Uruguayan Crimes

July 25, 2025

1 Introduction

This is a report made based on the analysis of the crimes reported raw data that we can find on the uruguayan goverment data list.

I found and used two datasets, one that contains mostly data about crimes commited between 2013 and 2025, while the other contains only homicides that took place between 2015 and 2025.

I made this to contrast what I thought is happening in the country to what it really is happening. This helped me make some interesting discoveries either about whether a neighborhood in Montevideo is safer than other, some possible causes, check that domestic violence is not only important to take care of but it is increasing over the years.

This is not only interesting information that we can get, but we can use what we retrieved and use it with other reports to get to a deeper point of understanding about what is really happening in the territory.

For this analysis I used Python, with the main libraries for this, as pandas, matplotlib, seaborn and others. Also most of this project uses SQL and a personal DB made using MySQL where I uploaded and extract the clean and raw data to make different queries as to retrieve information for punctual conclusions and verify my thoughts. This paper is made entirely using Jupyter Notebook and LaTeX.

You can find the notebook and other files related to this report, and the different codes for the graphs on my Github repository.

2   Uruguayan reported crimes

2.1   What is this about?

Using the dataset with other crimes reported from the Ministerio del Interior we will try to get to know some things: - The anual growth of crimes on Uruguay, per department and in general. - The trend on crime types over the years. - What is happening with the most crime reported neighborhoods over the years?

We can fing the metadata containing what each column means here.

2.2   Data Insight

There is some columns that we don't need or we won't be using for this analysis, so I decided to clean and extract only what we are going to use.
This ensures more optimal and efficient results, also the data is uploaded to my SQL server as to not need to query it all every time we open this notebook.

Columns:
- crime : Crime type - date : Date of the crime - year : Year of the crime - month : Month of the crime - dept : Department of Uruguay where the crime took place - barrio : Neighborhood on Montevideo where the crime took place.

Total: 2296511 crimes reported.

Starting date: 2013-01-01

Last date: 2025-03-31

I decided to make the 5 dataframes needed to each point of the analysis, and labeled as I needed to:
df_crimes_year_dept : Contains yearly crimes splitted by departments.
df_crimes_year : Contains all the crimes accumulated per year.
df_montevideo : Contains all crimes ocurred in Montevideo.
df_crime_type : Contains all crimes accumulated by crime, year and month.

2.3   Yearly growth for each department

I found interesting to know how does the crime rate and evolution changes between the different departments in Uruguay, for this I decided to do the following plot.
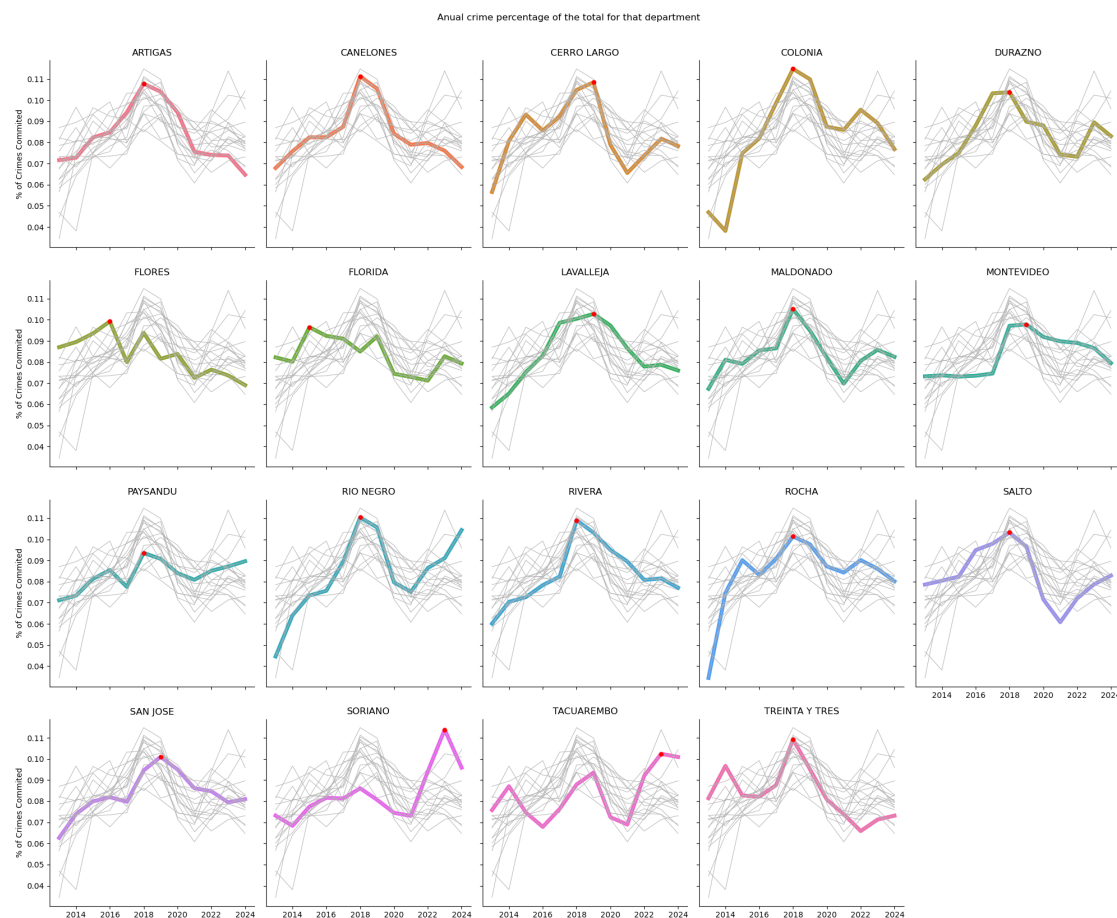
Fig 1. Crime evolution per department of Uruguay.

