Customers by Payment Method
2K
1K
0K
2.4K
1.6K
1.5K
1.5K
Electronic check
Mailed check
Bank transfer (automatic)
Credit card (automatic)
Customer List
customerID
gender
PhoneService
InternetService
Sum of MonthlyCharges
Churn
0002-ORFBO Female Yes DSL 65.60 No
0003-MKNFE Male Yes DSL 59.90 No
0004-TLHLJ Male Yes Fiber optic 73.90 Yes
0011-IGKFF Male Yes Fiber optic 98.00 Yes
0013-EXCHZ Female Yes Fiber optic 83.90 Yes
0013-MHZWF Female Yes DSL 69.40 No
0013-SMEOE Female Yes Fiber optic 109.70 No
0014-BMAQU Male Yes Fiber optic 84.65 No
0015-UOCOJ Female Yes DSL 48.20 No
Total
4,56,116.60

4.3. TASK 3: DIVERSITY ANALYTICS

A) Dataset Overview:

Human Resources is looking for Insights into improving gender abalance at executive level. Define Relevant KPIs in hiring, promotion, performance and turnover. Create a Dashbaord Visualsation.

Human Resources at our telecom client is highly into diversity and inclusion. They've been working hard to improve gender balance at the executive management level, but they're not seeing any progress. They're reaching out to us for help.

At PwC Switzerland we are often approached by clients seeking support with diversity and inclusion. Companies need a workforce of diverse talents and backgrounds to succeed in an increasingly complex and heterogeneous world. To us, diversity and inclusion are business imperatives, not just nice-to-haves. We aim for all of our teams to feel welcome and appreciated. But actually

achieving this and unlocking its potential involves a whole set of practical challenges.

Here is a hint: Calculating the following measures could help to define proper KPIs:

# of men

# of women

# of leavers

% employees promoted (FY21)

% of women promoted

% of hires men

% of hires women

% turnover

Average performance rating: men

Average Performance rating: women

B) Key Performance Indicator Metrics:

1) Employee in FY20
2) Employee in FY21
3) Hiring Rate FY20
4) Exit Rate FY20
5) Employee in FY20 by Gender
6) Employee in FY21 by Gender
7) Promotion in FY20 by Gender
8) Promotion in FY21 by Gender
9) Promotion Rate FY20 (Male & Female)
10) Promotion by Job Level After FY20 Promotion by Gender
11) Promotion Rate FY21 (Male & Female)
12) Promotion by Job Level After FY21 Promotion by Gender
13) Average Rating FY19 (Male & Female)
14) Performance Rating in FY19 on Job Level by Gender
15) Average Rating of FY20 (Male & Female)
16) Performance Rating in FY20 on Job Level by Gender
17) Age Group by Gender
18) Age Group on Executive Level by Gender
19) Region by Gender
20) Region on Executive Level by Gender
21) Job Type by Gender
22) Job type on Executive Level by Gender

C) Exploratory Data Analysis:

