Customer Churn Analysis in SQL

Dataset:https://www.mavenanalytics.io/data-playground?page=2&pageSize=5

Customer Demographics

Customers by Gender

```
SELECT Gender, COUNT(*) AS CustomerCount
FROM dbo.telecom_customer_churn
GROUP BY Gender;
```

100 %

Results | Messages

	Gender	CustomerCount
1	Male	3555
2	Female	3488

Average age of customers

```
SELECT AVG(Age) as AverageAge
FROM dbo.telecom_customer_churn
```

100 %

Results | Messages

	AverageAge
1	46

Customers by Marital Status:

```
SELECT Married, COUNT(*) AS CustomerCount
FROM dbo.telecom_customer_churn
GROUP BY Married;
```

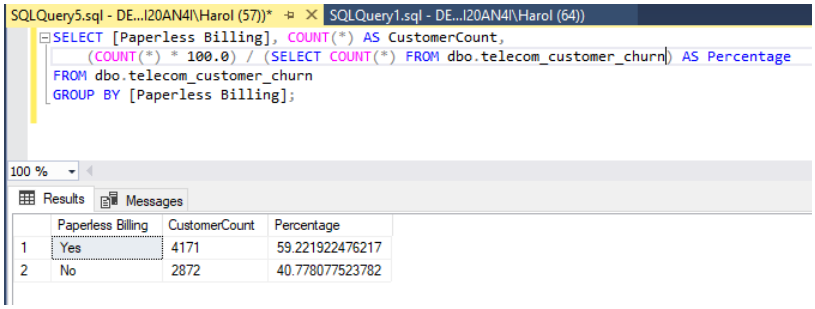
100 %

Results | Messages

	Married	CustomerCount
1	Yes	3402
2	No	3641

Billing

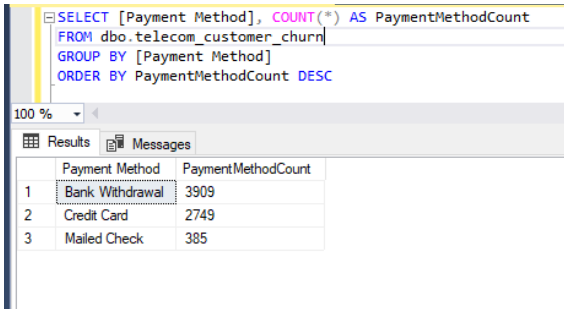
Percentage of Customers with Paperless Billing:



```
SELECT [Paperless Billing], COUNT(*) AS CustomerCount,
    (COUNT(*) * 100.0) / (SELECT COUNT(*) FROM dbo.telecom_customer_churn) AS Percentage
FROM dbo.telecom_customer_churn
GROUP BY [Paperless Billing];
```

	Paperless Billing	CustomerCount	Percentage
1	Yes	4171	59.221922476217
2	No	2872	40.778077523782

Most Common Payment Method:

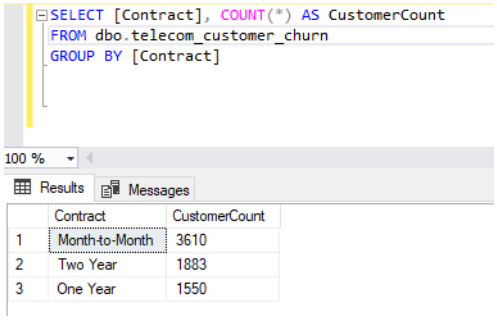


```
SELECT [Payment Method], COUNT(*) AS PaymentMethodCount
FROM dbo.telecom_customer_churn
GROUP BY [Payment Method]
ORDER BY PaymentMethodCount DESC
```

	Payment Method	PaymentMethodCount
1	Bank Withdrawal	3909
2	Credit Card	2749
3	Mailed Check	385

Contract Analysis

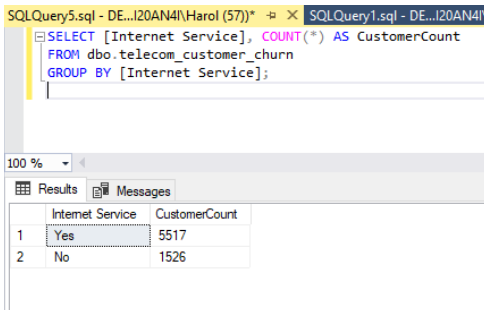
Customers by Contract Length:



```
SELECT [Contract], COUNT(*) AS CustomerCount
FROM dbo.telecom_customer_churn
GROUP BY [Contract]
```