The figure we can see above has 19 plots, one for each departments where each contains both their own growth over the time colored and the other other departments line plotted in gray.
The red dot we see is the maximum point in which year the department got it's climax of crimes commited.

Having a look at this graphs we can see something interesting.
In 17/19 departments there was a big spike on crime reports between 2018-2019.
As it may have been expected, on 2020 due to the global pandemic there was a decrease on all the departments.

On the whole region we can not only see that max and big spike in reports from 2017 to 2018 being almost an increase of: 25% corresponding to previous year. Also after the pandemic the crime rate seems to be normalized and seems to be decreasing since 2022.

After some research on different important news websites like La Diaria or El Observador, there was indeed an increase, but the percentaje of mugging was way higher than the increase of crimes between 2017 and 2018, being around the 50%+, this was something alarming in that year.
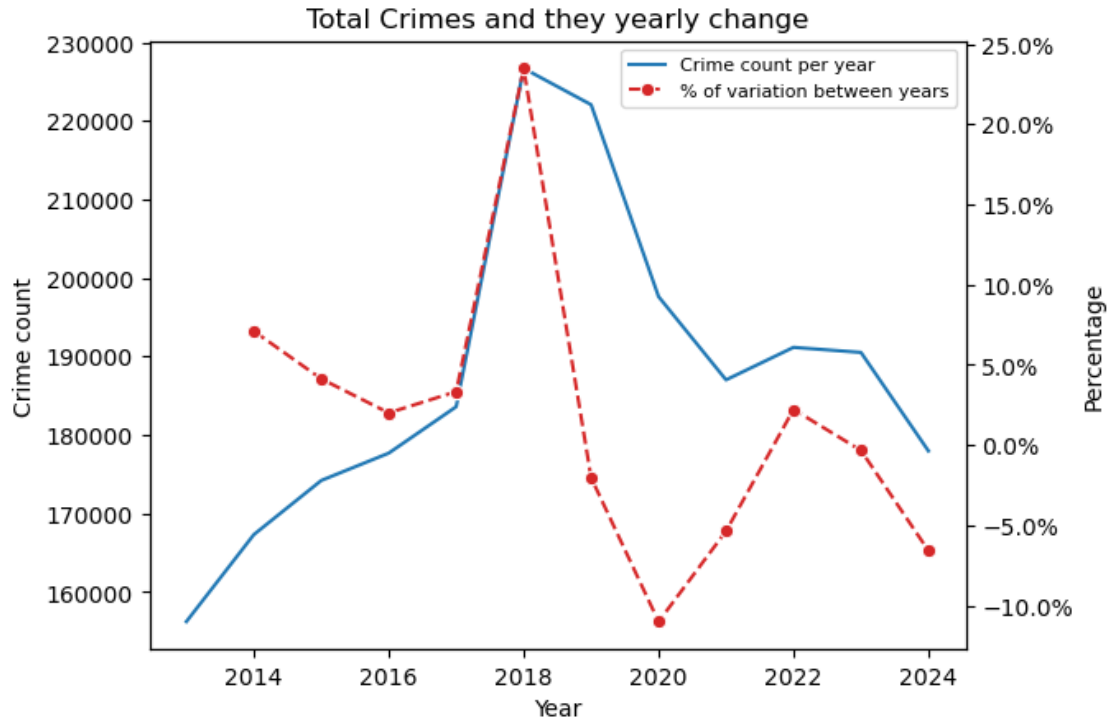We are going to talk about this on the following sections.