SQL Queries:

```
-- DIVERSITY & INCLUSION ANALYSIS :
-------------------------------------------------------------------------

SELECT * FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- TRANSFORMATION : Last_hrie_date from varchar to date
SELECT *
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

ALTER TABLE PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
ALTER COLUMN Last_hire_date DATE;

UPDATE PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
SET Last_hire_date = CAST(Last_hire_date AS DATE)

ALTER TABLE PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
ALTER COLUMN FY19_Performance_Rating INT;

ALTER TABLE PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
ALTER COLUMN FY20_Performance_Rating INT;

-------------------------------------------------------------------------------------------------------
-----------------------------------------------------

-- ANALYSIS:

SELECT *
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-- TOTAL EMPLOYEE FY20 :
SELECT
       COUNT(Employee_ID) AS Total_Employee_Count
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- TOTAL EMPLOYEE FY21 :
SELECT
       SUM(CASE WHEN FY20_leaver = 'No' THEN 1 ELSE 0 END) AS Total_Employee_FY21
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- EMPLOYEE FY20 BY GENDER :
SELECT
       Gender,
       COUNT(Employee_ID) AS Total_Employee_Count
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender;
```

```
-------------------------------------------------------------------------

-- TOTAL EMPLOYEE FY21 BY GENDER :
SELECT
	Gender,
	SUM(CASE WHEN FY20_leaver = 'No' THEN 1 ELSE 0 END) AS Total_Employee_FY21
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender;

-------------------------------------------------------------------------

-- EMPLOYEE FY20 PERCENTAGE BY GENDER :
SELECT
	Gender,
	CEILING(SUM(CASE WHEN FY20_leaver = 'No' THEN 1 ELSE 0 END) * 100 / (
	SELECT SUM(CASE WHEN FY20_leaver = 'No' THEN 1 ELSE 0 END) FROM
PWC_DataAnalytics.dbo.DiversityInclusion_Dataset))
	AS Employee_FY21
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender;

-------------------------------------------------------------------------

-- EMPLOYEE FY21 PERCENTAGE BY GENDER :
SELECT
	Gender,
	CEILING(COUNT(DISTINCT Employee_ID) * 100 / (SELECT COUNT(DISTINCT Employee_ID) FROM
PWC_DataAnalytics.dbo.DiversityInclusion_Dataset)) AS Employee_Count_Rate
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender;

-------------------------------------------------------------------------

-- PROMOTION BY GENDER FY20 :
SELECT
	Promotion_in_FY20,
	Gender,
	SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END) AS Promotion_For_FY20
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender, Promotion_in_FY20;

-------------------------------------------------------------------------

-- EMPLOYEE COUNT BY GENDER AFTER FY20 PROMOTION :
SELECT
	Job_Level_after_FY20_promotions,
	Gender,
	COUNT(Employee_ID) AS Employee_FY20
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender, Job_Level_after_FY20_promotions;

-------------------------------------------------------------------------

-- EMPLOYEE COUNT BY GENDER AFTER FY21 PROMOTION :
SELECT
	Job_Level_after_FY21_promotions,
	Gender,
	SUM(CASE WHEN FY20_leaver = 'No' THEN 1 ELSE 0 END) AS Employee_FY21
```

```
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender, Job_Level_after_FY21_promotions
HAVING SUM(CASE WHEN FY20_leaver = 'No' THEN 1 ELSE 0 END) > 0;

-------------------------------------------------------------------------

-- PROMOTION BY GENDER IN FY20 :
SELECT
	SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END) AS EmployeE_Promotion_FY20
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Promotion_in_FY20, Gender;

-------------------------------------------------------------------------

-- PROMOTION BY GENDER FY21 :
SELECT
	COUNT(DISTINCT Employee_ID) AS Employee_Promotion_FY21
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Promotion_in_FY21, Gender;

-------------------------------------------------------------------------

-- PROMOTION RATE IN FY20 :
SELECT
	SUM(CASE WHEN New_hire_FY20 = 'N' AND Promotion_in_FY20 = 'Y' THEN 1 ELSE 0 END) * 100 /
(
	SELECT SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END)) AS Promotion_Rate_FY20
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- PROMOTION RATE IN FY20 BY GENDER :
-- MALE
SELECT
	SUM(CASE WHEN New_hire_FY20 = 'N' AND Promotion_in_FY20 = 'Y' AND Gender = 'Male' THEN 1
ELSE 0 END) * 100 / (
	SELECT SUM(CASE WHEN New_hire_FY20 = 'N' AND Promotion_in_FY20 = 'Y' THEN 1 ELSE 0 END))
AS Promotion_Rate_FY20_Male
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-- FEMALE :
SELECT
	SUM(CASE WHEN New_hire_FY20 = 'N' AND Promotion_in_FY20 = 'Y' AND Gender = 'Female' THEN
1 ELSE 0 END) * 100 / (
	SELECT SUM(CASE WHEN New_hire_FY20 = 'N' AND Promotion_in_FY20 = 'Y' THEN 1 ELSE 0 END))
AS Promotion_Rate_FY20_Female
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- PROMOTION RATE IN FY21 :
SELECT
	SUM(CASE WHEN Promotion_in_FY21 = 'Yes' THEN 1 ELSE 0 END) * 100 / (
	SELECT
		SUM(CASE WHEN In_base_group_for_Promotion_FY21 = 'Yes' THEN 1 ELSE 0 END)
	FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset) AS Promotion_Rate_FY21
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

SELECT * FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;
```

