Data Analysis & Insights On Clients Mortgage Data

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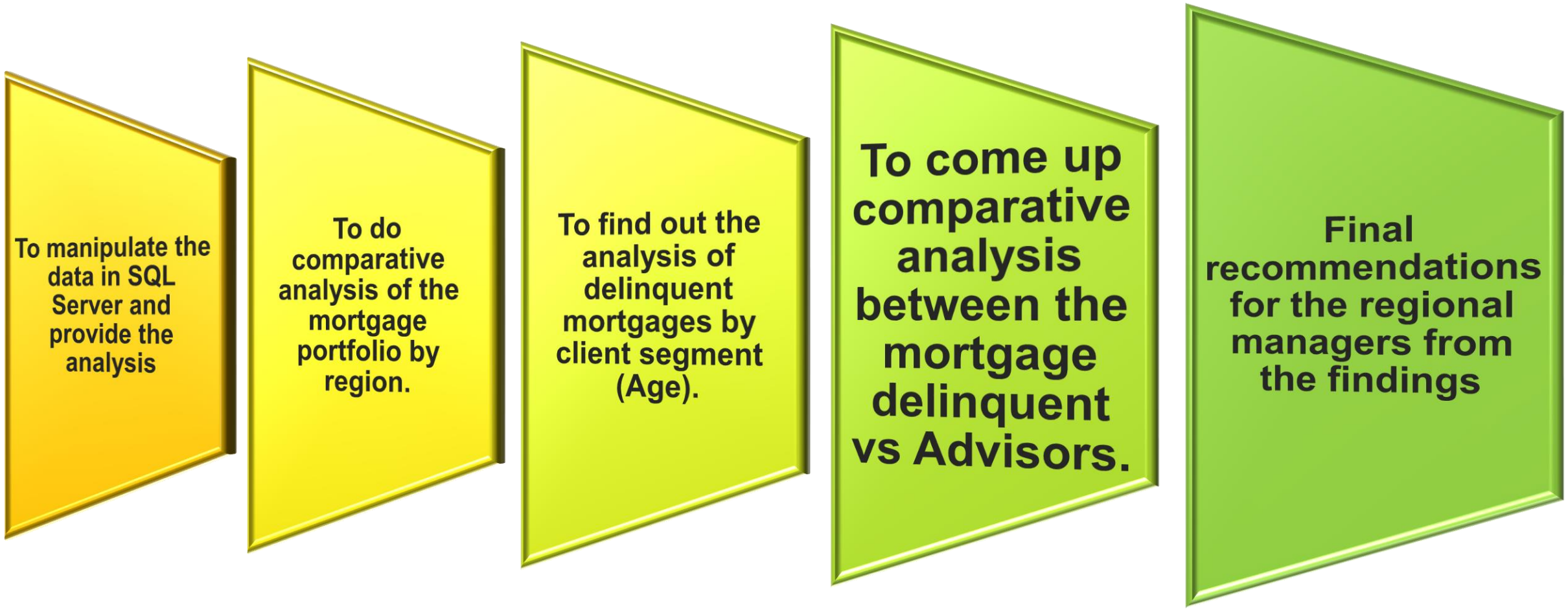
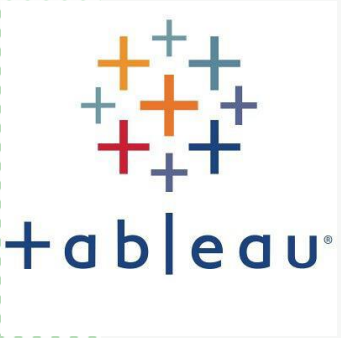
Contents

Objectives


To manipulate the data in SQL Server and provide the analysis
To do comparative analysis of the mortgage portfolio by region.
To find out the analysis of delinquent mortgages by client segment (Age).
To come up comparative analysis between the mortgage delinquent vs Advisors.
Final recommendations for the regional managers from the findings

Methodology



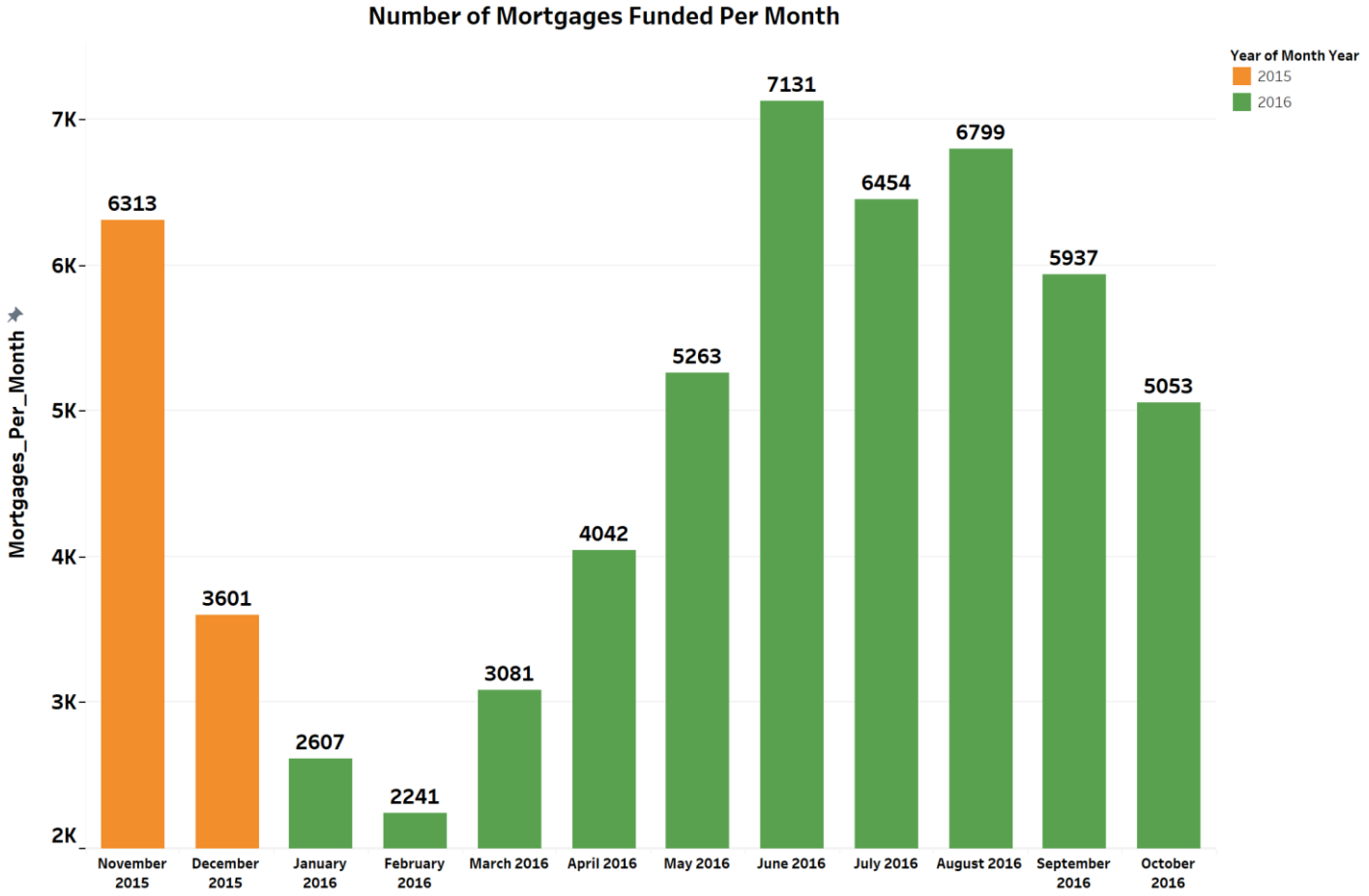
- Data is manipulated in SQL Server.
- Tableau is used for analysis & visualization.
- Output of Queries from SQL Server is stored in Excel & used in Tableau.