	Contract	CustomerCount
1	Month-to-Month	3610
2	Two Year	1883
3	One Year	1550

Customers with Internet Service:



```
SELECT [Internet Service], COUNT(*) AS CustomerCount
FROM dbo.telecom_customer_churn
GROUP BY [Internet Service];
```

	Internet Service	CustomerCount
1	Yes	5517
2	No	1526

CHURN ANALYSIS

Overall Churn Rate

```
SELECT
    COUNT(*) AS TotalCustomers,
    SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
    ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_customer_churn;
```

100 %

Results | Messages

	TotalCustomers	Churned Customers	ChurnRate
1	7043	1869	26.540000000000

Churn Rate by Gender

```
SELECT
    Gender,
    COUNT(*) AS TotalCustomers,
    SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
    ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_customer_churn
GROUP BY Gender;
```

100 %

Results | Messages

	Gender	TotalCustomers	Churned Customers	ChurnRate
1	Male	3555	930	26.160000000000
2	Female	3488	939	26.920000000000

Most Common Churn Reasons

```
SELECT [Churn Reason], COUNT(*) AS ChurnReasonCount
FROM dbo.telecom_customer_churn
WHERE [Customer Status] = 'Churned' AND [Churn Reason] IS NOT NULL
GROUP BY [Churn Reason]
ORDER BY ChurnReasonCount DESC;
```

100 %

Results | Messages

	Churn Reason	ChurnReasonCount
1	Competitor had better devices	313
2	Competitor made better offer	311
3	Attitude of support person	220
4	Don't know	130
5	Competitor offered more data	117
6	Competitor offered higher download speeds	100
7	Attitude of service provider	94
8	Price too high	78
9	Product dissatisfaction	77
10	Network reliability	72
11	Long distance charges	64
12	Service dissatisfaction	63
13	Moved	46
14	Extra data charges	39
15	Limited range of services	37
16	Poor expertise of online support	31
17	Lack of affordable download/upload speed	30
18	Lack of self-service on Website	29
19	Poor expertise of phone support	12
20	Deceased	6

Churn Rate by Contract Type

```
SELECT
    Contract,
    COUNT(*) AS TotalCustomers,
    SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
    ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY Contract;
```

100 %

Results | Messages

	Contract	TotalCustomers	Churned Customers	Churn Rate
1	Month-to-Month	3610	1655	45.840000000000
2	Two Year	1883	48	2.550000000000
3	One Year	1550	166	10.710000000000

Churn Status by Payment Method

```
SELECT
    [Payment Method],
    COUNT(*) AS TotalCustomers,
    SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
    ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY [Payment Method];
```

100 %

Results | Messages

	Payment Method	TotalCustomers	Churned Customers	Churn Rate
1	Credit Card	2749	398	14.480000000000
2	Bank Withdrawal	3909	1329	34.000000000000
3	Mailed Check	385	142	36.880000000000

Cities by Churn Rate

```
SELECT City, COUNT(*) AS ChurnCount
FROM dbo.telecom_customer_churn
WHERE [Customer Status] = 'Churned'
GROUP BY City
ORDER BY ChurnCount DESC
```

100 %

Results | Messages

	City	ChurnCount
1	San Diego	185
2	Los Angeles	78
3	San Francisco	31
4	San Jose	29
5	Sacramento	26
6	Fallbrook	26
7	Temecula	22
8	Escondido	16
9	Long Beach	15
10	Oakland	13

Churn Rate by Total Charges

```sql
WITH ChurnSummary AS (
    SELECT [Customer ID],
           ROUND([Total Charges] + [Total Extra Data Charges] + [Total Long Distance Charges], 2) AS TotalCharges,
           CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END AS IsChurned
    FROM telecom_customer_churn
),
TotalChargesBins AS (
    SELECT TotalCharges,
           FLOOR((TotalCharges - 20) / 100) * 100 AS ChargeBin,
           IsChurned
    FROM ChurnSummary
)
SELECT ChargeBin,
       COUNT(*) AS TotalCustomers,
       SUM(IsChurned) AS ChurnedCustomers,
       ROUND(100.0 * SUM(IsChurned) / COUNT(*), 2) AS ChurnRate
FROM TotalChargesBins
GROUP BY ChargeBin
ORDER BY ChargeBin;
```

100 %

Results | Messages

	ChargeBin	TotalCustomers	ChurnedCustomers	ChurnRate
1	0	698	386	55.300000000000
2	100	294	131	44.560000000000
3	200	234	93	39.740000000000
4	300	211	75	35.550000000000
5	400	182	73	40.110000000000
6	500	162	49	30.250000000000
7	600	139	50	35.970000000000
8	700	151	43	28.480000000000
9	800	152	43	28.290000000000
10	900	152	47	30.920000000000