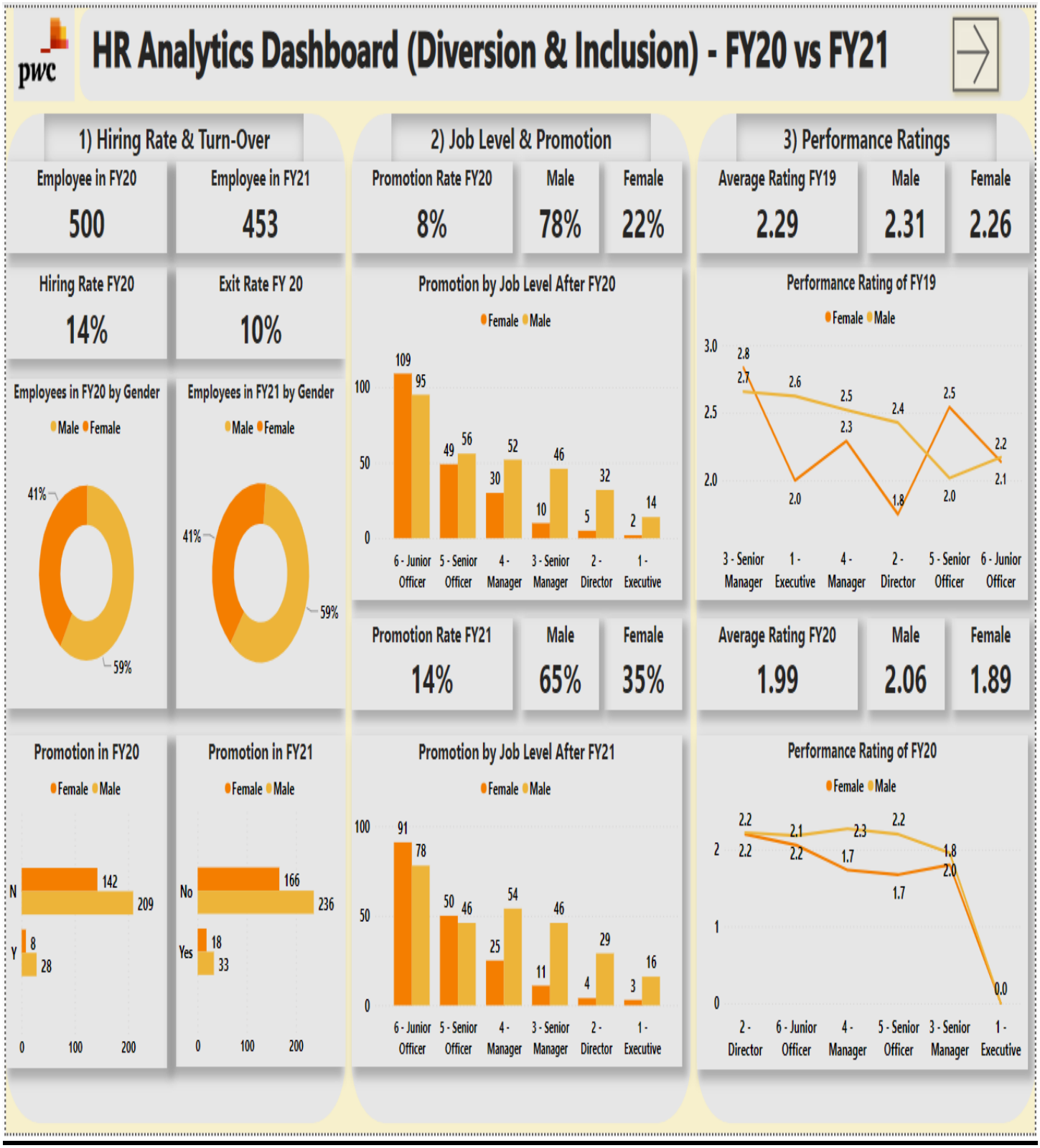
```
-------------------------------------------------------------------------

-- PROMOTION RATE IN FY21 BY GENDER :
-- MALE
SELECT
	SUM(CASE WHEN Promotion_in_FY21 = 'Yes' AND Gender = 'Male' THEN 1 ELSE 0 END) * 100 / (
	SELECT SUM(CASE WHEN Promotion_in_FY21 = 'Yes' THEN 1 ELSE 0 END)) AS
Promotion_Rate_FY21_Male
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-- FEMALE :
SELECT
	SUM(CASE WHEN Promotion_in_FY21 = 'Yes' AND Gender = 'Female' THEN 1 ELSE 0 END) * 100 /
(
	SELECT SUM(CASE WHEN Promotion_in_FY21 = 'Yes' THEN 1 ELSE 0 END)) AS
Promotion_Rate_FY21_Female
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- HIRING RATE FY20 :
WITH HiringRate AS(
	SELECT
		COUNT(DISTINCT Employee_ID) AS Total_Employee,
		SUM(CASE WHEN New_hire_FY20 = 'Y' THEN 1 ELSE 0 END) AS New_Hire_Count,
		SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END) AS Old_Count
	FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
)
SELECT
	(New_Hire_Count * 100) / ((Total_Employee + Old_Count)/2) AS Hiring_Rate_FY20
FROM HiringRate;

-------------------------------------------------------------------------

-- HIRING RATE FY20 BY GENDER :
WITH HiringRateGedner AS(
	SELECT
		Gender,
		COUNT(DISTINCT Employee_ID) AS Total_Employee,
		SUM(CASE WHEN New_hire_FY20 = 'Y' THEN 1 ELSE 0 END) AS New_Hire_Count,
		SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END) AS Old_Count
	FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
	GROUP BY Gender
)
SELECT
	Gender,
	CEILING((New_Hire_Count * 100) / ((Total_Employee + Old_Count)/2)) AS Hiring_Rate_FY20
FROM HiringRateGedner;

-------------------------------------------------------------------------

-- EMPLOYEE EXIT RATE:
WITH ExitRate AS(
	SELECT
		COUNT(DISTINCT Employee_ID) AS Total_Employee,
		SUM(CASE WHEN FY20_leaver = 'Yes' THEN 1 ELSE 0 END) AS New_Hire_Count,
		SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END) AS Old_Count
	FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
)
```