1 Data Manipulation Questions

Data Manipulation Query 1-4

1. How many mortgages per month were funded from 2015-11 to 2016-10 ?

MONTH	Mortgages_Per_Month
2015-11	6313
2015-12	3601
2016-01	2607
2016-02	2241
2016-03	3081
2016-04	4042
2016-05	5263
2016-06	7131
2016-07	6454
2016-08	6799
2016-09	5937
2016-10	5053




```
SELECT MONTH, COUNT(*) as Mortgages_Per_Month
FROM [SQL Mortgages]..MTG_CUST$
GROUP BY MONTH
--The data is in String format and to split the year and month separately:
SELECT MONTH, COUNT(*) as Mortgages_Per_Month,
CONCAT(SUBSTRING(CAST(MONTH as varchar), 1, 4), '-',
SUBSTRING(CAST(MONTH as varchar), 5, 2)) as MonthYear
FROM [SQL Mortgages]..MTG_CUST$
WHERE MONTH >= 201511 AND MONTH <= 201610
GROUP BY MONTH
ORDER BY MONTH ASC
-- To remove the MONTH column and replace with MonthYear column
SELECT
CONCAT(SUBSTRING(CAST(MONTH as varchar), 1, 4), '-', SUBSTRING(CAST(MONTH as varchar), 5, 2)) as MONTH,
COUNT(*) as Mortgages_Per_Month
FROM [SQL Mortgages]..MTG_CUST$
WHERE MONTH >= 201511 AND MONTH <= 201610
GROUP BY MONTH
ORDER BY MONTH ASC
```

Data Manipulation Query 1-4

2. How many mortgages are assigned to Advisor FA500_ON in 201604

Number_of_Mortgages_Assigned_to_Advisor_FA500
0

```
SELECT COUNT(*) as Number_of_Mortgages_Assigned_to_Advisor_FA500
FROM [SQL Mortgages]..MTG_CUST$
WHERE Finadvisor = 'FA500_ON' AND DATEPART(yy, MONTH) = 2016 AND DATEPART(mm, MONTH) = 4
```

3. How many new mortgages in segment “4-Accumulators[45-54]” only in 2016

Num_of_New_Mortgages
10127

```
SELECT COUNT(*) as Num_of_New_Mortgages
FROM [SQL Mortgages]..MTG_CUST$
WHERE age_segment = '4-Accumulators[45-54]'
AND MONTH >= 201601 AND MONTH <= 201612
```

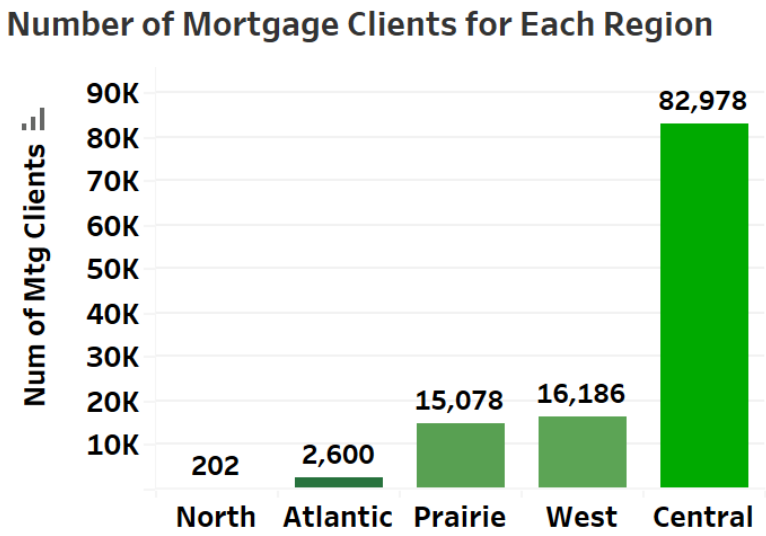
Data Manipulation Query 1-4

4. Build one or more queries to retrieve all mortgage clients grouped by region

- Number of mortgage clients for each region

Region	Num_of_Mtg_Clients
Central	82978
West	16186
Prairie	15078
Atlantic	2600
North	202

