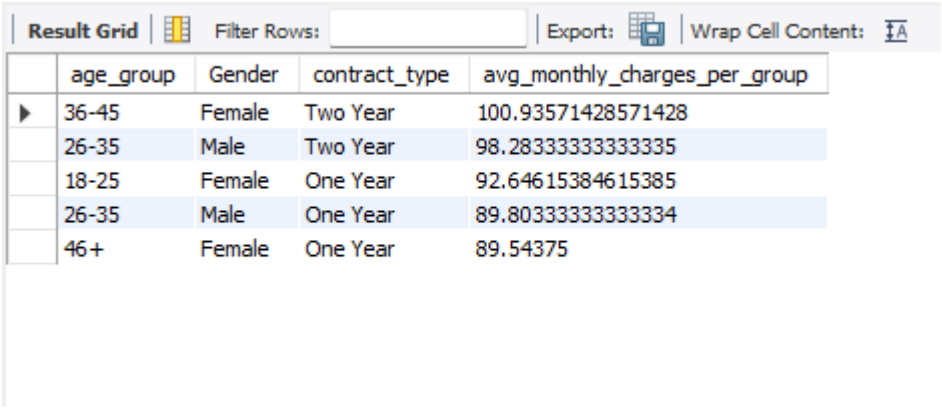
IBM’s Telco Customer Churn Analysis

SQL Queries and their explanation:

Query 1: Considering the top 5 groups with the highest average monthly charges among churned customers, how can personalized offers be tailored based on age, gender, and contract type to potentially improve customer retention rates?

```
WITH churned_customers AS (
  SELECT a.`Customer ID`,
        a.`Contract` AS contract_type,
        AVG(a.`Monthly Charge`) AS average_monthly_charges,
        b.`Customer Status`,
        c.`Age`,
        c.`Gender`
  FROM telco_customer_churn_services a
  JOIN telco_customer_churn_status b
    ON a.`Customer ID` = b.`Customer ID`
  JOIN telco_customer_churn_demographics c
    ON a.`Customer ID` = c.`Customer ID`
  WHERE b.`Customer Status` = 'churned'
  GROUP BY a.`Customer ID`, a.`Contract`, b.`Customer Status`, c.`Age`, c.`Gender`
)
SELECT
  CASE
    WHEN Age BETWEEN 18 AND 25 THEN '18-25'
    WHEN Age BETWEEN 26 AND 35 THEN '26-35'
    WHEN Age BETWEEN 36 AND 45 THEN '36-45'
    ELSE '46+'
  END AS age_group,
  Gender,
```

```
 contract_type,
 AVG(average_monthly_charges) AS avg_monthly_charges_per_group
FROM churned_customers
GROUP BY age_group, Gender, contract_type
ORDER BY avg_monthly_charges_per_group DESC
LIMIT 5;
```



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

age_group	Gender	contract_type	avg_monthly_charges_per_group
36-45	Female	Two Year	100.93571428571428
26-35	Male	Two Year	98.28333333333335
18-25	Female	One Year	92.64615384615385
26-35	Male	One Year	89.80333333333334
46+	Female	One Year	89.54375

Explanation:

Purpose: This query identifies the top 5 groups of churned customers based on their age, gender, and contract type that have the highest average monthly charges.

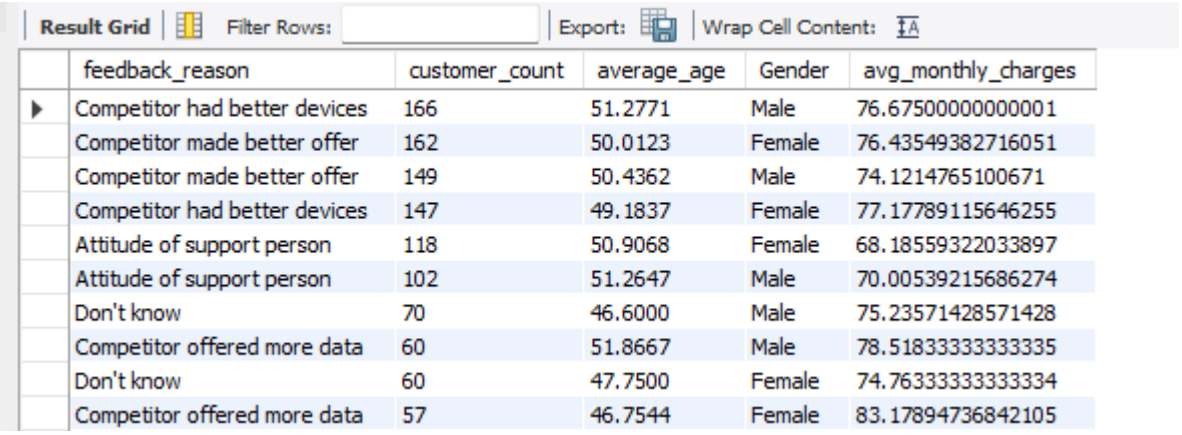
Step-by-step:

- **Common Table Expression "churned_customers"**: This subquery gathers data for customers who have churned, combining demographic data (Age and Gender), contract type, and average monthly charges.
- **Age grouping**: The age is classified into four age groups (18-25, 26-35, 36-45, 46+).
- **Aggregation**: The query then groups customers by their age group, gender, and contract type, calculating the average monthly charges for each group.
- **Sorting and limiting**: It sorts the groups by average monthly charges in descending order, showing only the top 5 groups.

