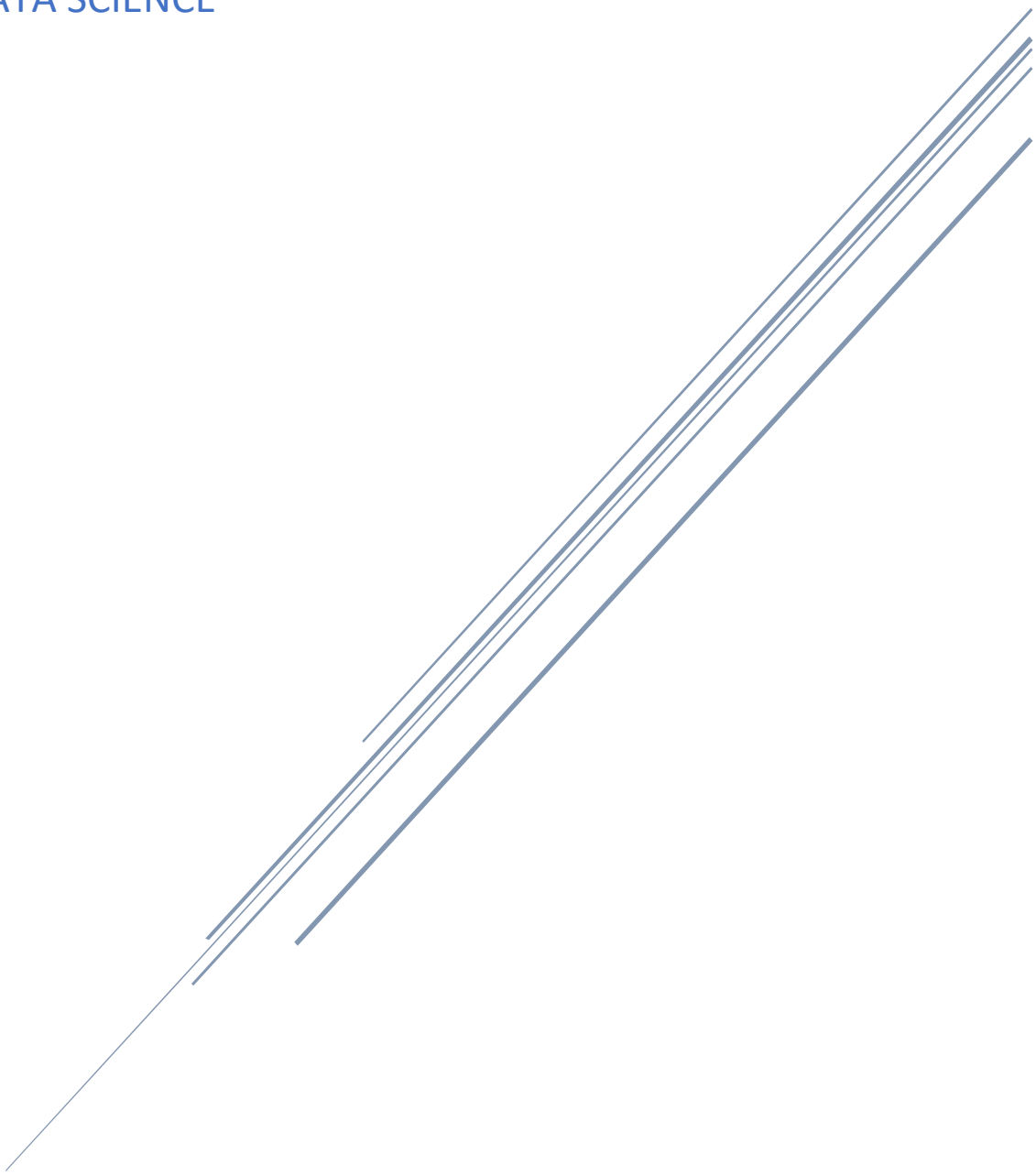
ANALYZING CRIME RATES IN ARGENTINA: TRENDS AND STRATEGIES FOR REDUCING CRIMINALITY

IBM DATA SCIENCE



Capstone Project

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Introduction

The present Data Science project aims to conduct a comprehensive analysis of data related to the number of homicides in Argentina. The analysis will focus on the records of homicides that occurred in the country during the period between 2015 and 2021.

The increase in violence and homicides is a constant concern for society and authorities. Understanding the trends and patterns surrounding these events is essential to implement effective policies and strategies that contribute to the safety and well-being of the population.