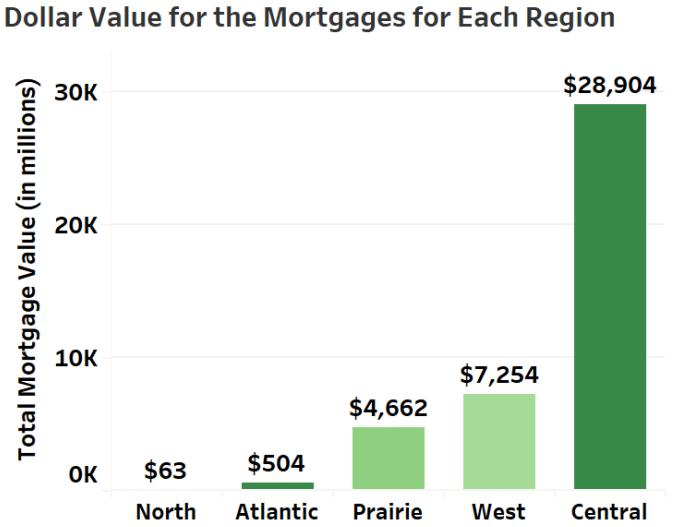
```
SELECT Region, COUNT(*) as Num_of_Mtg_Clients
FROM [SQL Mortgages]..MTG_CUST$ m
JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY Region
ORDER BY Num_of_Mtg_Clients DESC
```



- Dollar value for the mortgages for each region

Region	Total Mortgage Value (in millions)
Central	28904
West	7254
Prairie	4662
Atlantic	504
North	63

```
SELECT region, SUM(AMT_OF_LOAN) AS Total_Mortgage_Value
FROM [SQL Mortgages]..MTG_CUST$ m
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY region
--To convert into millions & remove the number after the decimals
SELECT region, CAST(ROUND(SUM(AMT_OF_LOAN)/1000000, 2)
AS INT) AS 'Total Mortgage Value (in millions)'
FROM [SQL Mortgages]..MTG_CUST$ m
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY region
ORDER BY  'Total Mortgage Value (in millions)' DESC
```



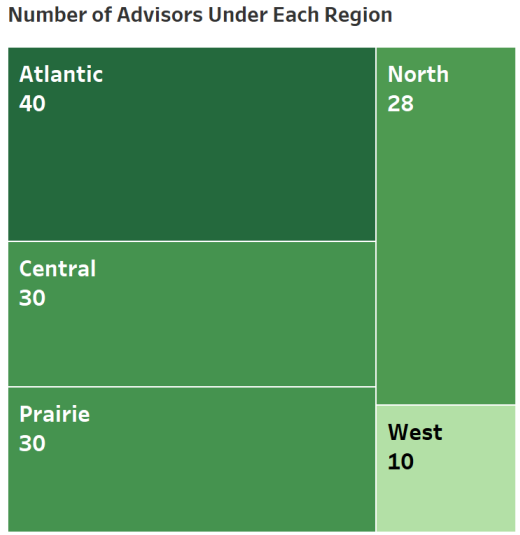
Data Manipulation Query 1-4

4. Build one or more queries to retrieve all mortgage clients grouped by region

- Number of Advisors under each region

Region	Number of Advisors
Atlantic	40
Central	30
Prairie	30
North	28
West	10

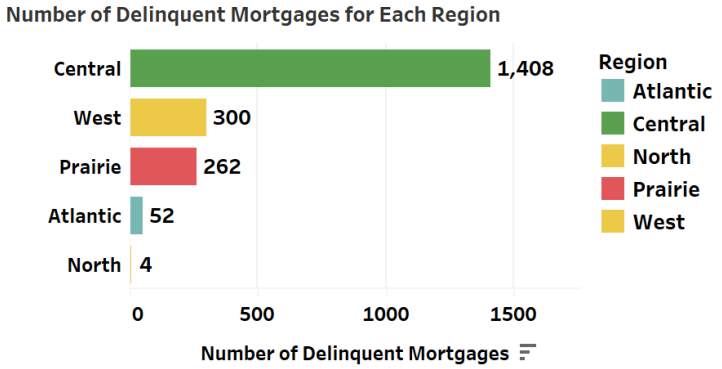
```
SELECT Region, COUNT(*) AS 'Number of Advisors'
FROM [SQL Mortgages]..FinAdvMaster$ f
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY Region
ORDER BY [Number of Advisors] DESC
```



- Number of delinquent mortgages for each region

Region	Number of Delinquent Mortgages
Central	1408
West	300
Prairie	262
Atlantic	52
North	4

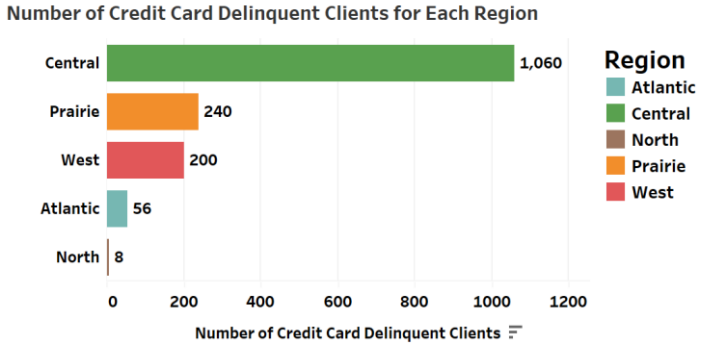
```
SELECT r.Region, COUNT(*) AS 'Number of Delinquent Mortgages'
FROM [SQL Mortgages]..MTG_DELINQ_DEC2017$ d
INNER JOIN [SQL Mortgages]..MTG_CUST$ m
ON d.CUST_Id = m.CUST_Id
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY r.Region
ORDER BY 'Number of Delinquent Mortgages' DESC
```



- Number of credit card delinquent clients for each region

Region	Number of Credit Card Delinquent Clients
North	8
Atlantic	56
Prairie	240
West	200
Central	1060