Query 2: What are the feedback or complaints from those churned customers

```
WITH churned_customers AS (
 -- This part identifies all churned customers as in Query 1
 SELECT a.`Customer ID`,
      a.`Contract` AS contract_type,
```

```
        AVG(a.`Monthly Charge`) AS average_monthly_charges,
        b.`Customer Status`,
        b.`Churn Reason` AS feedback
    FROM telco_customer_churn_services a
    JOIN telco_customer_churn_status b
      ON a.`Customer ID` = b.`Customer ID`
    WHERE b.`Customer Status` = 'churned'
    GROUP BY a.`Customer ID`, a.`Contract`, b.`Customer Status`, b.`Churn Reason`
)
-- Now group by feedback to get the count of churned customers per feedback
SELECT
    c.feedback AS feedback_reason,
    COUNT(c.`Customer ID`) AS customer_count,
    AVG(d.`Age`) AS average_age,
    d.`Gender`,
    AVG(c.average_monthly_charges) AS avg_monthly_charges
FROM
    churned_customers c
JOIN
    telco_customer_churn_demographics d
ON
    c.`Customer ID` = d.`Customer ID`
GROUP BY
    c.feedback, d.`Gender`
ORDER BY
    customer_count DESC;
```



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

feedback_reason	customer_count	average_age	Gender	avg_monthly_charges
Competitor had better devices	166	51.2771	Male	76.67500000000001
Competitor made better offer	162	50.0123	Female	76.43549382716051
Competitor made better offer	149	50.4362	Male	74.1214765100671
Competitor had better devices	147	49.1837	Female	77.17789115646255
Attitude of support person	118	50.9068	Female	68.18559322033897
Attitude of support person	102	51.2647	Male	70.00539215686274
Don't know	70	46.6000	Male	75.23571428571428
Competitor offered more data	60	51.8667	Male	78.51833333333335
Don't know	60	47.7500	Female	74.76333333333334
Competitor offered more data	57	46.7544	Female	83.17894736842105

Explanation:

Purpose: This query analyzes feedback or complaints from churned customers, grouping them by their feedback, gender, age, and monthly charges to identify patterns in customer dissatisfaction.

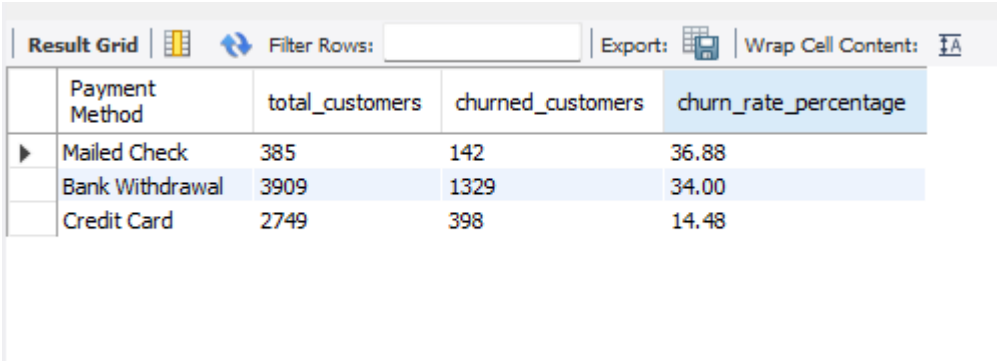
Step-by-step:

- **Common Table Expression "**churned_customers": Gathers information on churned customers, including their contract type, feedback (churn reason), and average monthly charges.
- **Joining demographics**: This CTE is then joined with the demographics table to include customer age and gender.
- **Aggregation**: The query groups churned customers by their feedback reason and gender, calculating:
  - Count of customers per feedback reason.
  - Average age and average monthly charges for each group.
- **Sorting**: It sorts the results by the number of customers per feedback reason in descending order to highlight the most common complaints.

Query 3: How does the payment method influence churn behavior?

```
SELECT
    s.`Payment Method`,
    COUNT(st.`Customer ID`) AS total_customers,
    COUNT(CASE WHEN st.`Churn Label` = 'Yes' THEN 1 END) AS churned_customers,
    ROUND(COUNT(CASE WHEN st.`Churn Label` = 'Yes' THEN 1 END) / COUNT(st.`Customer ID`) *
100, 2) AS churn_rate_percentage
FROM
    telco_customer_churn_services s
JOIN
```

```
    telco_customer_churn_status st
ON
    s.`Customer ID` = st.`Customer ID`
GROUP BY
    s.`Payment Method`
ORDER BY
    churn_rate_percentage DESC;
```



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

Payment Method	total_customers	churned_customers	churn_rate_percentage
Mailed Check	385	142	36.88
Bank Withdrawal	3909	1329	34.00
Credit Card	2749	398	14.48

Explanation:

Purpose: This query examines the effect of different payment methods on customer churn rates.

Step-by-step:

- **Grouping by Payment Method**: The query groups customers by their payment method.
- **Counting churned customers**: It counts how many customers used each payment method, and how many of them have churned (Churn Label = 'Yes').
- **Churn rate calculation**: The churn rate is calculated as the percentage of churned customers relative to the total number of customers for each payment method.
- **Sorting**: The query sorts the results in descending order by churn rate percentage to identify which payment methods have the highest churn rates.