

# Telecom Customer Churn Analysis

Understanding the Basics and Beyond

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# Agenda

- Introduction
- Problem Statement
- Objectives
- Dataset Overview
- Data Preprocessing
- Findings & Insights
- Recommendations
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- Conclusion



# Introduction

## What is Customer Churn?

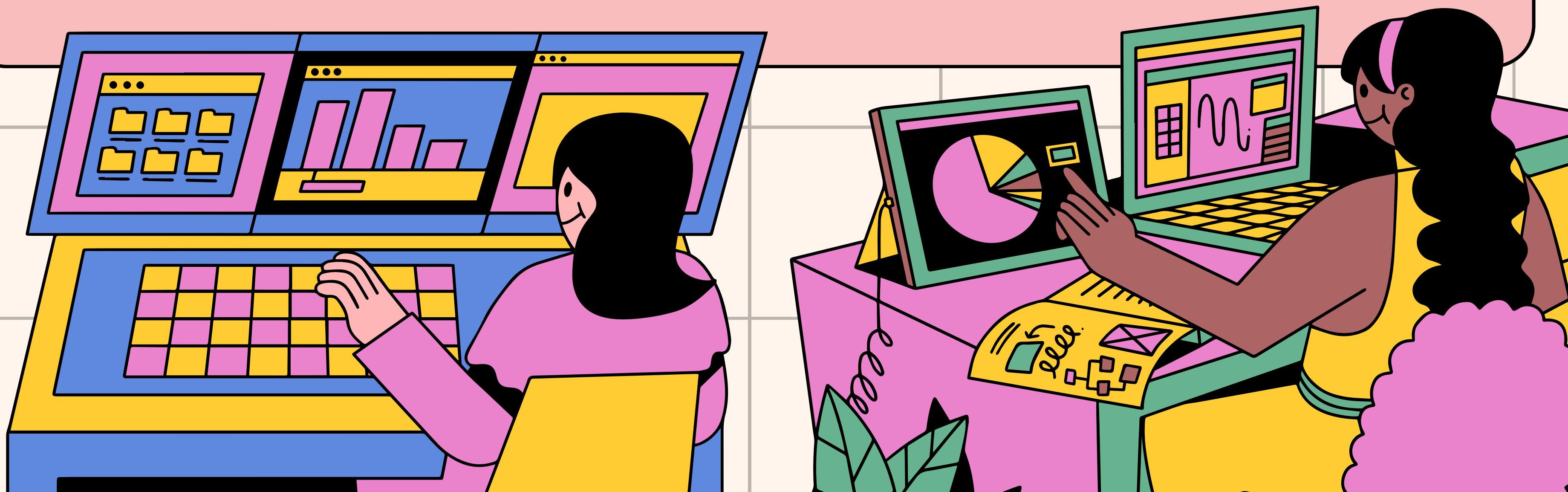
Customer churn refers to the percentage of customers who stop using a company's product or service during a given time period. For telecom companies, reducing churn is critical because acquiring new customers is more expensive than retaining existing ones.

- Identifying factors that contribute to customer churn helps telecom companies improve customer retention.
- Churn prediction models can aid in proactive customer engagement and prevent revenue loss.
- Optimizing services based on churn insights helps enhance customer satisfaction and loyalty



# Problem Statement

## Predicting Customer Churn in Telecom Industry



# Objective

**The primary objectives of this churn analysis are to:**

- Identify key factors contributing to customer churn
- Develop predictive models to accurately forecast churn
- Provide actionable insights to help reduce churn and improve customer retention
- Recommend strategic interventions to optimize customer retention and reduce churn rates



# Dataset Overview

## Dataset Description

Total Records: 7044

## Key Features

- Customer demographics: Age, Gender, Marital Status, Dependents
- Service details: Tenure, Monthly Charges, Contract Type, Internet Service, Payment Method
- Churn status (Target Variable): Whether the customer has Churned, Stayed, joined



# Data Preprocessing

To ensure the data was ready for analysis, the following preprocessing steps were taken:

- Missing Data Handling
- Feature Engineering
- Irrelevant Columns were removed





# Finding and insights

# Identify the total number of customers and the churn rate

```
-- Identify the total number of customers and the churn rate
```

- **SELECT**

```
COUNT('Customer ID') AS Total_Customer,  
SUM(CASE  
    WHEN CustomerStatus = 'Churned' THEN 1  
    ELSE 0  
END) AS Churned_Customers,  
SUM(CASE  
    WHEN CustomerStatus = 'Churned' THEN 1  
    ELSE 0  
END) * 100.0 / COUNT('Customer ID') AS Churn_rate  
FROM  
churn.telecom_churn;
```

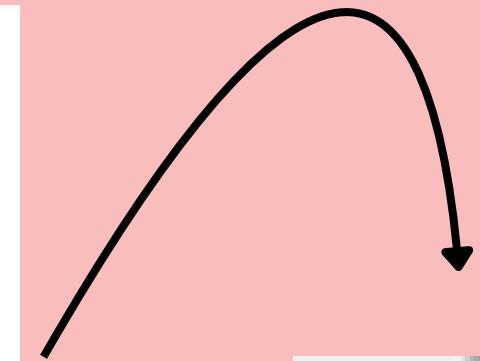
=====  
Result Grid | Filter Rows: \_\_\_\_\_ | Export  
  

Total_Customer	Churned_Customers	Churn_rate
7043	1869	26.53699



# Average age of churned customers

```
-- Find the average age of churned customers  
  
Select avg(Age) as Average_Age  
from churn.telecom_churn  
Where CustomerStatus = 'Churned';
```



Result Grid	
	avg(Age)
▶	49.7357



# Discover the most common contract types among churned customers

```
-- Discover the most common contract types among churned customers

SELECT
    Contract, COUNT(Contract) AS 'Common Contract'
FROM
    churn.telecom_churn
WHERE
    CustomerStatus = 'Churned'
GROUP BY Contract
ORDER BY 'Common Contract' DESC
```



A black curved arrow points from the text "Discover the most common contract types among churned customers" in the top left towards the "Result Grid" table below.