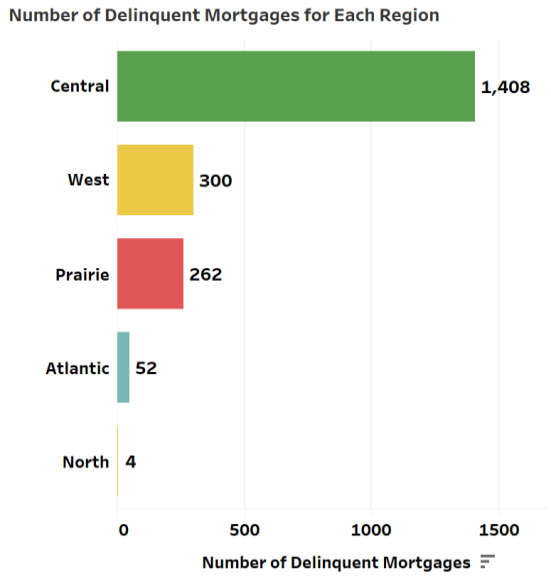
```
SELECT r.Region, COUNT(c.CUST_Id)
AS 'Number of Credit Card Delinquent Clients'
FROM [SQL Mortgages]..CC_DEL_DEC_2017$ c
INNER JOIN [SQL Mortgages]..MTG_CUST$ m
ON c.CUST_Id = m.CUST_Id
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY r.Region
```

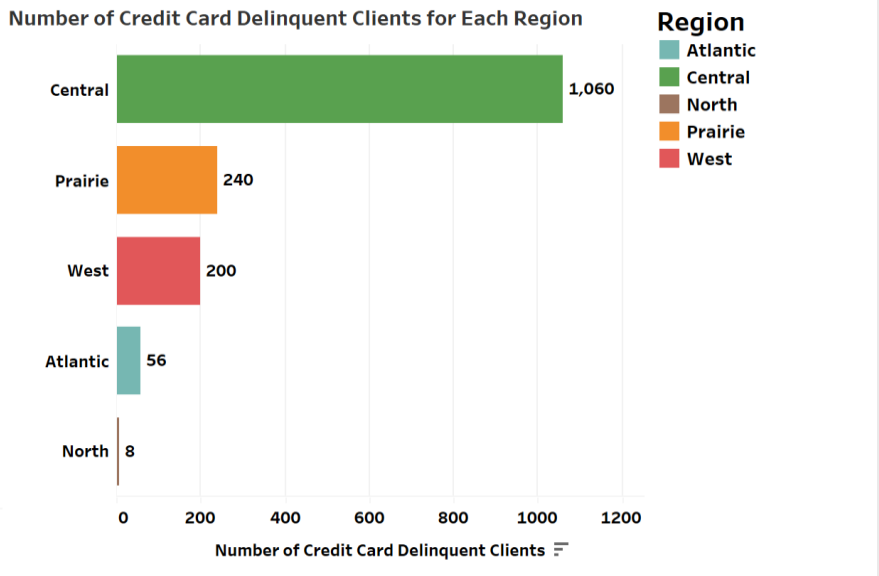


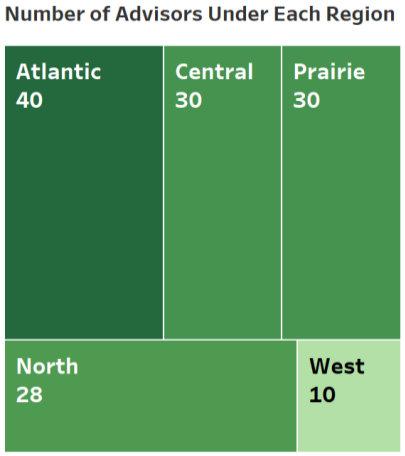
2 Business case

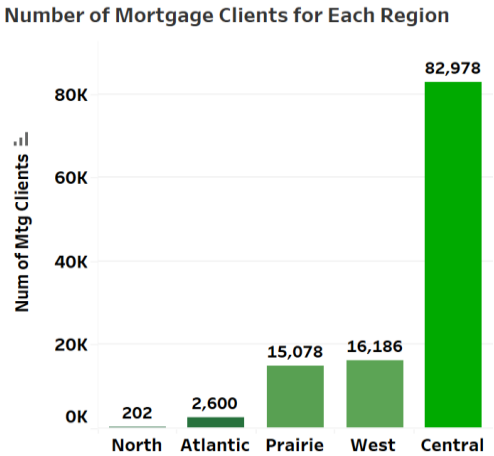
Descriptive Metrics- Analysis & Insights