Churn Rate by Offer Type

```sql
SELECT
    [Offer],
    COUNT(*) AS [Total Customers],
    SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
    ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM dbo.telecom_customer_churn
GROUP BY [Offer]
ORDER BY [Churn Rate] DESC
```

100 %

Results | Messages

	Offer	Total Customers	Churned Customers	Churn Rate
1	Offer E	805	426	52.920000000000
2	None	3877	1051	27.110000000000
3	Offer D	602	161	26.740000000000
4	Offer C	415	95	22.890000000000
5	Offer B	824	101	12.260000000000
6	Offer A	520	35	6.730000000000

Churn Rate by Tenure

```sql
SELECT
    CASE
        WHEN [Tenure in Months] <= 6 THEN '0-6 Months'
        WHEN [Tenure in Months] <= 12 THEN '7-12 Months'
        ELSE '13+ Months'
    END AS [Tenure Range],
    COUNT(*) AS [Total Customers],
    SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
    ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY
    CASE
        WHEN [Tenure in Months] <= 6 THEN '0-6 Months'
        WHEN [Tenure in Months] <= 12 THEN '7-12 Months'
        ELSE '13+ Months'
    END;
```

100 %

Results | Messages

	Tenure Range	Total Customers	Churned Customers	Churn Rate
1	13+ Months	4857	832	17.130000000000
2	7-12 Months	716	253	35.340000000000
3	0-6 Months	1470	784	53.330000000000

Phone Service Usage and Churn Rate

```sql
SELECT [Phone Service],
       COUNT(*) AS [Total Customers],
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS ChurnedCustomers,
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_customer_churn
GROUP BY [Phone Service];
```

100 %

Results | Messages

	Phone Service	Total Customers	ChurnedCustomers	ChurnRate
1	Yes	6361	1699	26.710000000000
2	No	682	170	24.930000000000

Internet Service Type and Churn Rate

```sql
SELECT [Internet Type],
       COUNT(*) AS TotalCustomers,
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY [Internet Type]
ORDER BY [Churn Rate] DESC;
```

100 %

Results | Messages

	Internet Type	TotalCustomers	Churned Customers	Churn Rate
1	Fiber Optic	3035	1236	40.720000000000
2	Cable	830	213	25.660000000000
3	DSL	1652	307	18.580000000000
4		1526	113	7.400000000000

Streaming Service Usage and Churn Rate

```sql
SELECT [Streaming TV], [Streaming Movies], [Streaming Music],
       COUNT(*) AS [Total Customers],
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY [Streaming TV], [Streaming Movies], [Streaming Music]
ORDER BY [Churn Rate] DESC;
```

100 %

Results | Messages

	Streaming TV	Streaming Movies	Streaming Music	Total Customers	Churned Customers	Churn Rate
1	Yes	No	Yes	32	23	71.880000000000
2	No	No	Yes	99	64	64.650000000000
3	No	Yes	No	105	56	53.330000000000
4	Yes	Yes	No	270	121	44.810000000000
5	No	No	No	1919	631	32.880000000000
6	Yes	No	No	735	220	29.930000000000
7	No	Yes	Yes	687	191	27.800000000000
8	Yes	Yes	Yes	1670	450	26.950000000000
9				1526	113	7.400000000000

Online Security/Backup and Churn Rate

```sql
SELECT [Online Security], [Online Backup],
       COUNT(*) AS [Total Customers],
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY [Online Security], [Online Backup]
ORDER BY [Churn Rate] DESC;
```

100 %

Results | Messages

	Online Security	Online Backup	Total Customers	Churned Customers	Churn Rate
1	No	No	2195	1057	48.150000000000
2	No	Yes	1303	404	31.010000000000
3	Yes	No	893	176	19.710000000000
4	Yes	Yes	1126	119	10.570000000000
5			1526	113	7.400000000000

Customer Distribution by City

```sql
SELECT City,
       COUNT(*) AS [Total Customers],
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS [Churned Customers],
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS [Churn Rate]
FROM telecom_customer_churn
GROUP BY City
ORDER BY [Total Customers] DESC;
```

100 %

Results | Messages

	City	Total Customers	Churned Customers	Churn Rate
1	Los Angeles	293	78	26.620000000000
2	San Diego	285	185	64.910000000000
3	San Jose	112	29	25.890000000000
4	Sacramento	108	26	24.070000000000
5	San Francisco	104	31	29.810000000000
6	Fresno	61	13	21.310000000000
7	Long Beach	60	15	25.000000000000
8	Oakland	52	13	25.000000000000
9	Escondido	51	16	31.370000000000
10	Stockton	44	12	27.270000000000
11	Fallbrook	43	26	60.470000000000
12	Glendale	40	13	32.500000000000

