**Crime V/s Immigration Trend Analysis**

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**INFO8076: SQL and Data Analysis**

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**Goal of the project – What do you want to learn from this data?**

The primary purpose of this project is to investigate how immigration numbers interact with crime rates in five major regions in Ontario between 2022 and 2023. We want to uncover trends and patterns of criminal activity, as well as to investigate the types of violations that are most common in various cities. Furthermore, we use a structured query language (SQL) for data extraction and analysis to assess whether certain cities have higher crime rates as a result of the greater effect of immigrants and other factors. The goal is to give data-driven insights that will lead to improved planning, policy decisions, and public safety measures in Ontario's communities.

**Data Source and Data Cleaning Process**

**Data Source:**

Crime Data- <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3510018001&pickMembers%5B0%5D=1.8&pickMembers%5B1%5D=2.5&cubeTimeFrame.startYear=2022&cubeTimeFrame.endYear=2023&referencePeriods=20220101%2C20230101>

Immigration Data- <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710012101&pickMembers%5B0%5D=1.7&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2022&cubeTimeFrame.endMonth=10&cubeTimeFrame.endYear=2023&referencePeriods=20220101%2C20231001>

**Data Cleaning Process:**

Statistics Canada provided data for the project in two main datasets: Crime Data, which contains information about criminal acts and violations, and Immigration Data, which displays immigrant population patterns in Ontario from across the world. The data cleaning process included various steps. The ensure accuracy of data, the missing values were eliminated. Then the special characters were removed for the SQL to accept the data. The data types were converted to uniform patterns to have a smooth upload of the data process. Then the dataset was divided into multiple tables according to the specifications to create linkage among them. Then the column names were standardized according to the need to have a consistent format for uniformity. The tables were created in such a way that the linkage was sequential and could provide ease while performing queries. The data cleaning was completed in a precise manner to have uniformity throughout the dataset.

**Relational schema/ERD**

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The ERD describes the relational schema used to efficiently link diverse datasets. The YEAR\_TABLE is the parent table, whereas the other tables in the ERD are child tables: CRIME\_DATA, IMMIGRATION, STATISTICS, VIOLATIONS, and CRIME\_SCENE. Each table serves a specific purpose in data, and the linkages between them are established by identifiers.

* YEAR\_TABLE: This table plays a crucial role in connecting the Crime data and the Immigration data by acting as a parent table.
* CRIME\_DATA: This table stores detailed information about crime incidents across different cities. It includes data such as the type of crime, the year it occurred, city where it was reported. The table is linked to immigration data via YEAR(PK) and other tables via UNI\_ID as it’s a global identifier for each crime record. This crime data correlated with other data like immigration, violation, and statistic types.
* IMMIGRATION: This table contains information about the number of immigrants arriving in Ontario over time and that further breaks down into the year they arrived and the resident type. This table is connected to the CRIME\_DATA table through the YEAR(PK) by linking the immigration data with crime data.
* VIOLATIONS: This table provides details about the different types of violations that occurred in the 5 cities, namely traffic violations, homicides, murder, and immigration acts. Each violation type is linked to the CRIME\_DATA table through a unique identifier as CRIME\_ID(FK).
* STATISTICS: This table has a summary of the statistics for each violation. The STATISTICS table is linked to the CRIME\_DATA via CRIME\_ID(FK) which ensures the data corresponds accurately to individual crime records.
* CRIME\_SCENE: This table provides the data about the location of crime, basically the cities in which the crime has occurred. The table is linked to CRIME\_DATA through CRIME\_ID(FK) ensuring the location details correspond to the crime records.