	Contract	Common Contract
▶	Month-to-Month	1655
	One Year	166
	Two Year	48

# Analyze the distribution of monthly charges among churned customers

```
-- Analyze the distribution of monthly charges among churned customers

SELECT
    `Monthly Charge`,
    COUNT(*) AS `Number of Customers`
FROM
    churn.telecom_churn
WHERE
    `CustomerStatus` = 'Churned'
GROUP BY
    `Monthly Charge`
ORDER BY
    `Monthly Charge` j
```



A black curved arrow points from the text "Analyze the distribution of monthly charges among churned customers" in the title area down to the "CustomerStatus" clause in the SQL code.

	Monthly Charge	Number of Customers
►	-10	2
	-9	2
	-8	2
	-7	6
	-5	3
	-4	5
	-3	1
	-2	2
	-1	7
	18.85	1
	18.95	1
	19	1
	19.1	1
	19.25	3
	19.3	3

# Query to identify the contract types that are most prone to churn

```
1  --- Create a query to identify the contract types that are most prone to churn
2
3 * SELECT
4     Contract,
5     COUNT(*) AS Total_Customers,
6     SUM(CASE WHEN CustomerStatus = 'Churned' THEN 1 ELSE 0 END) AS Churned_Customers,
7     (SUM(CASE WHEN CustomerStatus = 'Churned' THEN 1 ELSE 0 END) / COUNT(*)) * 100 AS Churn_Rate_Percentage
8   FROM
9     churn.telecom_churn
10  GROUP BY
11    Contract
12  ORDER BY
13    Churn_Rate_Percentage DESC
14
```

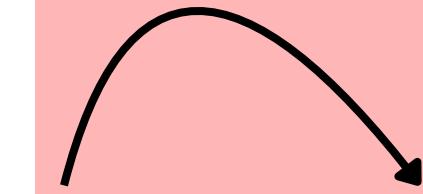


A curved arrow points from the text block above to this table, indicating the result of the query.

	Contract	Total_Customers	Churned_Customers	Churn_Rate_Percentage
▶	Month-to-Month	3610	1655	45.8449
	One Year	1550	166	10.7097
	Two Year	1883	48	2.5491

# Identify customers with high total charges who have churned

```
1  -- Identify customers with high total charges who have churned
2
3 * SELECT
4   "Customer ID", "Total Charges"
5   FROM
6     churn.telecom_churn
7   WHERE
8     "CustomerStatus" = "Churned"
9   ORDER BY "Total Charges" DESC
10  LIMIT 10;
```

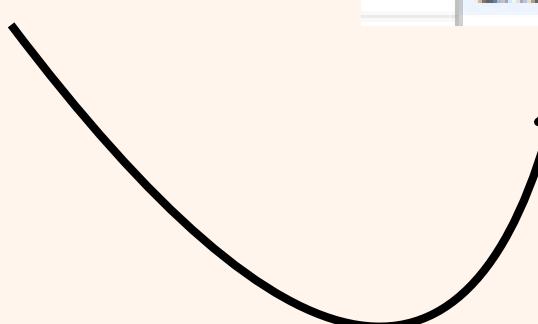


	Customer ID	Total Charges
▶	2889-FPWRM	8684.8
	0201-OAMXR	8127.6
	3886-CERTZ	8109.8
	1444-WVSGW	7968.85
	5271-YNWVR	7856
	8199-ZLLSA	7804.15
	9053-JZFKV	7752.3
	1555-DJEQW	7723.9
	3259-FDWQY	7723.7
	7317-GGVPB	7690.9

# Total Charges distribution for churned and non-churned customers

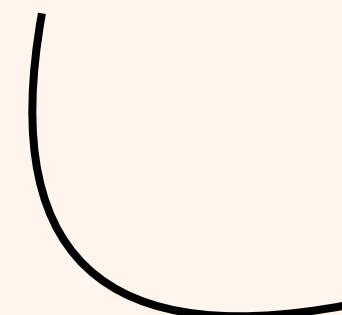
```
1  -- Calculate the total charges distribution for churned and non-churned customers
2
3 • SELECT
4      `CustomerStatus`,
5      `Total Charges`,
6      COUNT(*) AS `Customers`
7  FROM
8      churn.telecom_churn
9  GROUP BY
10     `CustomerStatus`, `Total Charges`
11 ORDER BY
12     `CustomerStatus`, `Total Charges`;
```

	CustomerStatus	Total Charges	Customers
▶	Churned	18.85	1
	Churned	19.1	1
	Churned	19.25	1
	Churned	19.3	2
	Churned	19.4	1
	Churned	19.45	3
	Churned	19.5	1
	Churned	19.55	1
	Churned	19.6	2
	Churned	19.65	2
	Churned	19.7	1
	Churned	19.75	2



# Average monthly charges for different contract types among churned customers

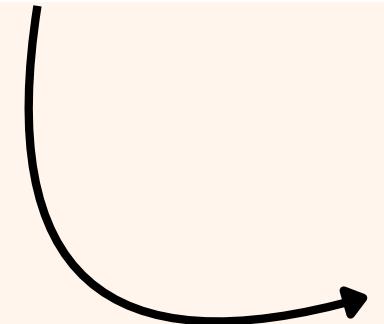
```
1 -- calculate the average monthly charges for different contract types among churned customers
2
3 • Select Round(Avg(`Monthly Charge`),2) As 'Monthly Charge',
4   `Contract`
5   from churn.telecom_churn
6   Where `CustomerStatus` = 'Churned'
7   group by `Contract`
```