Fig 2. Crime evolution and variation in the country.

Over this graph we can see and confirm what we saw before, there was not only a raw increase in crime but an interesting and fast growth rate for the crime in 2018 specially.
In 2018 the crimes got around 23% up from 2017, and got a drastric drom from 2019 to 2020 of a 10% less.

It's clear that after the pandemic effects, the crime was going to increase as we can see it get around a 5%-10% increase between 2021 to 2022, nowadays it seems to be going down.

2.4 Theft got the first place. Concerned about Domestic Violence

In this part we want to know which crimes are more common to happen, and they evolution since 2013 to previos year.

From the metadata we found that there are this type of crimes: - Hurto : Theft - Rapiña : Mugging - Violencia Domestica : Domestic violence - Lesiones : Injuries - Abigeato : Cattle rustling

Fig 3. Crime trends over the years.

```
[47]: year                  2013     2018     2020     2024
      crime
      ABIGEATO               1059     1794     2206      852
      HURTO                101453   145973   118783   107845
      LESIONES               9370    12069    11408    11780
      RAPIÑA                18035    29885    28757    17480
      VIOLENCIA DOMÉSTICA   26288    36946    36445    39990
```
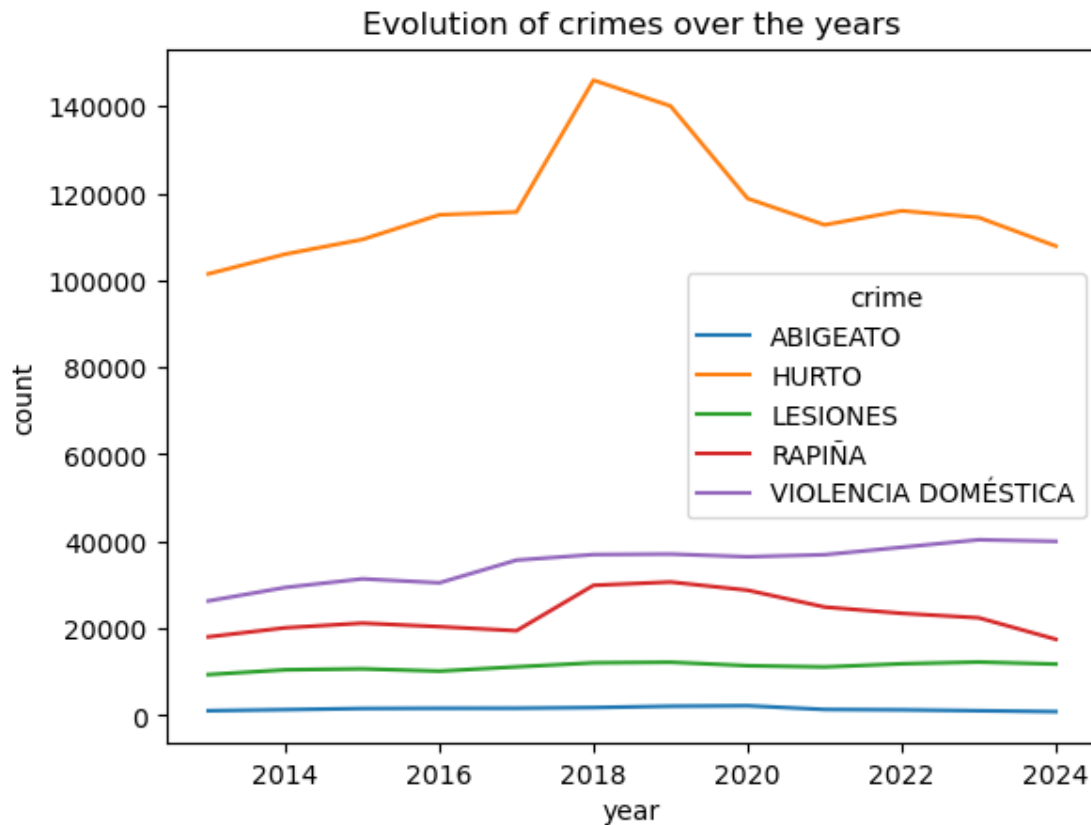
Using the plot and looking on the resumed data where we choose 4 different years we can see some interesting things.