**SQL Queries**

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| **Query 1:** Crimes by Violation Type and City (Top Violations View)  CREATE VIEW top\_violations\_by\_city AS  SELECT  cs.CITY,  v.VIOLATIONS,  SUM(cd.VALUE) AS Total\_Crimes  FROM CRIME\_DATA cd  INNER JOIN VIOLATIONS v ON cd.VIO\_UNI\_ID = v.VIO\_UNI\_ID  INNER JOIN CRIME\_SCENE cs ON cd.C\_GUID = cs.C\_GUID  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE s.STATISTICS = 'Actual incidents'  GROUP BY cs.CITY, v.VIOLATIONS  HAVING SUM(cd.VALUE) > 0  ORDER BY cs.CITY, Total\_Crimes DESC;  SELECT \* FROM top\_violations\_by\_city; |
| **Output**   |  |  |  | | --- | --- | --- | | **City** | **violations** | **total\_crimes** | | Chatham Kent | Total Criminal Code traffic violations | 48000 | | Chatham Kent | Homicide | 720 | | Chatham Kent | Murder, first degree | 240 | | Ottawa | Total Criminal Code traffic violations | 259072 | | Ottawa | Homicide | 4096 | | Ottawa | Total Immigration and Refugee Protection Act | 1920 | | Ottawa | Murder, first degree | 1664 | | Peel Region Mississauga | Total Criminal Code traffic violations | 525168 | | Peel Region Mississauga | Homicide | 6678 | | Peel Region Mississauga | Murder, first degree | 4158 | | Peel Region Mississauga | Total Immigration and Refugee Protection Act | 378 | | Toronto | Total Criminal Code traffic violations | 538880 | | Toronto | Total Immigration and Refugee Protection Act | 19968 | | Toronto | Homicide | 18560 | | Toronto | Murder, first degree | 7424 | | Waterloo Region Kitchener | Total Criminal Code traffic violations | 231486 | | Waterloo Region Kitchener | Homicide | 1476 | | Waterloo Region Kitchener | Murder, first degree | 615 | | Waterloo Region Kitchener | Total Immigration and Refugee Protection Act | 246 | |

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| **Insight**  All cities demonstrate traffic violations as their most common crime reports while Toronto holds the highest number of traffic violations totaling 538,880 incidents. The homicide rates in Toronto exceed those of Peel Region Mississauga by a large margin (18,560 compared to 6,678). Toronto serves as an immigration hub because it experiences the largest number of immigration violations (19,968). Cities need to focus their crime prevention strategies on specific urban regions based on these observation patterns. |

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| **Query 2:** Crime Volume Contribution by City (as % of Total)  WITH city\_totals AS (  SELECT  cs.CITY,  SUM(cd.VALUE) AS city\_total  FROM CRIME\_DATA cd  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  INNER JOIN CRIME\_SCENE cs ON cd.C\_GUID = cs.C\_GUID  WHERE s.STATISTICS = 'Actual incidents'  GROUP BY cs.CITY  ),  overall\_total AS (  SELECT SUM(city\_total) AS total\_crimes FROM city\_totals  )  SELECT  ct.CITY,  ct.city\_total,  ROUND((ct.city\_total::NUMERIC / ot.total\_crimes) \* 100, 2) AS percent\_contribution  FROM city\_totals ct  CROSS JOIN overall\_total ot  ORDER BY percent\_contribution DESC; |
| **Output**   |  |  |  | | --- | --- | --- | | **city** | **city\_total** | **percent\_contribution** | | Toronto | 584832 | 35 | | Peel Region Mississauga | 536382 | 32.1 | | Ottawa | 266752 | 15.97 | | Waterloo Region Kitchener | 233823 | 14 | | Chatham Kent | 48960 | 2.93 | |
| **Insight**  The statistical breakout shows Toronto together with Mississauga in Peel Region generates 67% of actual crimes that prove these areas have the highest criminal activity in Ontario. Toronto accounts for 35%, followed by Peel (32.1%). Chatham Kent, on the other hand, provides less than 3%, highlighting a significant geographical gap and the necessity for targeted urban crime prevention initiatives. |