	Monthly Charge	Contract
▶	71.78	Month-to-Month
	85.05	One Year
	86.78	Two Year

# Customers who have both online security and online backup services and have not churned

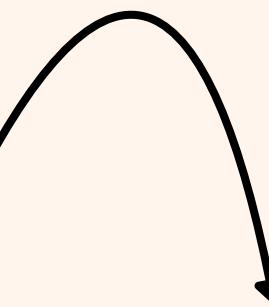
```
1 -- Identify customers who have both online security and online backup services and have not churned
2
3 • SELECT
4     `Customer ID`,
5     `Online Security`,
6     `Online Backup`
7 FROM
8     churn.telecom_churn
9 WHERE
10    `CustomerStatus` = 'Stayed'
11    AND `Online Security` = 'Yes'
12    AND `Online Backup` = 'Yes';
13
```



	Customer ID	Online Security	Online Backup
▶	0013-SMEOE	Yes	Yes
	0016-QLJIS	Yes	Yes
	0017-IUDMW	Yes	Yes
	0019-EFAEP	Yes	Yes
	0019-GFNTW	Yes	Yes
	0052-DCKON	Yes	Yes
	0060-FUALY	Yes	Yes
	0074-HDKDG	Yes	Yes
	0076-LVEPS	Yes	Yes
	0083-PIVIK	Yes	Yes

# The most common combinations of services among churned customers

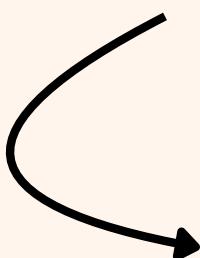
```
1   ●    SELECT
2       'Online Security',
3       'Online Backup',
4       'Device Protection Plan',
5       'Premium Tech Support',
6       'Streaming TV',
7       'Streaming Movies',
8       COUNT(*) AS 'Count'
9
10      FROM
11          churn.telecom_churn
12      WHERE
13          'CustomerStatus' = 'Churned'
14      GROUP BY
15          'Online Security',
16          'Online Backup',
17          'Device Protection Plan',
18          'Premium Tech Support',
19          'Streaming TV',
20          'Streaming Movies'
21      ORDER BY
22          'Count' DESC
23      LIMIT 10;
```



	Online Security	Online Backup	Device Protection Plan	Premium Tech Support	Streaming TV	Streaming Movies
▶	No	No	No	No	No	No
	No	No	Yes	No	No	No
	No	No	No	No	Yes	Yes
	No	No	No	No	No	Yes
	No	No	No	No	Yes	No
	No	No	Yes	No	Yes	Yes
	No	Yes	No	No	No	No
	No	Yes	Yes	No	Yes	Yes
	No	Yes	No	No	Yes	Yes
Yes	No	No	No	No	No	No

# Average total charges for customers grouped by gender and marital status

```
1   --- Identify the average total charges for customers grouped by gender and marital status  
2  
3 * select Avg("Total Charges") As "Total Charges",  
4   "Gender",  
5   "Married"  
6   From churn.telecom_churn  
7   group by "Gender", "Married"  
8
```



Total Charges	Gender	Married
2977.25077014218	Female	Yes
1542.0475828354147	Male	No
3072.714959159862	Male	Yes
1627.546055555599	Female	No

# Calculate the average monthly charges for different age groups among churned customers

```
1  -- Calculate the average monthly charges for different age groups among churned customers
2
3 * select Avg("Monthly Charge") As "Avg_monthly_Charges",
4   CASE
5     WHEN "Age" < 30 THEN "Under 30"
6     WHEN "Age" BETWEEN 30 AND 49 THEN "30-49"
7     WHEN "Age" BETWEEN 50 AND 69 THEN "50-69"
8     ELSE "70 and above"
9   END AS "Age Group"
10  From churn.telecom_churn
11  WHERE
12    "CustomerStatus" = "Churned"
13  GROUP BY
14    "Age Group";
15
16
```

A black curved arrow points from the text "Calculate the average monthly charges for different age groups among churned customers" at the top of the slide down to the "Result Grid" section of the screenshot.

	Avg_monthly_Charges	Age Group
1	74.21856677524426	50-69
2	78.54043209876544	70 and above
3	71.69194078947373	Under 30
4	70.61403508771929	30-49

# Determine the average age and total charges for customers with multiple lines and online backup

```
1  -- Determine the average age and total charges for customers with multiple lines and online backup
2
3 * Select Round(avg(`Age`),2) As `Avg Age`,
4   Round(sum(`Total Charges`),2) As `Total Charges`,
5   `Multiple Lines`,
6   `Online Backup`
7   from churn.telecom_churn
8   WHERE
9     `Multiple Lines` = 'Yes'
10    AND `Online Backup` = 'Yes'
11   group by
12     `Multiple Lines`,
13     `Online Backup`
14
15
16
```

The screenshot shows a database interface with the following components:

- SQL Editor:** Displays the SQL query with line numbers 1 through 16.
- Result Grid:** A table showing the output of the query. It has four columns: Avg Age, Total Charges, Multiple Lines, and Online Backup. The data row shows values: 48.61, 6612503.85, Yes, and Yes.
- Toolbar:** Includes buttons for Result Grid, Filter Rows, Export, and Wrap Cell Contents.
- Side Panel:** Shows two icons: "Result Grid" (selected) and "Form Editor".

A black curved arrow points from the "Result Grid" icon in the sidebar towards the "Result Grid" button in the toolbar.