- Abigeato has decreased a lot since 2021, being on the all time low on 2024.
- Hurto has it's peak on 2018 as well as Rapiña did.
- Hurto is the most current type of crime.

- All the crimes are currently decreasing over the time except domestic violence.
- Domestic violence seems to be increasing steady and slowly over the years, on 2023 it got it's max.

These are really concerning results, we are going to talk more about **domestic violence** in the homicides section, where we are going to see how many women were killed by their couples, specially on 2023.

Also, as we found before, Rapiña (mugging) got the increase that was being talked about, it rised from around 20 thousand to almost 30 in just one year, being this an 50% increase in this type of crime for that particular year, nowadays we can see that it started to lose more and more traction being it less common on frequent years, same is happening with theft.

2.5 Summer, where the most crimes are commited

On the following plot we can see that most of the crimes take place on the summer season of the year.
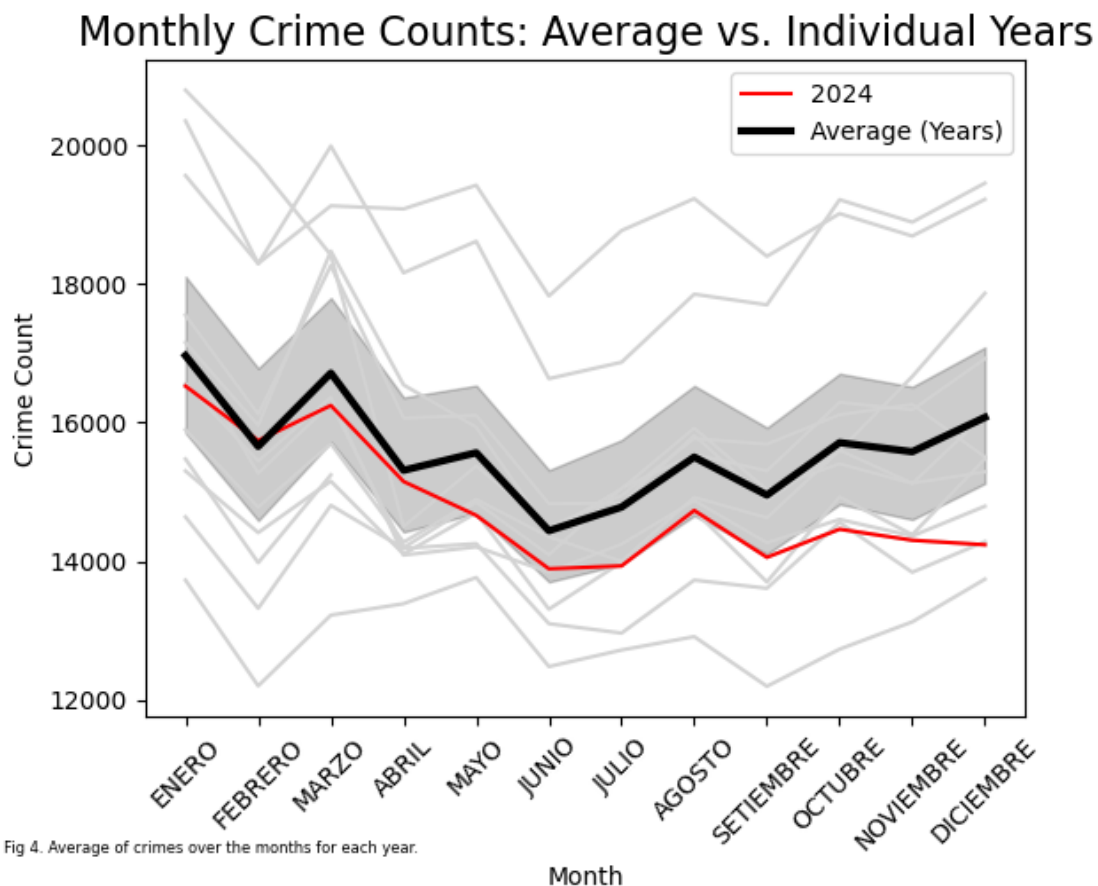This may be caused due to people going out more in the summer than in the winter.