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| **Query 3:** Total 'Actual incidents' per Year for 5 cities  SELECT  cd.CRIME\_YEAR,  SUM(cd.VALUE) AS Total\_Actual\_Crimes  FROM CRIME\_DATA cd  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE s.STATISTICS = 'Actual incidents'  GROUP BY cd.CRIME\_YEAR  ORDER BY cd.CRIME\_YEAR; |
| **Output**   |  |  | | --- | --- | | **crime\_year** | **total\_actual\_crimes** | | 2022 | 6415 | | 2023 | 6804 | |
| **Insight**  The output indicates year over year comparison of total Actual Incidents reported by cities in Ontario for years 2022 and 2023. According to the results 6415 actual crime incidents reported in 2022 and which increased to 6804 incidents in 2023. This reflects an increase of 389 incidents, indicating 6.1% rise in crime incidents. |

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| **Query 4:** Total Immigration Count per Year for Ontario  SELECT  IMM\_YEAR,  SUM(VALUE) AS Total\_Immigrants  FROM IMMIGRATION  GROUP BY IMM\_YEAR  ORDER BY IMM\_YEAR; |
| **Output**   |  |  | | --- | --- | | **imm\_year** | **total\_immigrants** | | 2022 | 8366544 | | 2023 | 12157155 | |
| **Insight**  The output indicates the clear insight of immigration trends in Ontario for the years, 2022 and 2023. There is significant increase in number of immigrants from 2022 having 8.37 million to 12.16 million in 2023. This represents a substantial increase of over 3.8 million immigrants and the growth rate of approximately 45% over year. |

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| **Query 5:** Most Frequent Violation Yearwise  SELECT  cd.CRIME\_YEAR,  v.VIOLATIONS,  COUNT(\*) AS Violation\_Count  FROM CRIME\_DATA cd  INNER JOIN VIOLATIONS v ON cd.VIO\_UNI\_ID = v.VIO\_UNI\_ID  GROUP BY cd.CRIME\_YEAR, v.VIOLATIONS  ORDER BY cd.CRIME\_YEAR, Violation\_Count DESC; |
| **Output**   |  |  |  | | --- | --- | --- | | **crime\_year** | **Violations** | **violation\_count** | | 2022 | Total Criminal Code traffic violations | 80 | | 2022 | Homicide | 78 | | 2022 | Murder, first degree | 78 | | 2022 | Total Immigration and Refugee Protection Act | 76 | | 2023 | Total Criminal Code traffic violations | 80 | | 2023 | Homicide | 79 | | 2023 | Murder, first degree | 78 | | 2023 | Total Immigration and Refugee Protection Act | 76 | |
| **Insight**  Total Criminal Code traffic violations maintained their position as the most common violation for 2022 and 2023 with 80 incidents reported yearly. Both Homicide and first-degree murder stayed consistently close to each other with little yearly change which indicates persistent violent crime rates. The Total Immigration and Refugee Protection Act violations maintained the same yearly case numbers at 76 annually. The steady crime patterns in these particular categories point either to ongoing enforcement difficulty or consistent trends of similar crimes throughout Ontario. |

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| **Query 6:** Cities with Highest Crime in 2023  SELECT  cs.CITY,  SUM(cd.VALUE) AS Total\_Crime\_2023  FROM CRIME\_DATA cd  INNER JOIN CRIME\_SCENE cs ON cd.C\_GUID = cs.C\_GUID  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE cd.CRIME\_YEAR = 2023 AND s.STATISTICS = 'Actual incidents'  GROUP BY cs.CITY  ORDER BY Total\_Crime\_2023 DESC; |
| **Output**   |  |  | | --- | --- | | **City** | **total\_crime\_2023** | | Toronto | 299776 | | Peel Region Mississauga | 279468 | | Ottawa | 135168 | | Waterloo Region Kitchener | 118572 | | Chatham Kent | 26880 | |
| **Insight**  Toronto achieved the status of highest crime incidents in actual reports throughout Ontario during 2023 with 299,776 cases while Peel Region Mississauga trailed closely behind with 279,468 incidents. The actual crime incident rates for the mid-sized cities of Ottawa totaled 135,168 while Waterloo Region accumulated 118,572 incidents of crime. Actual crime incidents registered the most in Chatham Kent with only 26,880 cases. The way crimes are geographically spread across cities indicates extensive criminal activity in densely populated urban spaces requiring preventive measures directed at these areas. |