	Avg Age	Total Charges	Multiple Lines	Online Backup
1	48.61	6612503.85	Yes	Yes

# Contract types with the highest churn rate among senior citizens (age 65 and over)

```
2
3 *   SELECT
4     "Contract",
5       COUNT(CASE WHEN "CustomerStatus" = "Churned" THEN 1 END) AS "Churned Customers",
6       COUNT(*) AS "Total Customers",
7       ROUND(COUNT(CASE WHEN "CustomerStatus" = "Churned" THEN 1 END) / COUNT(*) * 100, 2) AS "Churn Rate (%)"
8   FROM
9     churn.telecom_churn
10  WHERE
11    "Age" >= 65
12  GROUP BY
13    "Contract"
14  ORDER BY
15    "Churn Rate (%)" DESC;
```

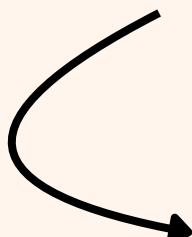


Result Grid | Filter Rows: Export: Wrap Cell Content:

	Contract	Churned Customers	Total Customers	Churn Rate (%)
▶	Month-to-Month	441	542	81.37
	One Year	29	267	10.86
	Two Year	6	339	1.78

# Average monthly charges for customers who have multiple lines and streaming TV

```
1 -- Calculate the average monthly charges for customers who have multiple lines and streaming TV
2 • select Round(avg(`Monthly Charge`),2) As 'Monthly_Charge',
3   'Multiple Lines',
4   'Streaming TV'
5   from churn.telecom_churn
6   where 'Multiple Lines' = 'Yes'
7   And
8   'Streaming TV' = 'Yes'
9   group by
10  'Multiple Lines',
11  'Streaming TV'
12
```



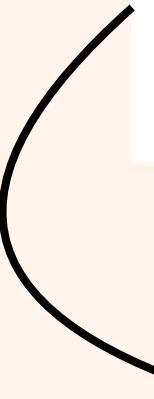
	Monthly_Charge	Multiple Lines	Streaming TV
1	95.63	Yes	Yes

# Identify the customers who have churned and used the most online services

```
1      -- Identify the customers who have churned and used the
2 • SELECT
3
4      'Customer ID',
5      'Online Security',
6      'Online Backup',
7      'Device Protection Plan',
8      'Premium Tech Support',
9      'Streaming TV',
10     'Streaming Movies',
11     'Streaming Music',
12     'Unlimited Data',
13     ('Online Security' = 'Yes') +
14     ('Online Backup' = 'Yes') +
15     ('Device Protection Plan' = 'Yes') +
16     ('Premium Tech Support' = 'Yes') +
17     ('Streaming TV' = 'Yes') +
18     ('Streaming Movies' = 'Yes') +
19     ('Streaming Music' = 'Yes') +
20     ('Unlimited Data' = 'Yes') AS 'Online Services Count'
21 FROM
22     churn.telecom_churn
23 WHERE
24     'CustomerStatus' = 'Churned'
25 ORDER BY
26     'Online Services Count' DESC
27 LIMIT 20;
```

# Average age and total charges for customers with different combinations of streaming services

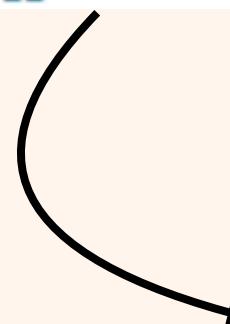
```
1 -- Calculate the average age and total charges for customers with different combinations of streaming services
2 • SELECT
3     `Streaming TV`,
4     `Streaming Movies`,
5     `Streaming Music`,
6     ROUND(AVG(`Age`), 2) AS `Avg Age`,
7     ROUND(SUM(`Total Charges`), 2) AS `Total Charges`
8 FROM
9     churn.telecom_churn
10 GROUP BY
11     `Streaming TV`,
12     `Streaming Movies`,
13     `Streaming Music`;
```



	Streaming TV	Streaming Movies	Streaming Music	Avg Age	Total Charges
	No	Yes	Yes	44.25	1758572.85
	No	No	No	48.20	2763243.3
	Yes	Yes	No	73.34	1142243
	Yes	Yes	Yes	43.96	7116494
	No	Yes	No	73.05	257638.05
	No	No		42.77	1012444.44
	No	No	Yes	24.18	95925.3
	Yes	No	Yes	23.25	62676.1

# Identify the gender distribution among customers who have churned and are on yearly contracts

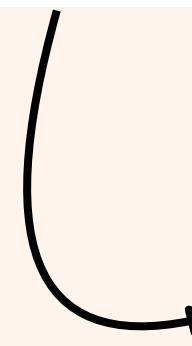
```
1  -- Identify the gender distribution among customers who have churned and are on yearly contracts
2 • SELECT
3   `Gender`,
4   COUNT(*) AS `Number of Churned Customers`
5 FROM
6   churn.telecom_churn
7 WHERE
8   `CustomerStatus` = 'Churned' AND
9   `Contract` IN ('One Year', 'Two Year')
10 GROUP BY
11   `Gender`;
```



Result Grid		Filter Rows:
	Gender	Number of Churned Customers
▶	Male	117
	Female	97

# Average monthly charges and total charges for customers who have churned, grouped by contract type and internet service type

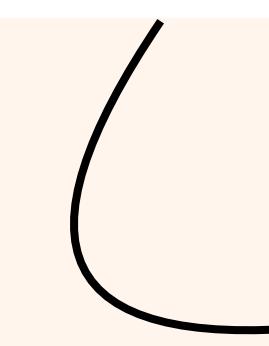
```
1 -- Calculate the average monthly charges and total charges for customers who have churned, grouped by contract type and internet service type
2
3 • SELECT
4     `Contract`,
5     `Internet Service`,
6     ROUND(AVG(`Monthly Charge`), 2) AS `Avg Monthly Charges`,
7     ROUND(SUM(`Total Charges`), 2) AS `Total Charges`
8 FROM
9     churn.telecom_churn
10 WHERE
11     `CustomerStatus` = 'Churned'
12 GROUP BY
13     `Contract`,
14     `Internet Service`;
```