Business Problem

The Government of the Argentine Republic is seeking to address a critical concern related to public safety and crime rates within the country. As part of their efforts to ensure the well-being and security of the population, they are interested in understanding the current state of homicides in Argentina and identifying any potential trends or improvements.

The primary objectives of this Data Science project are twofold:

Trend Analysis: The government aims to determine whether the number of homicides in Argentina has decreased or remained stable over the years between 2015 and 2021. Understanding the overall trend will help them gauge the effectiveness of existing policies and interventions targeting crime reduction.

Causative Factors: Additionally, the government seeks to identify the underlying causes and contributing factors behind homicides in Argentina. Gaining insights into the various elements that lead to these tragic events will enable the government to design targeted initiatives and interventions to prevent and address these issues more effectively.

By conducting a thorough analysis of the available data on homicides in Argentina, this Data Science project will provide valuable information to the government. The insights obtained through this analysis will aid in informed decision-making, allowing the government to implement evidence-based strategies to improve public safety, reduce crime rates, and foster a safer environment for all citizens.

Data

To achieve these objectives, the data for this Data Science project was obtained from the following database: https://dataunodc.un.org/dp-intentional-homicide-victims. The dataset contains comprehensive records of intentional homicide victims reported to and compiled by the United Nations Office on Drugs and Crime (UNODC).

Homicide Data

The dataset's wide geographical coverage and extensive time range make it an invaluable resource for gaining a deep understanding of the complex patterns and dynamics of homicides across different regions and over several decades. By exploring this dataset, we can unearth critical insights that can contribute to the formulation of evidence-based policies, strategies, and interventions aimed at reducing homicides and enhancing public safety worldwide.

Region	Subregion	Country	Category	Age	Sex	Source	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	20
Africa	Northern Africa	Algeria	Total	Total	Female	CTS			52	39	85	71	75	56	86	86	122	160	
					Male	CTS			195	170	492	475	467	468	482	433	532	535	
					Total	CTS	254	280	523	480	577	546	542	524	568	519	654	695	
		Egypt	Total	Total	Female	CTS/External	197	331	262								165	296	
					Male	CTS	1,642	2,372	1,945										
					Total	UNSDC/CTS/External	1,839	2,703	2,207		2,890	1,711	1,532	1,360					
		Morocco	Total	Total	Female	UNSDC/CTS			56	66	59	97	105	113	70	117	84	99	
					Male	UNSDC/CTS			327	363	296	334	489	648	440	510	374	617	
					Total	UNSDC/CTS	451	441	383	429	355	431	594	761	510	627	458	716	
		Tunisia	Total	Total	Female	External										103	115		
					Male	External										468	447		
					Total	WHO/External	286		332							571	562		
	Sub-Saharan Africa	Angola	Total	Total	Total	NSO		1,055	1,217			1,254	1,196						
		Botswana	Total	Total	Female	NP											114	100	
					Total	WHO/NP	303										221	273	

Argentina

For the specific analysis focused on Argentina, we have chosen to narrow down the dataset to include data only from the years 2015 and 2021. By doing so, we aim to gain a more detailed understanding of the homicide trends and patterns within the country during these particular years. This selective approach will enable us to perform a more focused analysis that is relevant to the current situation in Argentina and identify any significant changes or developments in homicides over this specific time frame.

Region	Subregion	Country	Category	Age	Sex	Source	2015	2016	2017	2018	2019	2020	2021
Americas	Latin America and the Caribbean	Argentina	Total	Total	Female	CTS	387		408	396	408	371	308
					Male	CTS	2,450		1,909	1,988	1,895	2,044	1,785
					Total	MoS/CTS	2,837	2,625	2,317	2,384	2,307	2,417	2,093