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| **Query 7:** Unfounded Crime Reports per City  SELECT  cs.CITY,  COUNT(\*) AS Unfounded\_Reports  FROM CRIME\_DATA cd  INNER JOIN CRIME\_SCENE cs ON cd.C\_GUID = cs.C\_GUID  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE s.STATISTICS = 'Unfounded incidents'  GROUP BY cs.CITY; |
| **Output**   |  |  | | --- | --- | | **city** | **unfounded\_reports** | | Ottawa | 1024 | | Chatham Kent | 960 | | Waterloo Region Kitchener | 984 | | Toronto | 1024 | | Peel Region Mississauga | 1008 | |
| **Insight**  The number of unfounded crimes reports among Ontario municipalities remains similar since they fluctuate between 960 and 1,024 incidents. 1,024 incidents of unfounded crime happened in Toronto and Ottawa while Chatham Kent reported only 960 cases. Standardized reporting procedures or possible operational issues during crime legitimacy verification seem to explain the low differences in reports across different cities. |

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| **Query 8:** Categorize Cities by Crime Volume using CASE  SELECT  cs.CITY,  cd.CRIME\_YEAR,  SUM(cd.VALUE) AS Total\_Crimes,  CASE  WHEN SUM(cd.VALUE) >= 150000 THEN 'High'  WHEN SUM(cd.VALUE) BETWEEN 100000 AND 149999 THEN 'Medium'  ELSE 'Low'  END AS Crime\_Level  FROM CRIME\_DATA cd  INNER JOIN CRIME\_SCENE cs ON cd.C\_GUID = cs.C\_GUID  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE s.STATISTICS = 'Actual incidents'  GROUP BY cs.CITY, cd.CRIME\_YEAR  ORDER BY Total\_Crimes DESC; |
| **Output**   |  |  |  |  | | --- | --- | --- | --- | | **city** | **crime\_year** | **total\_crimes** | **crime\_level** | | Toronto | 2023 | 299776 | High | | Toronto | 2022 | 285056 | High | | Peel Region Mississauga | 2023 | 279468 | High | | Peel Region Mississauga | 2022 | 256914 | High | | Ottawa | 2023 | 135168 | Medium | | Ottawa | 2022 | 131584 | Medium | | Waterloo Region Kitchener | 2023 | 118572 | Medium | | Waterloo Region Kitchener | 2022 | 115251 | Medium | | Chatham Kent | 2023 | 26880 | Low | | Chatham Kent | 2022 | 22080 | Low | |
| **Insight**  The output categorizes the 5 cities based on the volume of actual crime incidents reported in the year 2022 and 2023 with crime level as High, Medium, and Low. The total number of crimes in cities with 150000 or more incidents as high level between 100000 to 149999 as medium and below 100000 as low level.  Toronto and Mississauga are consistently categorized as High crime level cities with reporting the highest number of incidents in both years with approximately 300000 in 2023. Ottawa and Waterloo Region Kitchener fall into medium crime level with total ranging between 115,000 to 135,000 in two years. Chatham Kent is listed in the low crime level category with crime incidents below 30,000 annually. |

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| **Query 9:** Number of Distinct Violation Types per Year  SELECT  CRIME\_YEAR,  COUNT(DISTINCT VIO\_UNI\_ID) AS Violation\_Count  FROM CRIME\_DATA  GROUP BY CRIME\_YEAR; |
| **Output**   |  |  | | --- | --- | | **crime\_year** | **violation\_count** | | 2022 | 312 | | 2023 | 313 | |
| **Insight**  The overall number of violation categories that law enforcement identified showed no significant change between 2022 and 2023 because the number of unique types stayed at 312 before increasing to 313. Offense classification remained steady from one year to the next leading to this limited numerical change. The modest increase in distinct violation types indicates both new types of criminal offenses and changes in recording methods used by law enforcement and legal definition adjustments. |