	Contract	Internet Service	Avg Monthly Charges	Total Charges
▶	Month-to-Month	Yes	75.12	1917233.05
	One Year	Yes	88.71	670198.95
	Month-to-Month	No	19.36	9949.2
	One Year	No	21.14	4792.25
	Two Year	No	22.7	4911.5
	Two Year	Yes	94.23	255841.95

# Customers who have churned and are not using online services, and their average total charges

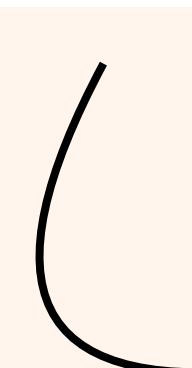
```
1 -- Find the customers who have churned and are not using online services, and their average total charges
2 • SELECT
3   `Customer ID`,
4   ROUND(AVG(`Total Charges`), 2) AS `Avg Total Charges`
5 FROM
6   churn.telecom_churn
7 WHERE
8   `CustomerStatus` = 'Churned' AND
9   (`Online Security` = 'No' AND
10  `Online Backup` = 'No' AND
11  `Premium Tech Support` = 'No')
12 GROUP BY
13   `Customer ID`;
```



	Customer ID	Avg Total Charges
▶	0004-TLHLJ	280.85
	0023-HGHWL	25.1
	0031-PVLZI	76.35
	0107-WESLM	19.85
	0107-YHINA	99.75
	0122-OAHPZ	511.25
	0137-UDEUO	63.75
	0148-DCDOS	2362.1
	0151-ONTOV	70.9
	0195-IESCP	855.3
	0196-VULGZ	474.9

# Average monthly charges and total charges for customers who have churned, grouped by the number of dependents

```
1 -- Calculate the average monthly charges and total charges for customers who have churned, grouped by the number of dependents
2 • SELECT
3     `Number of Dependents`,
4     ROUND(AVG(`Monthly Charge`), 2) AS `Avg Monthly Charges`,
5     ROUND(SUM(`Total Charges`), 2) AS `Total Charges`
6 FROM
7     churn.telecom_churn
8 WHERE
9     `CustomerStatus` = 'Churned'
10 GROUP BY
11     `Number of Dependents`;
```

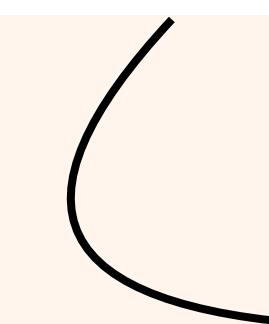


The Result Grid displays the output of the SQL query. It has four columns: Number of Dependents, Avg Monthly Charges, and Total Charges. The data shows that as the number of dependents increases, both average monthly charges and total charges decrease.

	Number of Dependents	Avg Monthly Charges	Total Charges
0	74.22	2780711.6	
1	64.1	44301.95	
2	60.98	20114.4	
3	51.7	16312.2	
4	95	655.5	
6	34.5	279.25	
7	19.25	19.25	
5	47.38	532.75	

# Customers who have churned, and their contract duration in months (for monthly contracts)

```
1 -- Identify the customers who have churned, and their contract duration in months (for monthly contracts)
2
3 • SELECT
4     `Customer ID`,
5     `Tenure in Months` AS `Contract Duration (Months)`
6 FROM
7     churn.telecom_churn
8 WHERE
9     `CustomerStatus` = 'Churned'
10    AND `Contract` = 'Month-to-Month';
11
```



	Customer ID	Contract Duration (Months)
▶	0004-TLHLJ	4
	0011-IGKFF	13
	0013-EXCHZ	3
	0023-HGHWL	1
	0023-XUOPT	13
	0031-PVLZI	4
	0032-PGELS	1
	0067-DKWBL	2
	0093-XWZFY	40
	0094-OIFMO	11
	0107-WESLM	1

# Average age and total charges for customers who have churned, grouped by internet service and phone service

```
1      -- Determine the average age and total charges for customers who have churned, grouped by internet service and phone service
2 •  SELECT
3      `Internet Service`,
4      `Phone Service`,
5      ROUND(AVG(`Age`), 2) AS `Average Age`,
6      ROUND(SUM(`Total Charges`), 2) AS `Total Charges`
7  FROM
8      churn.telecom_churn
9  WHERE
10     `CustomerStatus` = 'Churned'
11 GROUP BY
12     `Internet Service`,
13     `Phone Service`;
14
```



Result Grid | Filter Rows: Export:

	Internet Service	Phone Service	Average Age	Total Charges
▶	Yes	Yes	50.17	2726469
	Yes	No	49.89	116804.95
	No	Yes	43.47	19652.95

# View to find the customers with the highest monthly charges in each contract type

```
1  -- Create a view to find the customers with the highest monthly charges in each contract type
2
3 • SET @@global.net_read_timeout=600;
4 • SET @@global.net_write_timeout=600;
5 • SET @@global.wait_timeout=600;
6
7 • SELECT
8     `Contract`,
9     MAX(`Monthly Charge`) AS MaxCharge
10    FROM churn.telecom_churn
11   GROUP BY `Contract`;
12
13 • SELECT
14     t1.`Customer ID`,
15     t1.`Contract`,
```

```
16     t1.`Monthly Charge`
17    FROM
18      churn.telecom_churn AS t1
19  • INNER JOIN (
20    SELECT
21      `Contract`,
22      MAX(`Monthly Charge`) AS MaxCharge
23    FROM churn.telecom_churn
24   GROUP BY `Contract`
25  ) AS t2
26    ON t1.`Contract` = t2.`Contract` AND t1.`Monthly Charge` = t2.MaxCharge;
27
28 • CREATE OR REPLACE VIEW HighestMonthlyChargesByContract AS
29   SELECT
30     t1.`Customer ID`,
```

```
31     t1.`Contract`,
32     t1.`Monthly Charge`
33    FROM
34      churn.telecom_churn AS t1
35  • INNER JOIN (
36    SELECT
37      `Contract`,
38      MAX(`Monthly Charge`) AS MaxCharge
39    FROM churn.telecom_churn
40   GROUP BY `Contract`
41  ) AS t2
42    ON t1.`Contract` = t2.`Contract` AND t1.`Monthly Charge` = t2.MaxCharge;
43
44 • SELECT * FROM HighestMonthlyChargesByContract;
```