Customer Distribution by ZIP Code

```sql
SELECT tcc.[Zip Code], tzp.Population,
       COUNT(*) AS TotalCustomers,
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS ChurnedCustomers,
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_customer_churn tcc
LEFT JOIN telecom_zipcode_population tzp ON tcc.[Zip Code] = tzp.[Zip Code]
GROUP BY tcc.[Zip Code], tzp.Population
ORDER BY TotalCustomers DESC;
```

100 %

Results | Messages

	Zip Code	Population	TotalCustomers	ChurnedCustomers	ChurnRate
1	92028	42239	43	26	60.470000000000
2	92027	48690	38	15	39.470000000000
3	92122	34902	36	33	91.670000000000
4	92117	51213	34	30	88.240000000000
5	92126	74232	32	28	87.500000000000
6	92592	46171	30	18	60.000000000000
7	92109	46086	27	24	88.890000000000
8	92130	28201	22	20	90.910000000000
9	92121	4258	20	17	85.000000000000
10	92129	47224	16	15	93.750000000000
11	92173	30870	9	7	77.780000000000

Correlation between Latitude/Longitude and Churn

```sql
SELECT Latitude, Longitude,
       COUNT(*) AS TotalCustomers,
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS ChurnedCustomers,
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_customer_churn
GROUP BY Latitude, Longitude
ORDER BY ChurnRate DESC;
```

100 %

Results | Messages

	Latitude	Longitude	TotalCustomers	ChurnedCustomers	ChurnRate
1	35.363339	-117.637641	2	2	100.000000000000
2	37.734971	-120.954271	4	4	100.000000000000
3	41.950683	-124.097094	4	4	100.000000000000
4	40.022184	-121.062384	4	4	100.000000000000
5	34.437945	-119.77191	4	4	100.000000000000
6	34.358321	-117.618263	4	4	100.000000000000
7	38.911577	-120.106169	2	2	100.000000000000
8	36.833002	-119.82947	1	1	100.000000000000
9	38.348884	-122.51699	2	2	100.000000000000
10	37.691561	-122.445202	4	4	100.000000000000
11	37.171727	-122.142961	4	4	100.000000000000

Miscellaneous

Population Analysis

```
SELECT TZP.[Zip Code], TZP.Population,
       COUNT(*) AS TotalCustomers,
       SUM(CASE WHEN TCC.[Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS ChurnedCustomers,
       ROUND(100.0 * SUM(CASE WHEN tcc.[Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_zipcode_population AS TZP
LEFT JOIN telecom_customer_churn tcc ON TZP.[Zip Code] = TCC.[Zip Code]
GROUP BY TZP.[Zip Code], TZP.Population
ORDER BY CONVERT(INT, TZP.Population) DESC;
```

100 %

Results | Messages

	Zip Code	Population	TotalCustomers	ChurnedCustomers	ChurnRate
1	90201	105285	5	0	0.000000000000
2	90650	103214	5	0	0.000000000000
3	90011	101215	5	1	20.000000000000
4	92054	98239	5	0	0.000000000000
5	91331	97318	5	2	40.000000000000
6	90280	96267	5	0	0.000000000000
7	90250	93315	5	1	20.000000000000
8	90805	91664	5	1	20.000000000000
9	92704	91188	4	0	0.000000000000
10	94509	90891	4	2	50.000000000000

Referral Analysis

```
SELECT [Number of Referrals],
       COUNT(*) AS TotalCustomers,
       SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) AS ChurnedCustomers,
       ROUND(100.0 * SUM(CASE WHEN [Customer Status] = 'Churned' THEN 1 ELSE 0 END) / COUNT(*), 2) AS ChurnRate
FROM telecom_customer_churn
GROUP BY [Number of Referrals]
ORDER BY ChurnRate;
```

100 %

Results | Messages

	Number of Referrals	TotalCustomers	ChurnedCustomers	ChurnRate
1	10	223	0	0.000000000000
2	11	2	0	0.000000000000
3	8	213	2	0.940000000000
4	9	238	4	1.680000000000
5	7	248	6	2.420000000000
6	6	221	8	3.620000000000
7	4	236	18	7.630000000000
8	5	264	21	7.950000000000
9	2	236	26	11.020000000000
10	3	255	32	12.550000000000
11	0	3821	1245	32.580000000000
12	1	1086	507	46.690000000000