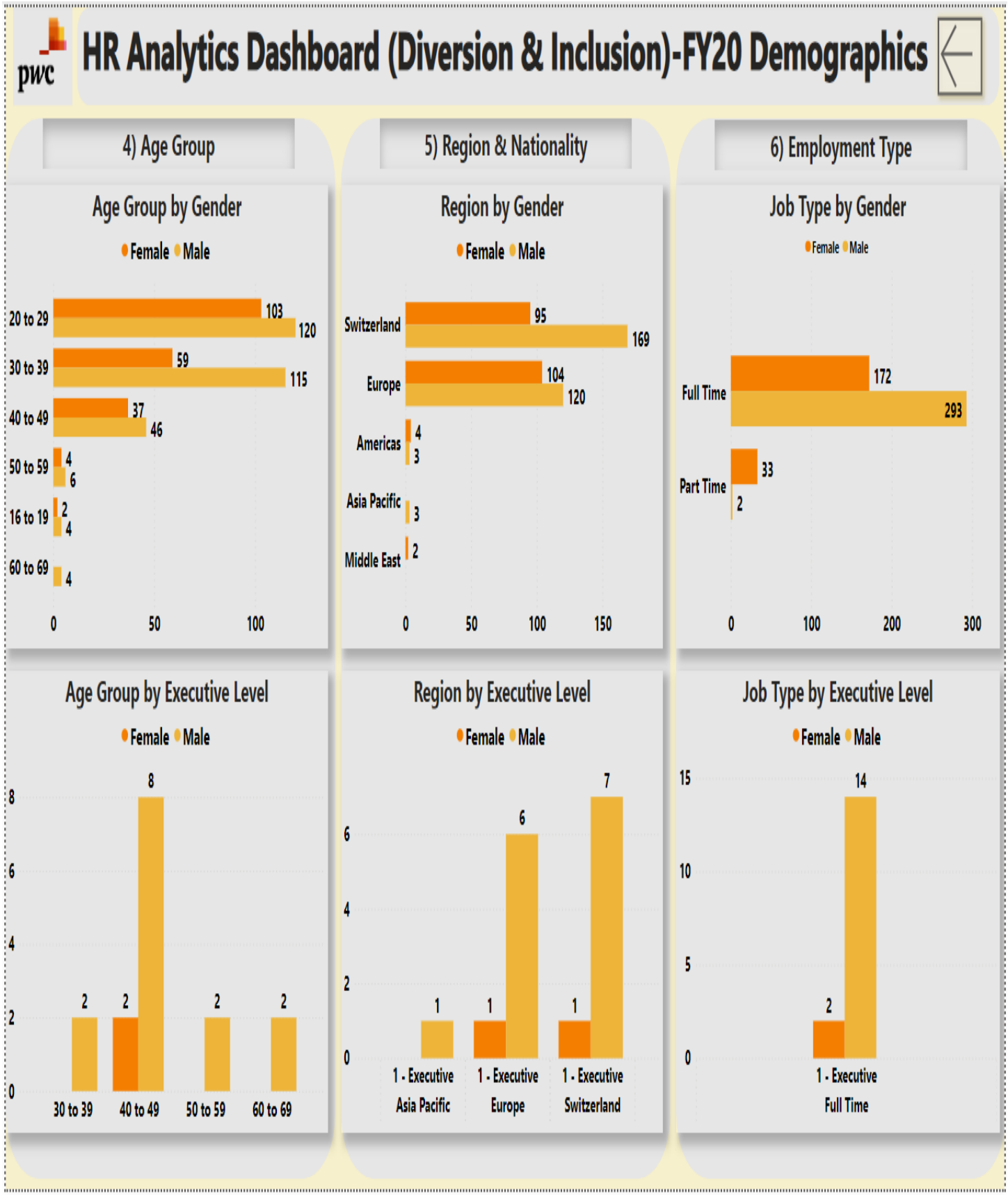
```
SELECT
       (New_Hire_Count * 100) / ((Total_Employee + Old_Count)/2) AS Hiring_Rate_FY20
FROM ExitRate;

-----------------------------------------------------------------------------

-- EMPLOYEE EXIT RATE BY GENDER:
WITH ExitRateGender AS (
    SELECT
        Gender,
        COUNT(DISTINCT Employee_ID) AS Total_Employee,
        SUM(CASE WHEN FY20_leaver = 'Yes' THEN 1 ELSE 0 END) AS Leaver_Count,
        SUM(CASE WHEN New_hire_FY20 = 'N' THEN 1 ELSE 0 END) AS Old_Count
    FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
    GROUP BY Gender
)

SELECT
    Gender,
    CEILING((Leaver_Count * 100.0) / ((Total_Employee + Old_Count)/2)) AS Exit_Rate_FY20
FROM ExitRateGender;

-----------------------------------------------------------------------------

-- PERFORMANCE RATING IN FY19 BY GENDER AND JOB LEVEL:
SELECT
       Job_Level_before_FY20_promotions, Gender,
       AVG(CASE WHEN New_hire_FY20 = 'N' THEN FY19_Performance_Rating ELSE 0 END) AS
Performance_Rating_FY19
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Job_Level_before_FY20_promotions, Gender
HAVING AVG(CASE WHEN New_hire_FY20 = 'N' THEN FY19_Performance_Rating ELSE 0 END) > 0;

-----------------------------------------------------------------------------

-- AVERAGE OF PERFORMANCE RATING IN FY19 :
SELECT
       AVG(FY19_Performance_Rating) AS Performance_Rating_FY19
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
WHERE New_hire_FY20 = 'N';


-----------------------------------------------------------------------------

-- AVERAGE PERFORMANCE RATING BY GENDER IN FY19 :
SELECT
       Gender,
       AVG(FY19_Performance_Rating) AS Performance_Rating_FY19
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
WHERE New_hire_FY20 = 'N'
GROUP BY Gender;

-----------------------------------------------------------------------------

-- PERFORMANCE RATING IN FY20 BY GENDER AND JOB LEVEL :
SELECT
       Job_Level_after_FY20_promotions,
       Gender,
       AVG(FY20_Performance_Rating) AS Performance_Rating_FY20
```

```
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Job_Level_after_FY20_promotions, Gender;

-------------------------------------------------------------------------

-- AVERAGE PERFORMANCE RATING IN FY20 :
SELECT
       AVG(FY20_Performance_Rating) AS Performance_Rating_FY20
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;

-------------------------------------------------------------------------

-- AVERAGE PERFORMANCE RATING BY GENDER IN FY20 :
SELECT
       Gender,
       AVG(FY20_Performance_Rating) AS Performance_Rating_FY20
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender;

-------------------------------------------------------------------------

-- AGE GROUP BY GENDER :
SELECT
       Gender,
       Age_group,