Result Grid | Filter Rows:

	Customer ID	Contract	Monthly Charge
▶	2302-ANTDP	Month-to-Month	117.45
	5734-EJKXG	One Year	118.6
	7569-NMZYQ	Two Year	118.75

# View to identify customers who have churned and the average monthly charges compared to the overall average

```
1 -- Create a view to identify customers who have churned and the average monthly charges compared to the overall average
2 • SHOW FULL TABLES IN churn WHERE TABLE_TYPE LIKE 'VIEW';
3 • USE churn;
4
5 • CREATE OR REPLACE VIEW `ChurnedCustomersWithAvgMonthlyCharges` AS
6 SELECT
7     `Customer ID`,
8     `Monthly Charge`,
9     `CustomerStatus`,
10    (SELECT AVG(`Monthly Charge`)
11     FROM churn.telecom_churn) AS `OverallAvgMonthlyCharge`,
12    ROUND((`Monthly Charge` -
13        (SELECT AVG(`Monthly Charge`)
14         FROM churn.telecom_churn)), 2) AS `DifferenceFromOverallAvg`
15   FROM
16
17      FROM
18      churn.telecom_churn
19
20 •     WHERE
21
22     `CustomerStatus` = 'Churned';
23
24
25 •     SELECT * FROM `churnedCustomersWithAvgMonthlyCharges`;
26
27
```



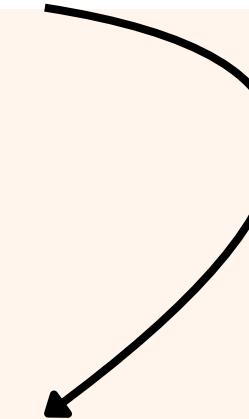
Customer ID	Monthly Charge	CustomerStatus	OverallAvgMonthlyCharge	DifferenceFromOverallAvg
0004-TLHLJ	73.9	Churned	63.59613091012355	10.3
0011-IGKFF	98	Churned	63.59613091012355	34.4
0013-EXCHZ	83.9	Churned	63.59613091012355	20.3
0022-TCJCI	62.7	Churned	63.59613091012355	-0.9

# View to find the customers who have churned and their cumulative total charges over time

```
1 -- Create a view to find the customers who have churned and their cumulative total charges over time
2
3 • USE churn;
4
5 • SHOW FULL TABLES IN churn WHERE TABLE_TYPE LIKE 'VIEW';
6
7 • USE churn;
8
9 • CREATE OR REPLACE VIEW ChurnedCustomersCumulativeCharges AS
10 SELECT
11     `Customer ID`,
12     `Total Charges`,
13     `CustomerStatus`,
14     SUM(`Total Charges`) OVER (ORDER BY `Customer ID` ROWS BETWEEN UNBOUNDED PRECEDING AND CURRENT ROW) AS `CumulativeTotalCharges`
15     FROM
16         churn.telecom_churn
17     WHERE
18         `CustomerStatus` = 'Churned';
19
20 • SHOW FULL TABLES IN churn WHERE TABLE_TYPE LIKE 'VIEW';
21
22 • SELECT * FROM ChurnedCustomersCumulativeCharges;
23
```

Result Grid | Filter Rows: Export: Wrap Cell Content:

	Customer ID	Total Charges	CustomerStatus	CumulativeTotalCharges
▶	0004-TLHLJ	280.85	Churned	280.85
	0011-IGKFF	1237.85	Churned	1518.699999999998
	0013-EXCHZ	267.4	Churned	1786.1
	0022-TCJCI	2791.5	Churned	4577.6
	0023-HGHWL	25.1	Churned	4602.700000000001
	0023-XUOPT	1215.6	Churned	5818.300000000001
	0031-PVLZI	76.35	Churned	5894.6500000000015
	0032-PGELS	30.5	Churned	5925.1500000000015
	0067-DKWBL	91.1	Churned	6016.250000000002
	0093-XWZFY	4036.85	Churned	10053.100000000002
	0094-OIFMO	1120.3	Churned	11173.400000000001
	0107-WESLM	19.85	Churned	11193.250000000002
	0107-YHINA	99.75	Churned	11293.000000000002
	0112-QWPNC	4059.35	Churned	15352.350000000002
	0115-TFERT	2317.1	Churned	17669.45



# Stored Procedure to Calculate Churn Rate

```
1  -- Stored Procedure to Calculate Churn Rate
2
3  DELIMITER $$*
4
5 • CREATE PROCEDURE CalculateChurnRate()
6  BEGIN
7      -- Declare variables to hold the count of total and churned customers
8      DECLARE total_customers INT;
9      DECLARE churned_customers INT;
10     DECLARE churn_rate DECIMAL(5,2);
11
12      -- Calculate the total number of customers
13      SELECT COUNT(*) INTO total_customers
14      FROM churn.telecom_churn;
15
16      -- Calculate the number of churned customers
17      SELECT COUNT(*) INTO churned_customers
18      FROM churn.telecom_churn;
```

```
19      WHERE `CustomerStatus` = 'Churned';
20
21      -- Calculate the churn rate
22      SET churn_rate = (churned_customers / total_customers) * 100;
23
24      -- Output the churn rate
25      SELECT CONCAT('Churn Rate: ', churn_rate, '%') AS ChurnRate;
26
27  END $$*
28
29  DELIMITER ;
```

