**Introduction**

The purpose of this presentation is to analyze and visualize crime data for the provinces of Ontario, Quebec, and British Columbia (BC) in order to provide insights and recommendations. Our focus will be on a specific type of crime (Fraud), and we will delve into various aspects related to the crime rates, correlations, and future projections for these provinces.

These visualizations will enable us to compare crime rates between the provinces over the past 10 years, identify the top three cities with the highest crime rates in each province, examine the correlation between youth crime and adult crime in these high crime-rate cities, and determine the projected crime rates for the upcoming year in Ontario, Quebec, and British Columbia.

By utilizing the provided incident-based crime statistics data from Statistics Canada, we aim to uncover meaningful insights that will aid in understanding the crime trends and patterns within these provinces. These insights will ultimately assist in devising strategies to better support and collaborate with local police forces across Ontario, Quebec, and British Columbia.

**Justification for the Visualization Tool**

Microsoft Power BI is an ideal tool for analyzing and presenting complex data sets like crime statistics. It offers a range of powerful features that enable us to import, transform, and visualize data in a user-friendly and visually appealing manner. The interactive nature of Power BI allows us to explore the data from various angles and gain valuable insights quickly.

With Power BI, we can create dynamic and interactive visualizations such as charts, graphs, and maps, which effectively convey information and facilitate data-driven decision-making. Additionally, Power BI allows us to combine multiple data sources, perform data transformations, and apply advanced analytics techniques to gain deeper insights.

Given the complexity and scope of the crime data we are working with, Power BI's capabilities are essential in transforming raw data into meaningful visual representations that can easily be understood and used to inform his decision-making process.

**Explanation of data analysis/visualization approach:**

To conduct the data analysis and create the visualizations, we will follow a systematic approach using Microsoft Power BI. The steps involved in our analysis and visualization process are as follows:

1. **Data Import**: We will begin by importing the incident-based crime statistics data for Ontario, Quebec, and British Columbia from the provided CSV datasets. Using Power Query, we transform and load the data to ensure it is in a suitable format for analysis.

2. **Data Exploration**: After importing the data, we will explore its structure and contents. This step involves understanding the available variables, identifying key attributes related to crime rates, gaining insights into the data's overall quality and completeness, removing columns that would not be useful for our visuals, creating new columns, creating new measures, Using the union syntax to create a new table joining all the three different CSV file from different provinces into one, using DAX formula to create new columns to help with good insights.

3. **Crime Rate Comparison**: Our first objective is to compare the crime rates between Ontario, Quebec, and British Columbia over the last 10 years. To achieve this, we will create stacked area charts that visualize the trend in crime rates for each province over time. This will allow us to observe any patterns or significant changes in crime rates.

4. **Top 3 Cities Comparison:** Next, we will compare the crime rates for the top three cities in each province that have the highest crime rates. We created table charts to display the Geo, and the sum of actual incidents, province, and the total crime rank for these cities side by side, enabling us to compare and identify any variations in crime rates among the selected cities.

5. **Correlation Analysis**: To determine if there is a correlation between youth crime and adult crime in cities, we will employ scatter plots with a trend line with a calculated measure correlation rate. These visualizations will help us examine the relationship between the number of youth crimes and adult crimes in each city. By analyzing the scatter plot, we can assess if there is any correlation between these three variables.

6. **Crime Rate Projection:** Lastly, we will use historical data to project the crime rates for the upcoming year in Ontario, Quebec, and British Columbia. We will employ forecasting techniques available in Power BI, such as exponential smoothing or ARIMA models, to generate predictions. These projected crime rates will be presented through line charts, providing us with insights into potential future trends. This will help him make a more informed decision.

**Report findings**

**Stacked column chart showing the Crime rate for British Columbia for over 10 years.**

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**Stacked column chart showing the Crime rate for Ontario for over 10 years.**

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**Stacked column chart showing the Crime rate for Quebec for over 10 years.**

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The charts above show the crime rates in Ontario, Quebec, and British Columbia in the last 10 years from the visuals above. We can see that the city with the highest crime rate (fraud) is Ontario with **54,314.00** and this was in the year **2019**. this could be a result of the fact that it is one of the largest cities in Canada with over 2,600,00 populations compared to others and it is more developed compared to Quebec and British Columbia. The city with the second-largest crime rate (fraud) is British Columbia in **201**9 with **20,284.00** which is also high but not as high as ON(Ontario). The city with the least crime rate among the three cities compared is Quebec and they had the highest crime rate in **2021** with **15,781.00.** This could be due to numerous reasons like Legislative and policy differences and Socioeconomic factors.