Some houses got not being taken care of during vacations, people walk more freely since there is no cold.

It is interesting to see that domestic violence does have the same behavior. After some research I found from a C.A.W.C (Connections for abused women and their children) website that indeed the summer affects the domestic violence rate by the physiological effects of the heat that lead to irritability and heightened stress.
Also states that heat also cause sleep deprivation which is linked to increases irritability and lower impulse control.

It's important to note that most of 2024 is below the average for each part of the year (except february), this is good news.

Fig 4. Average of crimes over the months for each year.

2.6 Neighborhoods and crime report impact over the years

I want to know what happens in the most crime commited neighborhoods and how do they behave in the next years.

For this we will make a Choropleth map using the neighborhoods of Montevideo where the more red a neighborhood is the more crimes have been reported.
I found the shapefile in this github repository made by Vierja.
After some standarization in the data we retrieved from M.Interior, we manage to match the shapes for each corresponding neighborhood and now we have this maps.
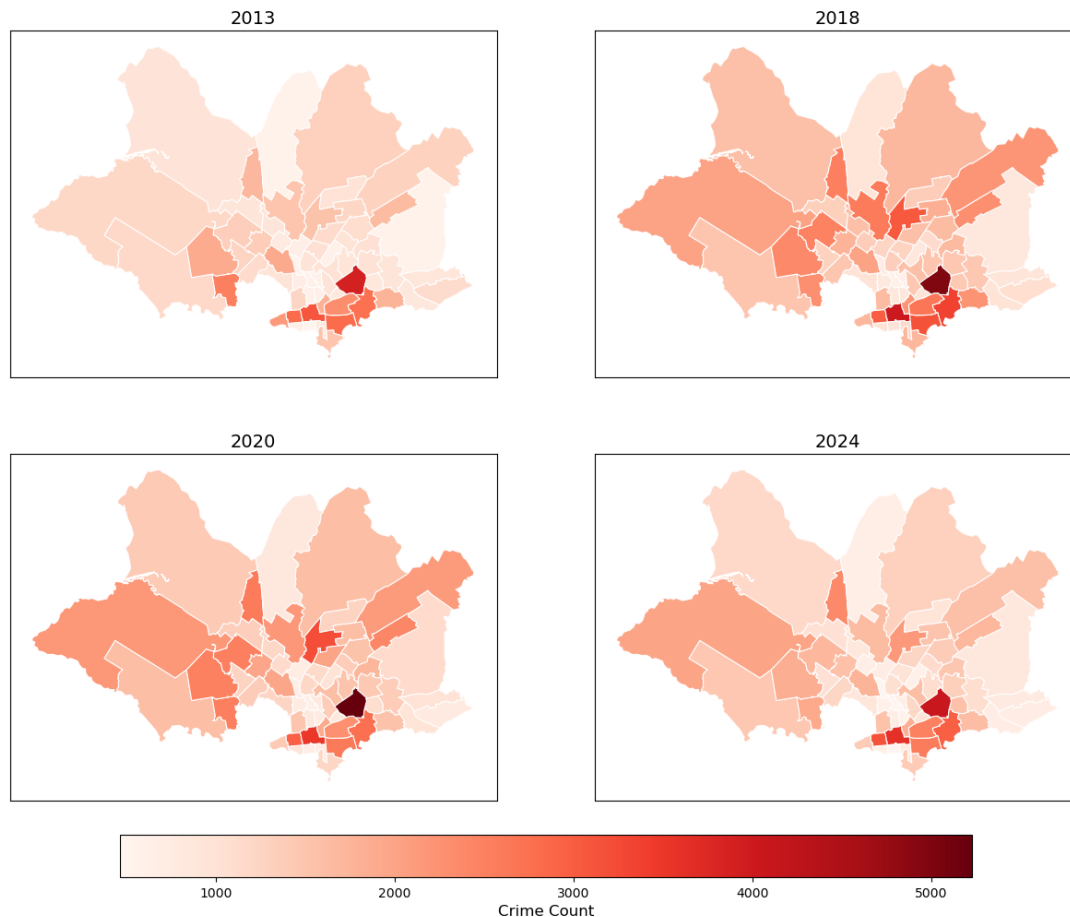

Fig 5. Heatmap of Montevideo's neighborhoods for years 2013, 2018, 2020 and 2024.