--  
31 • CALL CalculateChurnRate();

32

Result Grid	
	ChurnRate
▶	Churn Rate: 26.54%

# Stored Procedure to Identify High-Value Customers at Risk of Churning

```
1  -- Stored Procedure to Identify High-Value Customers at Risk of Churning
2
3  DELIMITER $$

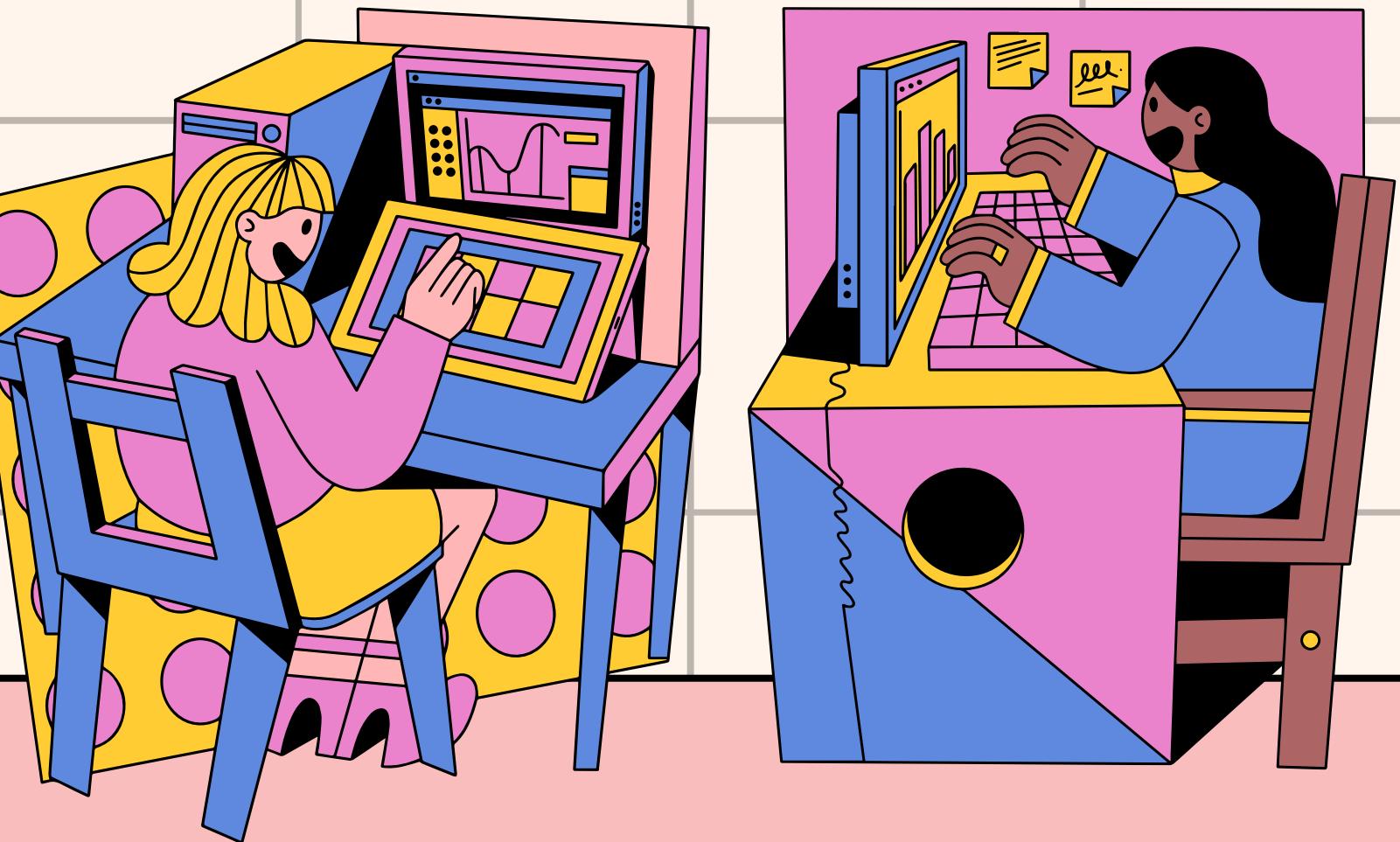
4
5 • CREATE PROCEDURE IdentifyHighValueCustomersAtRisk()
6  BEGIN
7      -- Declare a temporary table to hold results
8      CREATE TEMPORARY TABLE IF NOT EXISTS HighValueCustomersAtRisk (
9          `Customer ID` VARCHAR(50),
10         `Total Charges` DECIMAL(10,2),
11         `CustomerStatus` VARCHAR(50)
12     );
13 
```

```
26      -- Output the results
27      SELECT * FROM HighValueCustomersAtRisk;
28
29      -- Drop the temporary table
30      DROP TEMPORARY TABLE IF EXISTS HighValueCustomersAtRisk;
31  END $$

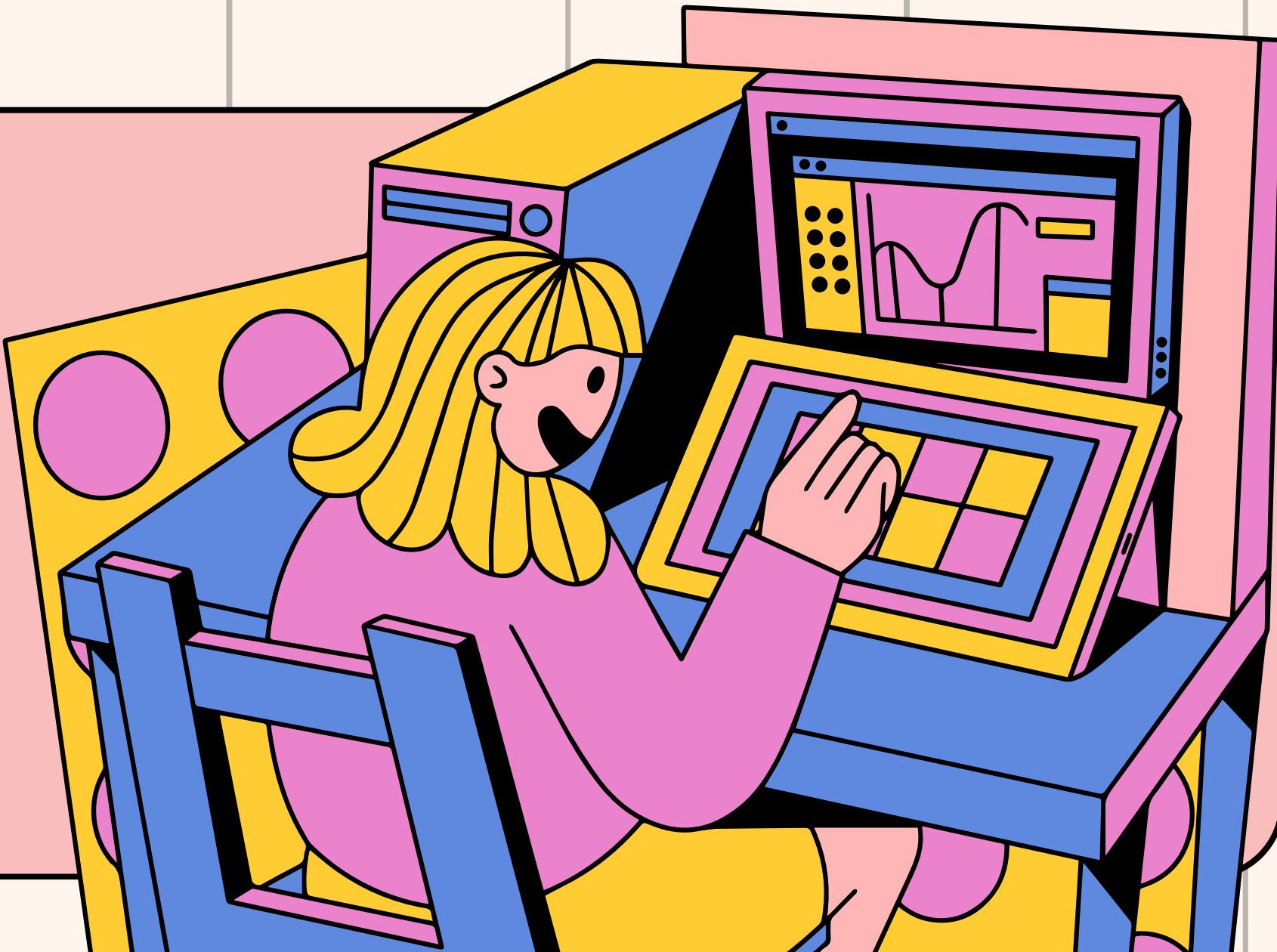
32
33  DELIMITER ;
34
35 • CALL IdentifyHighValueCustomersAtRisk();
```