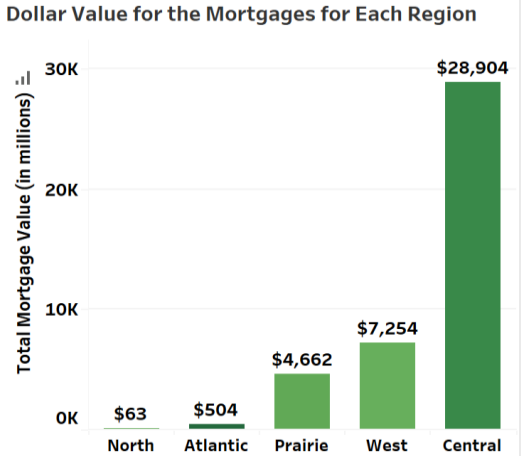
Mortgage Portfolio by Region











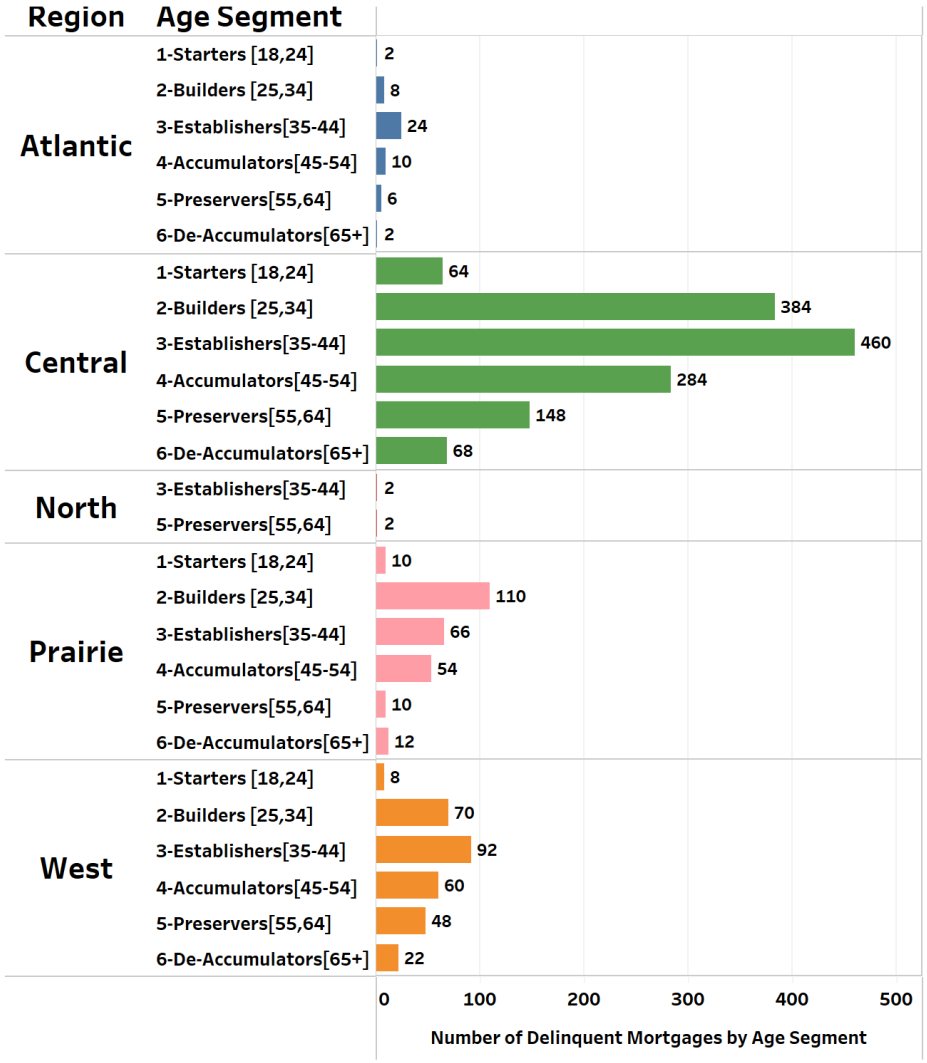
Findings

- The central region has the highest number of Mortgage clients & dollar value of mortgages while the North and Atlantic has the lowest.
- Contrary the number of advisors is low in the central region.
- Similarly, the number of delinquents for both mortgage and credit card has highest in Central.
- Number of mortgage delinquents in the West with 300 while Prairie has a higher number of credit card mortgage delinquents with 240 compared to the West with 200.

Descriptive Metrics- Analysis & Insights

Delinquent Mortgages by Client Segment (Age)

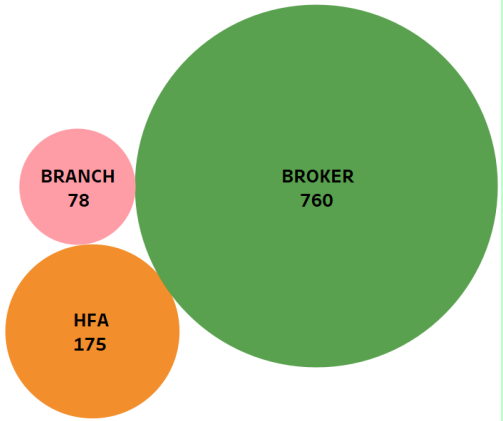
Number of Delinquent Mortgages Under Each Region by Age Segment



All Regions Number of Delinquent Mortgages by Age Segment

Age Segment	
3-Establishers[35-44]	322
2-Builders [25,34]	286
4-Accumulators[45-54]	204
5-Preservers[55,64]	107
6-De-Accumulators[65+]	52
1-Starters [18,24]	42