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| **Query 10:** View: Yearly Crime and Immigration Summary  CREATE VIEW yearly\_crime\_immigration\_summary AS  SELECT  y.YEAR,  (SELECT SUM(cd.VALUE)  FROM CRIME\_DATA cd  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE cd.CRIME\_YEAR = y.YEAR AND s.STATISTICS = 'Actual incidents') AS Total\_Crime,  (SELECT SUM(VALUE)  FROM IMMIGRATION i  WHERE i.IMM\_YEAR = y.YEAR) AS Total\_Immigration  FROM YEAR\_TABLE y;  SELECT \* FROM yearly\_crime\_immigration\_summary; |
| **Output**   |  |  |  | | --- | --- | --- | | **year** | **total\_crime** | **total\_immigration** | | 2022 | 6415 | 8366544 | | 2023 | 6804 | 12157155 | |
| **Insight**  The yearly crime immigration summary view provides a combined overview of total crime incidents and immigration numbers of years 2022 and 2023. According to 2022 there were 6415 actual crime incidents and 8,366,544 immigrants. In 2023 crime incidents slightly increased to 6,804 while immigration surged significantly to 12,157,155 that is moderate increase of around 6.1% crime and there is rise of nearly 45% immigration year over year. |

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| **Query 11:** Compare 'Rate per 100,000' vs 'Actual incidents' for a Year  SELECT  s.STATISTICS,  SUM(cd.VALUE) AS Total  FROM CRIME\_DATA cd  INNER JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE cd.CRIME\_YEAR = 2023 AND s.STATISTICS IN ('Rate per 100,000 population', 'Actual incidents')  GROUP BY s.STATISTICS; |
| **Output**   |  |  | | --- | --- | | **Statistics** | **total** | | Rate per 100,000 population | 66136 | | Actual incidents | 6804 | |
| **Insight**  The actual crime incidents in Ontario during 2023 reached 6,804 cases which resulted in a population-based crime rate of 66,136 per 100,000 people. The substantial difference results from population scaling because a small number of actual criminal incidents leads to a higher rate when calculated per person. The comparison emphasizes the significance of utilizing normalized indicators, such as crime rate, to analyze public safety impact across regions with different population numbers. |

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| **Query 12:** Cumulative Crimes per Year (Actual + Rate)  SELECT  cd.CRIME\_YEAR,  s.STATISTICS,  SUM(cd.VALUE) AS Yearly\_Total,  SUM(SUM(cd.VALUE)) OVER (  PARTITION BY s.STATISTICS ORDER BY cd.CRIME\_YEAR  ) AS Cumulative\_Total  FROM CRIME\_DATA cd  JOIN STATISTICS s ON cd.STATS\_UNI\_ID = s.STATS\_UNI\_ID  WHERE s.STATISTICS IN ('Actual incidents', 'Rate per 100,000 population')  GROUP BY cd.CRIME\_YEAR, s.STATISTICS  ORDER BY cd.CRIME\_YEAR, s.STATISTICS; |
| **Output**   |  |  |  |  | | --- | --- | --- | --- | | **crime\_year** | **statistics** | **yearly\_total** | **cumulative\_total** | | 2022 | Actual incidents | 6415 | 6415 | | 2022 | Rate per 100,000 population | 62491 | 62491 | | 2023 | Actual incidents | 6804 | 13219 | | 2023 | Rate per 100,000 population | 66136 | 128627 | |
| **Insight**  The annual statistics exhibited continuous expansion during this two-year period through the increase of actual crime incidents along with the crime rate per 100,000 residents. Actual crime numbers climbed from 6,415 to 6,804 across both years and the crime rate increased from 62,491 to 66,136 resulting in total figures of 13,219 incidents and 128,627 rate points. The rising levels of actual incidents and normalized rates suggest increased public safety needs across Ontario together with the requirement to measure crime consistently against population increases. |