Methodology

Data Collection

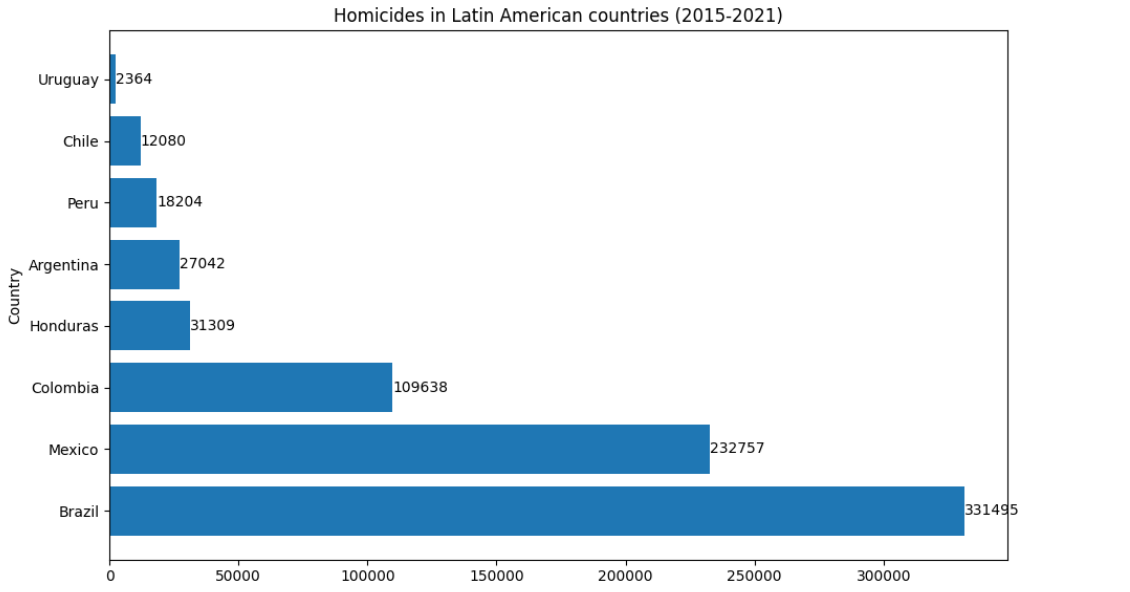
Data is loaded from an external URL using the pandas library to read the Excel file and store the data in a DataFrame.

```
import pandas as pd
import matplotlib.pyplot as plt
import ssl

ssl._create_default_https_context = ssl._create_default_https_context = ssl._create_unverified_context

url = 'https://dataunodc.un.org/sites/dataunodc.un.org/files/data_cts_intentional_homicide.xlsx'
df = pd.read_excel(url, header=2)
```

Data Wrangling

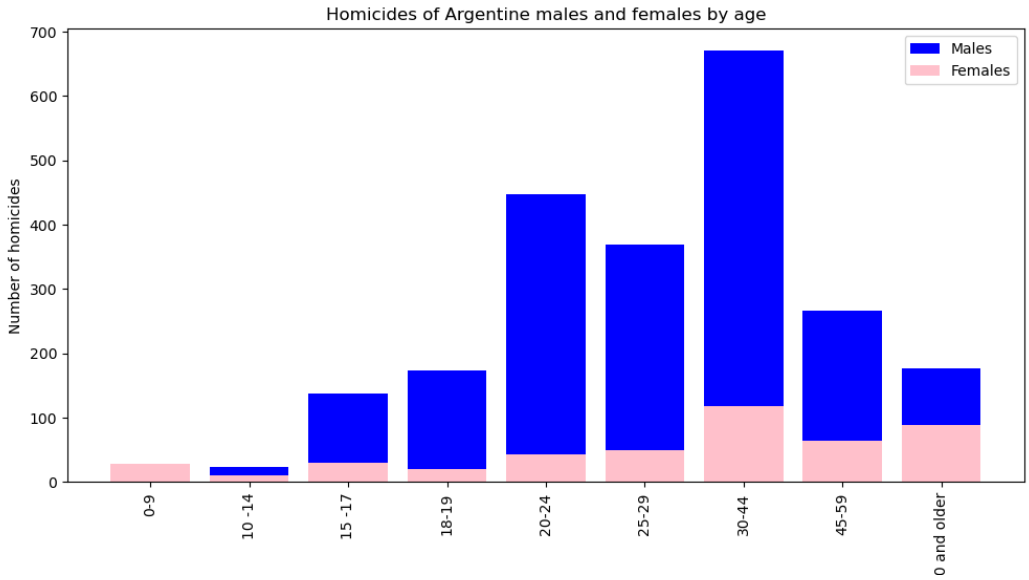
Data filtering is performed using conditions based on specific columns of the DataFrame to select relevant data for each graph.

```
# Filter the data for the total of Year, Dimension, Category, and Sex
df_filtered = df[(df['Year'].between(2015, 2021)) & (df['Dimension'] == 'Total') & (df['Category'] == 'Total') & (df['Sex'] == 'Total') & (df['Unit of measu

# Select the desired countries
selected_countries = ['Argentina', 'Brazil', 'Mexico', 'Colombia', 'Chile', 'Peru', 'Honduras', 'Uruguay']
df_selected = df_filtered[df_filtered['Country'].isin(selected_countries)]
```