**Recommendation**

1. Allocate more resources for crime prevention programs in Ontario.

2. Increase law enforcement presence and collaboration in Ontario.

3. Enhance fraud detection and investigation capabilities in Ontario.

4. Analyze factors behind Quebec's crime rate increase and learn from successful strategies.

5. Address socioeconomic factors contributing to crime in all regions.

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The table above displays the top 3 cities in each province with the highest crime rate (fraud) a slicer was added to the chart to show the date range for the crime rank In each city.

The total number of crimes in all the cities is **309,392.00**. From the visual insight we can denote from it Is the fact that Toronto**,** **Ontario** has the highest crime rate with **100,049.00** and it also ranked **number one**, coming second place with a high number of crime Montreal Quebec with **52,506.0**0 also in number one ranking then we have in the same rank surrey in British Columbia.

For the second rank, we have Ottawa, Ontario with the highest number (35,730.00) then Vancouver, British Columbia is the second highest number (24,066.00) then Quebec with (15,365.00).

In the third ranking, we have York region, Ontario has the highest number (33,626) then Quebec with (10,166.00) followed by Burnaby, British Columbia with (7,512).

One very important piece of information that can be derived from this information and will be of good use to Officer Ricard is that Ontario has the highest crime rate amongst every other province.

**Recommendation**

Stringent rules should be carried out and increased law enforcement efforts should be implemented to address the high crime rate in Ontario.

The data suggests that fraud is a prevalent issue across multiple provinces, with Toronto, Montreal, and Surrey being the top three cities with the highest crime rates. We Should focus on enhancing fraud prevention measures, increasing public awareness campaigns, and working closely with financial institutions and community organizations to educate citizens about fraud prevention and reporting mechanisms.

**Correlation for BC crime rate for Youth and Adult**

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**Correlation for ON (Ontario) crime rate for Youth and Adult**

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**Correlation for QC(Quebec) crime rate for Youth and Adult**

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The data presented in the charts provide insights into the correlation between high crime rates of fraud among youth and adults in three provinces: Ontario (ON), British Columbia (BC), and Quebec (QC).

We have **ON** with a correlation coefficient of **0.18** which means the relationship between the high crime rate city and the province between youth and adults in **ON** is weakly positive. This means that there is a slight tendency for the high crime rate in the city to be associated with a higher crime rate in the province.

We also have a correlation coefficient for **BC** with **0.13** that infers that the positive correlation implies that as the high crime rate of fraud in the city increases, there is a slight tendency for the province of **BC** to also experience a higher crime rate of fraud. However, the strength of this relationship is considered between youth and adult is weak, indicating that other factors may have had a more significant influence on the crime rate of fraud in **BC.**

Lastly, in **Quebec (QC**), the correlation coefficient of **0.14** signifies a weak positive correlation between the high crime rate of fraud in the city and the province among youth and adults. This suggests a slight tendency for the city's high crime rate to be slightly higher when considering the province. However, it's important to recognize that the relationship between the two variables is not particularly strong.

In summary, the analysis reveals that while there is some degree of correlation between the high crime rates of fraud in cities and their respective provinces, these relationships are weak. This indicates that factors other than the youth and adult crime rates may have a more substantial influence on the overall crime rate of fraud in each province.

With the analysis above the we will be able to make Targeted interventions due to the understanding the weak positive correlation between city and provincial crime rates.

**Forecast For British Columbia**

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**Forecast for Quebec**

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**Forecast for Ontario**

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The chart above shows the forecasted crime rate for next year (2022) for each of the provinces.

For British Columbia, we have an expected number of (**40,904.25**) which is more than the current year’s (**40,696.00**). this simply shows an expected increase in the number of fraud cases in British Columbia.

However, for Quebec, we have an expected number in the crime rate of (**52,236.47**) which is a large number compared to the current year (**47,636.00)** which means there will be an increase of **9.652%.** it suggests that there is an upward trend in the crime rate.

In Ontario, we have a forecasted/expected crime rate to be **103, 061.47** for the next year while in the current year, the crime rate is **102,858.00**. Which means there will be an increase of **0.1977%.** which is relatively minimal. This suggests that the overall crime rate is expected to remain relatively stable or experience a very slight increase.

**Recommendations**

1. British Columbia: Monitor and investigate fraud cases diligently and collaborate with local agencies and financial institutions for fraud prevention measures.

2. Quebec: Prioritize resource allocation, focus on areas with the highest surge in criminal activities, engage community leaders, and promote neighborhood watch programs.

3. Ontario: Maintain law enforcement efforts, emphasize community policing, collaborate with other agencies, and allocate resources to crime prevention initiatives and public education campaigns.

**Conclusion:**

This report has provided a comprehensive analysis of crime rates in Ontario, Quebec, and British Columbia, focusing on a specific crime. The visualizations and insights presented aim to enhance our understanding of crime trends, support collaboration between police services, and aid in resource allocation. By leveraging the capabilities of Microsoft Power BI, we have created meaningful visual representations of the data, facilitating informed decision-making.