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| **Query 13:** Violations Present in the Most Recent Year Only  SELECT DISTINCT v.VIOLATIONS  FROM CRIME\_DATA cd  INNER JOIN VIOLATIONS v ON cd.VIO\_UNI\_ID = v.VIO\_UNI\_ID  WHERE cd.CRIME\_YEAR = (SELECT MAX(CRIME\_YEAR) FROM CRIME\_DATA)  AND v.VIO\_UNI\_ID NOT IN (  SELECT VIO\_UNI\_ID  FROM CRIME\_DATA  WHERE CRIME\_YEAR < (SELECT MAX(CRIME\_YEAR) FROM CRIME\_DATA)  ); |
| **Output**   |  | | --- | | **Violations** | | Total Immigration and Refugee Protection Act | | Homicide | | Murder, first degree | | Total Criminal Code traffic violations | |
| **Insight**  This query shows all violation types which appeared only in 2023. The reported offenses exclusively in 2023 include Homicide as well as Murder (first degree) and Traffic violations and violations under the Immigration and Refugee Protection Act. The data point indicates potential emerging crime trends and classification or enforcement changes although it needs more review to verify if serious violations truly exist in 2023 or if it's mere reporting variations. |

**Visualizations**

1. **Crimes by Violation Type and City (Top Violations View) – Refer Query 01**

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**Explanation:**  This heatmap gives us crucial information on the number of crimes that took place by violation type and the city. The x-axis indicates the cities, while the y-axis indicates the violation type. This heatmap follows a cool-warm color scheme where the red color indicates the highest number of crimes while the blue shades indicate the lowest rate of crimes.

**Key Insights:** The key insight here is that Chatham has zero numbers of the Total Immigration and Refugee Protection Act.

**Recommendations:**

1. Enforcement of strict Traffic laws in cities like Toronto and Mississauga for avoiding such a high rate of traffic violations.
2. The government can invest in Urban Safety Policies to avoid such a high rate of crime violations.
3. **Crime Volume Contribution by City (as % of Total) – Refer Query 02**

**Explanation:** This pie chart provides crucial information about the crime volume distribution across all five cities. It compares the percentage of crime contribution made by each city throughout 2022-2023.

**Key Insights:** Toronto and Mississauga account for 35% and 32% respectively, contributing to the cities with the highest crime rates. While Chatham on the other hand contributes only 3%.

**Recommendations:**

1. Provide more resource allocation to the areas with high crime rates by increasing the police presence, installing more speed cameras, and taking more safety measures.
2. Benchmark the amount of crimes happened in Ottawa and Waterloo to leverage a safer environment.
3. **Most Frequent Violation Yearwise – Refer Query 05**

**Explanation:** The clustered bar chart displays two separate bars that compare the prevailing four violations from 2022 against 2023. Each violation type (X-axis) is represented with two bars—one per year—while the Y-axis shows the number of times each violation was recorded. The method enables users to spot instant changes in the number of violations between 2022 and 2023.

**Key Insights:** Only the Homicide has increased but the other three crimes remained stable throughout 2022-2023.

**Recommendations:**

1. Higher authorities should investigate the data patterns to understand and crack the solutions to limit the crime rates.
2. Having a stable crime rate isn’t a positive aspect, so the government should continue to work on the safety policies of the masses.

1. **Cities with Highest Crime in 2023 – Refer Query 06**

**Explanation:** This bar chart depicts the total number of actual crime events documented in 2023 for each of Ontario’s five largest cities. The x-axis depicts cities, while the y-axis shows the number of crimes reported. This map visually ranks cities from highest to lowest crime rate, making it easy to identify the province’s main contributors.

**Key Insights:** Torontonian and Mississauga residents of Peel Region collectively surpass five hundred thousand crimes (299,776 and 279,468 respectively) marking these areas as established high-crime regions. The low crime reputation of Chatham Kent becomes evident through its reported 26,880 crime incidents. The high urban crime concentration appears to be mainly dueto three factors: population density, infrastructural stress and urban activities.