Customer ID	Total Charges	CustomerStatus
0011-IGKFF	1237.85	Churned
0013-SMEOE	7904.25	Stayed
0014-BMAQU	5377.80	Stayed
0016-QLJIS	5957.90	Stayed
0017-DINOC	2460.55	Stayed
0017-IUDMW	8456.75	Stayed
0019-EFAEP	7261.25	Stayed
0019-GFNTW	2560.10	Stayed
0020-INWCK	6849.40	Stayed
0020-JDNXP	1993.20	Stayed
0022-TCJCI	2791.50	Churned
0023-UYUPN	1306.30	Stayed
0023-XUOPT	1215.60	Churned
0027-KWYKW	1849.95	Stayed
0036-IHMOT	5656.75	Stayed

```
-- Insert high-value customers at risk of churning into the temporary table
INSERT INTO HighValueCustomersAtRisk (`Customer ID`, `Total Charges`, `CustomerStatus`)
SELECT
    `Customer ID`,
    `Total Charges`,
    `CustomerStatus`
FROM
    churn.telecom_churn
WHERE
    `Total Charges` > 1000 -- Adjust this threshold as needed
    AND (`CustomerStatus` = 'Churned' OR `Churn Reason` IS NOT NULL); -- Define risk criteria
```



# Recommendations



- **Develop Targeted Retention Offers for Month-to-Month Customers**
- **Implement Loyalty Programs for High-Value Customers**
- **Address Pricing Concerns with Competitive and Flexible Pricing Models**
- **Improve Service Quality and Experience for Heavy Online Service Users**
- **Promote Automatic Payments to Reduce Churn Rates**



# References

- Data source: “Guvi Team”
- Tools used: SQL, Python, Power BI, etc.
- Research references: Wikipedia, Geeks for Geeks, AI Tools



# Conclusion



**The telecom churn analysis provided valuable insights into customer behavior and the key factors driving churn. It was found that customers on month-to-month contracts, heavy service users, and those dissatisfied with pricing were the most likely to leave the service.**

**Additionally, high-value customers, particularly those with significant total charges, were identified as at-risk for churn. This analysis highlights the importance of targeted retention strategies, competitive pricing, and improving the onboarding experience to reduce churn rates.**

**By addressing the specific needs of these customer segments and implementing personalized retention campaigns, the company can enhance customer satisfaction and improve long-term loyalty.**

# Thank You For Your Attention