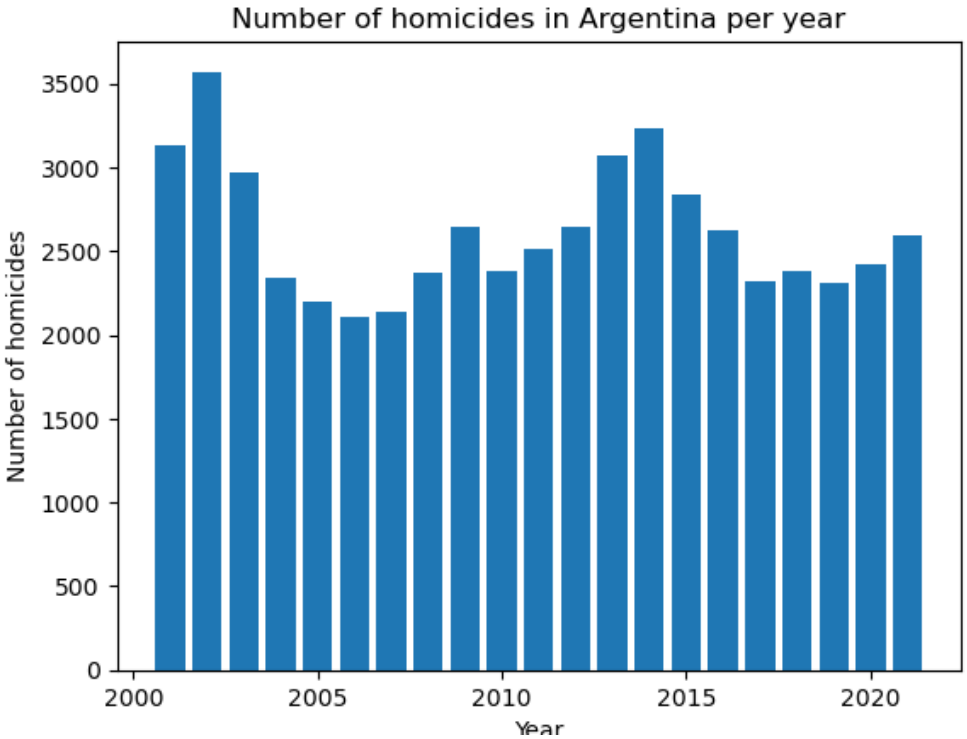
Exploratory Data Analysis (EDA) with Visualization

The matplotlib and pandas libraries are used to create different graphs that help explore and visualize the data. Horizontal bar charts, bidirectional bar charts, line charts, and pie charts are generated to display information about homicides in Latin American countries, homicides by age and gender in Argentina, and the distribution of homicides by category in Argentina.

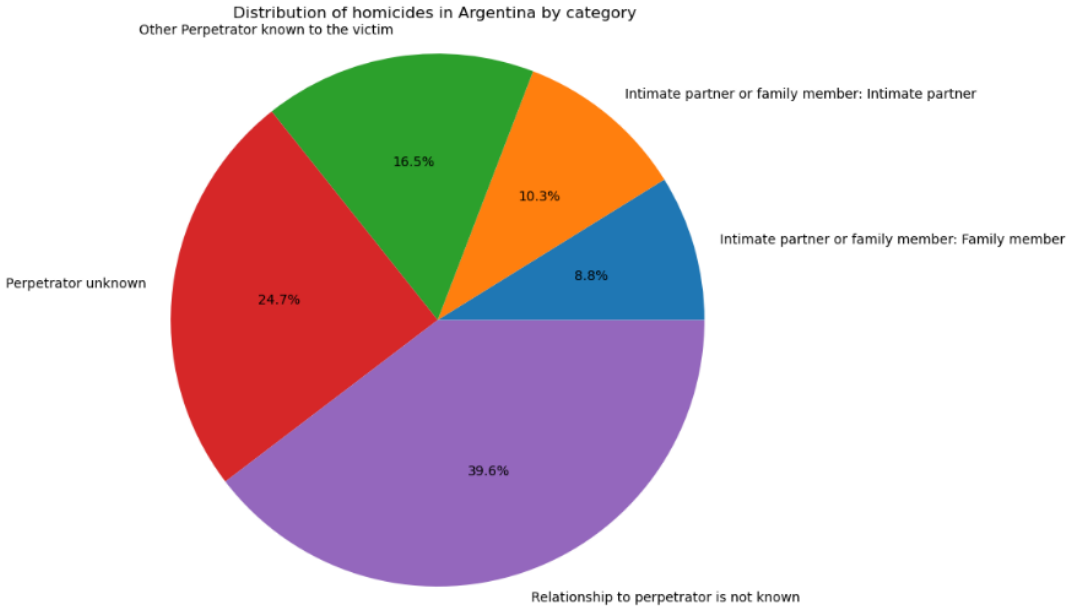


In this chart, it can be observed that homicides committed by men increase from the age of 19 to 44. Additionally, women show a very low tendency to commit homicides.