**Recommendations:**

1. Enforce targeted crime prevention programs in cities with the highest crime rates.
2. Provide proportional funding to the cities to avoid an increase in the crime rates.
3. **Unfounded Crime Reports per City – Refer Query 07**

**Explanation:** This bar chart provides information about the unfounded crime reports investigated by the police in each city. The x-axis depicts the unfounded reports, while the y-axis depicts the city.

**Key Insights:** Here, the crucial insight is that even if Ottawa is not among the cities with the most crimes, it has the most unfounded reports, which is not a positive aspect.

**Recommendations:**

1. This highlights the need for increased law enforcement in the Ottawa region.
2. Educate public on reporting crimes properly to maintain a safe environment.
3. **Categorize Cities by Crime Volume using CASE – Refer Query 08**

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**Explanation:** The comparison through clustered column type provides data points that represent crime statistics across cities between 2022 and 2023. The graph contains cities on the X-axis and total crime data on the Y-axis. This graphic contains two vertical columns that represent each year and connect using lines to showcase direction changes. The graphic enables grouping cities into categories by crime count through the application of CASE logic.

**Key Insights:** Toronto (299,776 in 2023) and Mississauga (279,468) had consistently high crime rates in both years, exceeding the 150,000+ benchmark. Medium-crime cities include Ottawa and Waterloo, with populations ranging from 115,000 to 135,000 and consistent crime rates. Chatham Kent has a low crime rate, with less than 27,000 crimes reported in both years.

**Recommendations:**

1. Introduce intensive crime monitoring in cities with consistent crime rates to set them as the benchmark.
2. Introduce severe judicial actions on the offences to limit the increment.
3. **View: Yearly Crime and Immigration Summary – Refer Query 10**

**Explanation:** The combo chart depicts total immigration (bar chart) and total crime (line chart) and provides a direct visualization of the yearly crime and immigration summary from 2022-2023. This helps us to visualize the trend without facing any difficulty.

**Key Insights:** Between 2022 and 2023:

* The immigration population rose almost 45% (8.37 million to 12.16 million).
* The number of observed crimes rose by approximately 6 percent between these two years between 6,415 and 6,804 cases.

The data shows that immigration amounts rose substantially, yet crime statistics stayed constant, thus disproving the theory that immigration causes crime.

**Recommendations:**

1. Address the public misconceptions through these insights, proving the independencies.
2. Dive more deeply into the analysis via regression or predictive analysis through machine learning to understand the connection and trends between both aspects.
3. **Cumulative Crimes per Year (Actual + Rate) – Refer Query 12**

**Explanation:** The stacked area charts show the cumulative crimes that happened in the year 2022-2023, depicting the actual incidents and the rate per 100,000 population. This gives us a clear view of the growth trend and the proportional distribution of the crime matrix.

**Key Insights:** There is a steady upward trend in the stacked area chart, that indicates either more immigration or more crimes.

* Actual incidents increased from 6,415 to 6,804.
* The rate per 100,00 increases from 62,491 to 66,136.
* Cumulative totals climbed to 13,219 (incidents) and 128,627 (rate) by 2023.

**Recommendations:**

1. Use year-over-year cumulative details to understand the abnormal spikes and take preventative measures accordingly.

**Conclusion**

This project explored the relationship between immigration and crime in Ontario cities using SQL-driven analysis from real data from 2022 and 2023. Referring to the visualizations and the outputs, we understood that crime statistics grew simultaneously with the immigration levels, but there was no evident linear relationship between them as Toronto and Mississauga maintained high crime rates throughout the years following the immigration shifts. Assuming that data collection techniques and reporting criteria are consistent among municipalities. If this is true, the consistency of the highest priority violations, together with consistent crime patterns, suggests that population density may be the key factor driving criminal activity clusters, but it is not confirmed through this analysis. However, there are chances of a nearly 50-60% increase in the immigration rates as per the current pattern and analysis. Looking forward, an increase in population does not always result in increasing crime levels in cities, even though it might require more law enforcement and infrastructure. Crime patterns in the future will be mostly influenced by governmental decisions and policing methods, as well as urban development practices, rather than immigration rates.