Number of Delinquent's Mortgage by Source

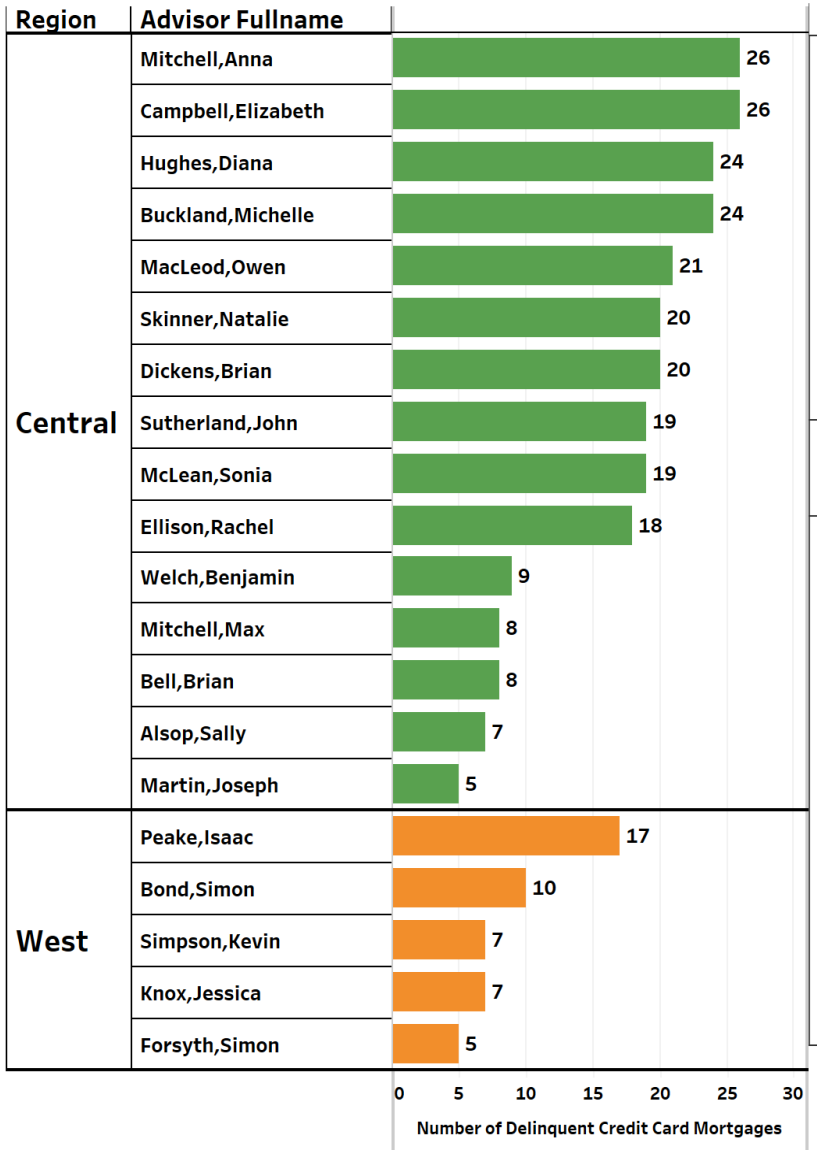


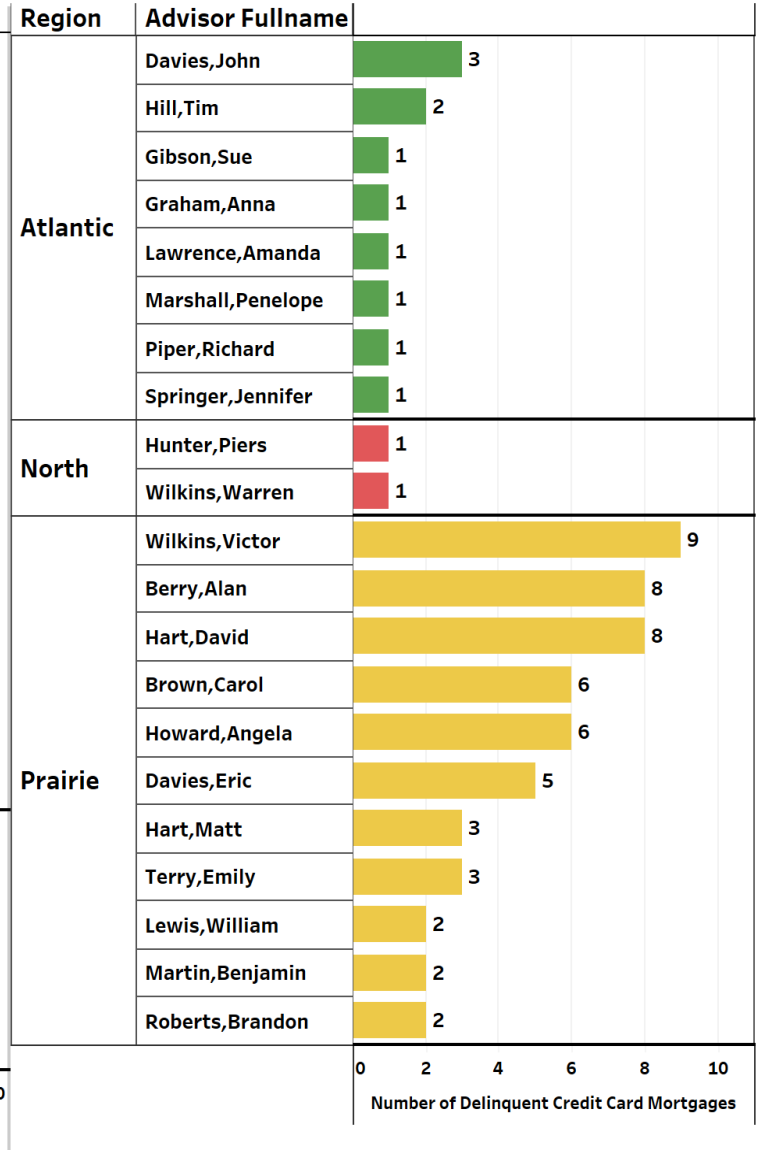
Findings

- At the national level, clients with age 35-44 have the highest number of mortgages delinquent followed by those aged 25-34.
- Age 65+ and 18-24 have the lowest number.
- The central region has the highest number of mortgage delinquents while the North and Atlantic have the lowest.
- Broker has the highest number of mortgage delinquents followed by HFA.