       COUNT(DISTINCT Employee_ID) AS Employee_Count
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender, Age_group;

-------------------------------------------------------------------------

-- AGE GROUP BY EXECUTIVE LEVEL BY GENDER :
SELECT
       Gender,
       Age_group,
       COUNT(DISTINCT Employee_ID) AS Employee_Count_at_Executive_Level
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
WHERE Job_Level_after_FY20_promotions = '1 - Executive'
GROUP BY Gender, Age_group;

-------------------------------------------------------------------------

-- REGION BY GENDER :
SELECT
       Gender,
       [Region group  nationality 1],
       COUNT(DISTINCT Employee_ID) AS Employee_Count
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender, [Region group  nationality 1];

-------------------------------------------------------------------------

-- REGION BY EXECUTIVE LEVEL BY GENDER :
SELECT
       [Region group  nationality 1],
       Age_group,
       COUNT(DISTINCT Employee_ID) AS Employee_Count_at_Executive_Level
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
WHERE Job_Level_after_FY20_promotions = '1 - Executive'
```

```
GROUP BY [Region group  nationality 1], Age_group;

-------------------------------------------------------------------------

-- JOB TYPE BY GENDER :
SELECT
       Gender,
       Time_type,
       COUNT(DISTINCT Employee_ID) AS Employee_Count
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
GROUP BY Gender, Time_type;

-------------------------------------------------------------------------

-- JOB TYPE BY EXECUTIVE LEVEL BY GENDER :
SELECT
       Time_type,
       Gender,
       COUNT(DISTINCT Employee_ID) AS Employee_Count_at_Executive_Level
FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset
WHERE Job_Level_after_FY20_promotions = '1 - Executive'
GROUP BY Time_type, Gender;

-------------------------------------------------------------------------

SELECT * FROM PWC_DataAnalytics.dbo.DiversityInclusion_Dataset;
```

D) Conclusion: Final Dashboard:




HR Analytics Dashboard (Diversion & Inclusion)-FY20 Demographics
4) Age Group
Age Group by Gender
Female Male
20 to 29 103 120
30 to 39 59 115
40 to 49 37 46
50 to 59 4 6
16 to 19 2 4
60 to 69 4
0 50 100
5) Region & Nationality
Region by Gender
Female Male
Switzerland 95 169
Europe 104 120
Americas 4 3
Asia Pacific 3
Middle East 2
0 50 100 150
6) Employment Type
Job Type by Gender
Female Male
Full Time 172 293
Part Time 33 2
0 100 200 300
Age Group by Executive Level
Female Male
0 2 4 6 8
2 2 2 2
30 to 39 40 to 49 50 to 59 60 to 69
Region by Executive Level
Female Male
0 2 4 6
1 1 6 1 7
1 - Executive Asia Pacific
1 - Executive Europe
1 - Executive Switzerland
Job Type by Executive Level
Female Male
0 5 10 15
2 14
1 - Executive Full Time

END CREDITS

THANK YOU:

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