Here we can see that the years 2002 and 2014 had the highest peaks of homicides committed in Argentina, with 2002 standing out as one of the years with the highest number of murders. From 2015 onwards, these numbers started to decline.

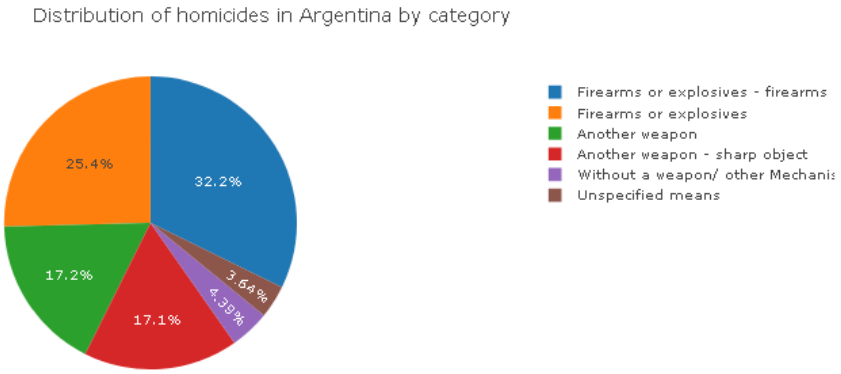


In this pie chart, we can observe that the majority of homicides are committed by individuals whose relationship to the victim is unknown, followed by cases where the perpetrator is completely unknown to the victim. This suggests that these murders might be related to robbery incidents.



Dash Dashboard

The Dash library is utilized to create an interactive panel that showcases the pie chart for the distribution of homicides by category in Argentina. Dash is a Python library for building interactive web applications based on data.



Finally, in this chart, it can be observed that homicides are mostly committed using firearms, followed by other unspecified weapons and sharp objects.

Discussion

After conducting a thorough analysis of homicide data in Argentina, we have arrived at some significant conclusions that can inform policy and preventive measures. The data exploration and visualization revealed essential insights that shed light on the trends and patterns surrounding homicides in the country.

One of the key findings is the decline in homicides starting from the year 2015. The data clearly shows a decrease in the number of reported homicides in Argentina since 2015. This decline is encouraging, and it indicates that certain measures or policies may have contributed to this positive change in the overall homicide rate.

Another crucial observation is the age and gender distribution of perpetrators involved in homicides. From the analysis, it is evident that homicides committed by men tend to increase from the age of 19 until around 44 years old. On the other hand, female involvement in homicides is relatively low throughout the observed age groups. This highlights the need for targeted preventive strategies focused on addressing the factors that contribute to male-related violent behavior, particularly in the specified age range.

Moreover, the data visualizations also brought to light the prevalent use of firearms, followed by other unspecified weapons and sharp objects, in the commission of homicides. This suggests the importance of implementing preventive measures regarding the control and regulation of firearms and other dangerous weapons to curb the prevalence of lethal crimes.

Based on these findings, it is evident that the efforts to reduce homicides have shown some success, but there is still much work to be done. Policymakers and relevant authorities should consider these insights to design and implement more effective crime prevention strategies, focusing on addressing the factors that contribute to violence among males in the specific age group. Additionally, measures to control and regulate the possession and use of firearms and other dangerous weapons should be prioritized to further reduce the occurrence of lethal crimes.

Overall, this data-driven analysis provides valuable information to the government of Argentina to make informed decisions and implement targeted measures to tackle the issue of homicides effectively and ensure the safety and well-being of its citizens.

Conclusion

In conclusion, this Data Science project has successfully conducted a comprehensive analysis of homicide data in Argentina, revealing a decline in homicides since 2015 and a significant correlation between male perpetrators and the age group of 19 to 44. The prevalent use of firearms and other dangerous weapons in the commission of homicides was also identified. These findings highlight the need for targeted strategies to address male-related violent behavior and stricter measures to control weapon-related crimes. By leveraging these insights, the government of Argentina can make informed decisions and implement effective crime prevention policies, ensuring the safety and well-being of its citizens and fostering a safer environment for the nation. The use of data analysis and Python's powerful libraries has been instrumental in providing valuable information for data-informed decision-making.