Descriptive Metrics- Analysis & Insights

Credit Card Delinquent Mortgages With Respect to Advisors



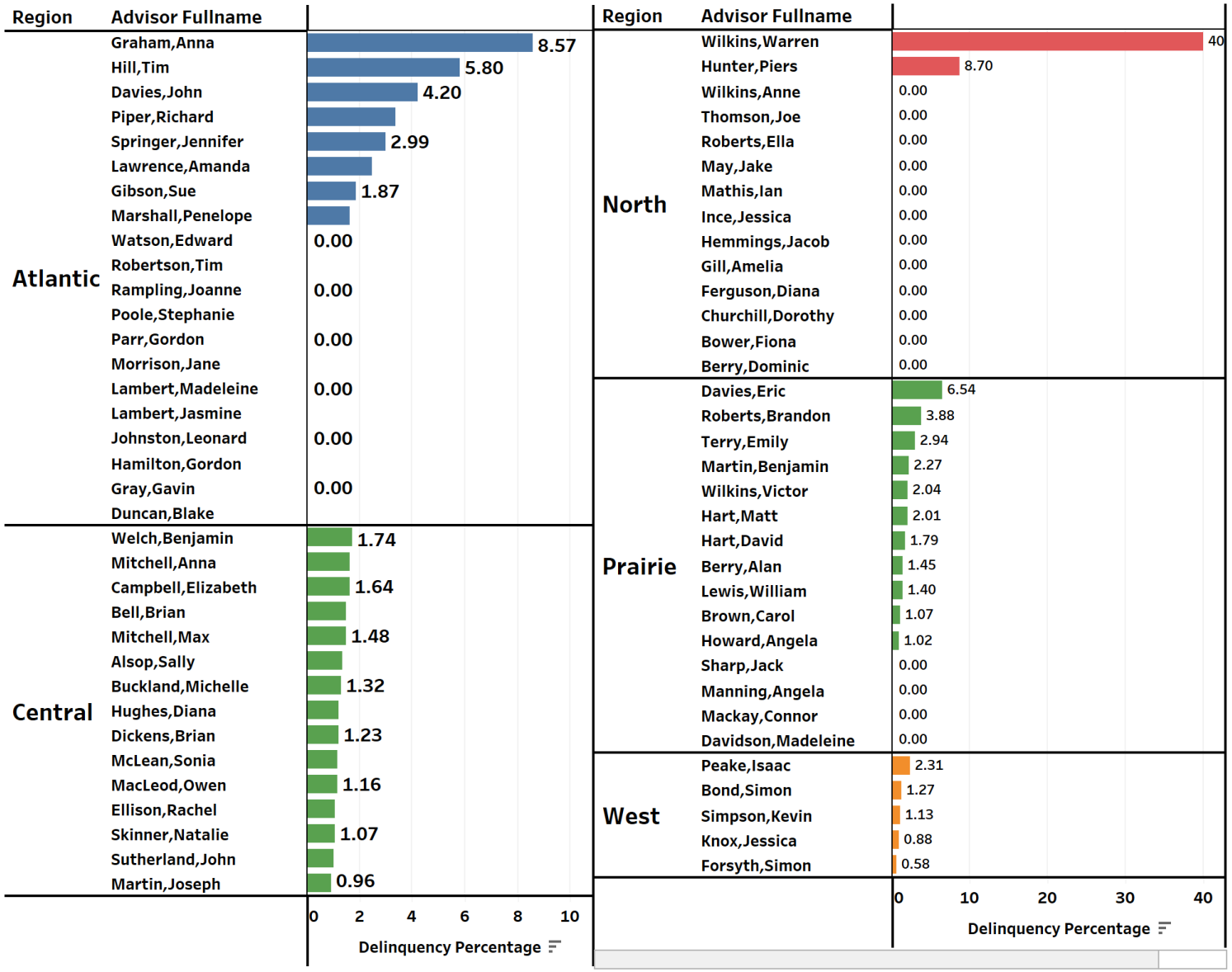


Findings

- Under the central region, the advisor Anna and Elizabeth has the highest number of CC mortgage delinquencies while Sally and Joseph have the lowest.
- Similarly, Issac and Simon have high in the West.
- Victor has the highest in the Prairie region.

Descriptive Metrics- Analysis & Insights

% of Credit Card Mortgage Delinquent b/w Number of Clients & Delinquent w.r.t Region

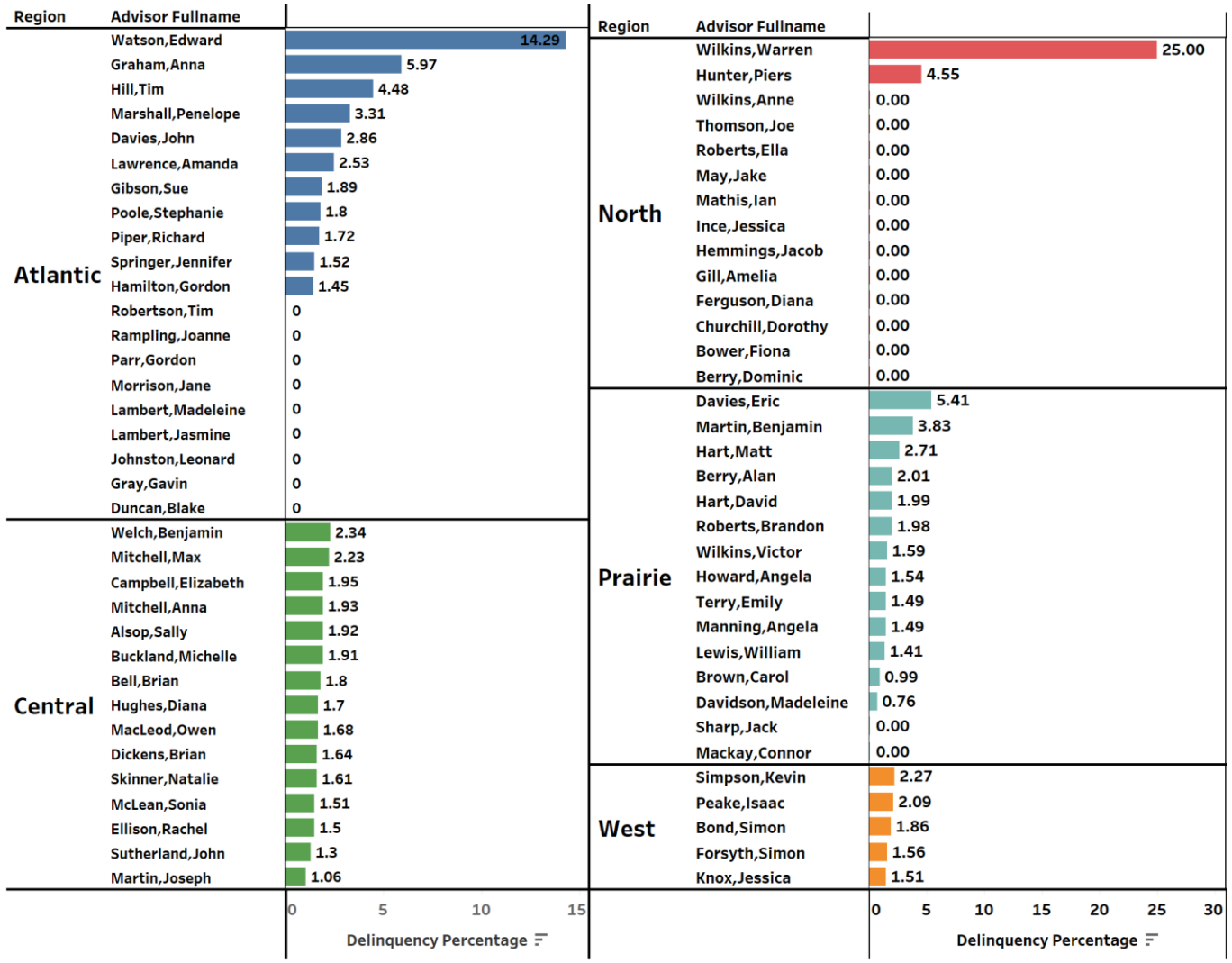


Findings

- **No of Delinquent / No of Client/*100**
- Warren from the North region has the highest % of delinquent mortgages (10/4).
- Anna has the highest with 8.57% from the Atlantic region.
- Compared to other regions, Central region advisors have a lower of delinquent %.

Descriptive Metrics- Analysis & Insights

% of Mortgage Delinquent Between Number of Clients & Delinquent w.r.t Region & Advisors



Findings

- Under the Atlantic, the Edward has the highest number of delinquents while there are 9 advisors with zero
- Eric has the highest % of mortgage delinquency from the Prairie region while Jack & Connor with zero.

Recommendations (Regional)

- Focus on improving the performance of the advisors within their region to reduce delinquency & increasing the total value.
- Also consider providing additional training or support to the advisors to help them improve their performance(higher delinquency rate advisors).
- To identify and target specific client segments within their region that may be at higher risk of delinquency.
- Regional managers in the central region have to hire more advisors to reduce delinquencies and give better customer service.

Recommendations (National)

- Implement a system for tracking and monitoring the performance & workload of advisors across the country.
- Consider implementing additional risk management strategies to help reduce the overall number of delinquent mortgages.
- There is a huge correlation between the number of mortgages funded and delinquencies in certain months.
- To develop a system to find out the number of clients with respect to the workload of advisors in each region.

References

https://www.w3schools.com/sql/

https://stackoverflow.com/

SQL Data camp

Data Analyst Portfolio Project | Tableau Visualization from YouTube by Alex

Business Case Queries

Delinquent Mortgages by Client Segment (Age)

- **To find the number of delinquent mortgages under each region by age_segment**

```
SELECT r.Region, m.age_segment, COUNT(d.CUST_ID) AS 'Number of Delinquent
Mortgages'
FROM [SQL Mortgages]..MTG_DELINQ_DEC2017$ d
INNER JOIN [SQL Mortgages]..MTG_CUST$ m
ON d.CUST_ID = m.CUST_ID
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY r.Region, m.age_segment
```

--Number of Credit Card Delinquent Mortgages by Age Segment

```
SELECT age_segment, COUNT(*) AS 'Number of Delinquent Mortgages'
FROM [SQL Mortgages]..CC_DEL_DEC_2017$ d
INNER JOIN [SQL Mortgages]..MTG_CUST$ c
ON d.CUST_Id = c.CUST_ID
GROUP BY age_segment
ORDER BY 'Number of Delinquent Mortgages' DESC
```

--To find the number of delinquent mortgage by Source

```
SELECT Source, Count(*) as 'Number of Delinquent Mortgages by Source'
FROM [SQL Mortgages]..MTG_CUST$ m
INNER JOIN [SQL Mortgages]..MTG_DELINQ_DEC2017$ d
ON m.CUST_ID = d.CUST_ID
GROUP BY Source
```

Business Case Queries

Delinquent Mortgages With Respect to Advisors

```
--To find the number of delinquent credit card mortgages in each region by the advisor and also the balance amount
--Advisors delinquent portfolio ($ and number of mortgages)

SELECT r.Region, f.AdvisorFullname, COUNT(c.CUST_ID) AS 'Number of Delinquent Credit Card Mortgages', SUM(c.balance) AS 'Total Balance'
FROM [SQL Mortgages]..CC_DEL_DEC_2017$ c
INNER JOIN [SQL Mortgages]..MTG_CUST$ m
ON c.CUST_ID = m.CUST_ID
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY r.Region, f.AdvisorFullname
ORDER BY r.Region
```

Business Case Queries

% of Credit Card Mortgage Delinquent Between Number of Clients & Delinquent w.r.t Advisors

```
SELECT r.Region, f.AdvisorFullname, COUNT(m.CUST_ID) AS 'Total Number of Clients',
COUNT(d.CUST_ID) AS 'Number of Credit Card Delinquent Mortgages',
ROUND((COUNT(d.CUST_ID) * 100.0) / COUNT(m.CUST_ID), 2) AS 'Delinquency
Percentage'
FROM [SQL Mortgages]..MTG_CUST$ m
LEFT JOIN [SQL Mortgages]..CC_DEL_DEC_2017$ d
ON m.CUST_ID = d.CUST_ID
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY r.Region, f.AdvisorFullname
ORDER BY r.Region, f.AdvisorFullname
```

Business Case Queries

% of Mortgage Delinquent Between Number of Clients & Delinquent w.r.t Region & Advisors

```
SELECT r.Region, f.AdvisorFullname, COUNT(m.CUST_ID) AS 'Total Number of Clients',
COUNT(d.CUST_ID) AS 'Number of Delinquent Mortgages',
ROUND((COUNT(d.CUST_ID) * 100.0) / COUNT(m.CUST_ID), 2) AS 'Delinquency Percentage'
FROM [SQL Mortgages]..MTG_CUST$ m
LEFT JOIN [SQL Mortgages]..MTG_DELINQ_DEC2017$ d
ON m.CUST_ID = d.CUST_ID
INNER JOIN [SQL Mortgages]..FinAdvMaster$ f
ON m.Finadvisor = f.FinAdvID
INNER JOIN [SQL Mortgages]..Region$ r
ON f.Province = r.Province
GROUP BY r.Region, f.AdvisorFullname
ORDER BY r.Region, f.AdvisorFullname
```