In the Montevideo map over the years we can see how the zones that did not have that much crime (reported) on it on the outsides, specially on the northwest, starts to gather more and more reports, and near zones to them like Cerro started to dismiss the crimes.
It is important to note that now zones like Centro and Ciudad Vieja start to have more crimes over the years.

The south part of Montevideo stays almost the same, being between the most crime repported

zone.

It is well noted that Union stayed on the top 1 of most crime reported neighbors, where the crime that was most reported in last year was theft (Hurto) and Mugging (Rapiña).

We don't know the exact nature of some reports, but we can estimate that some zones started to gain more reports as they get out from the center in newer years.

Keep in mind that these does not mean that they are the most insecure neighborhoods, got example, in Pocitos, most of the crimes reported on previous year are theft, but mugging is less common than domestic violence.

This is an important distinction, since in Uruguay "Hurto" is classified as theft without violence, while mugging states that it is indeed with violence.

In that centric or southern zones is normal to have more crimes reported since they are more crowded, also we can state that the violence on this zones is often less than on more periferal zones, for example in Cerro, mugging is almost 4 times more frequent than in Pocitos.

If we calculate a relationship between the amount of crimes with violence that were commited on the southern neighborhood to the periferal, we can estimate that most of them are going to be like 2 or 3 times greater than in the ratio in the southern.

Conclusion: To conclude, we manage to see that the neighborhoods that got the most crimes stayed almost the same on every year. Some of them are starting to decrease, like Pocitos, but most of the southern ones, they are not related to mugging.

Most of this calculations were made by queries on SQL and checking some of the top 5, southern and periferal neighborhoods

2.6.1 Top 5 most crime reported neighborhoods

Year 2013

```
       barrio  year  crime_count
754     UNION  2013         3899
273    CORDON  2013         3098
182    CENTRO  2013         2825
624   POCITOS  2013         2822
91      BUCEO  2013         2745
```

Year 2024

```
       barrio  year  crime_count
765     UNION  2024         4066
284    CORDON  2024         3622
193    CENTRO  2024         3148
102     BUCEO  2024         2989
635   POCITOS  2024         2577
```

2.6.2 Top 5 least crime reported neighborhoods

Year 2013

```
              barrio  year  crime_count
26         ATAHUALPA  2013          527
```

```
546               PALERMO  2013          527
52    BAÑADOS DE CARRASCO  2013          562
247 COLON SURESTE ABAYUBA  2013          568
169     CASTRO CASTELLANOS  2013          578
```

Year 2024

```
                  barrio  year  crime_count
37              ATAHUALPA  2024          461
557               PALERMO  2024          464
297              FIGURITA  2024          480
375           LA COMERCIAL  2024          562
180 CASTRO CASTELLANOS  2024          594
```

2.7 Conclusions of this part:

After the analysis of more than 2.2 million reported incidents along the years 2013-2025, reveals an interesting trend in the territory.
In 2018-2019 there was an increase in almost every crime, this came to drop over the Covid-19 pandemic, this is pretty much visible in almost every department making this not an isolated effect of Montevideo but a more widespread phenomenom.

Since 2018 peak where theft and mugging (Hurto y rapiña) got it's maximum, there is a decrese on this type of crime, but on the contrary, domestic violence shows a persistente and steady increase over the years, this is critical for the population on Uruguay, and should be taked more into perspective.

It's notable to see that most of the crimes ocurr during summer time of the year and not over the winter, this is something we could study more deeply. Is this caused by people going outside of the country? People not going out that often on winter? The day being shorter?.
This are some questions we can ask and analyze over in another paper.

To finish, Montevideo being the capital shows that most of the violent crimes occur outside the centric/south zone, but this zones keep increasing the crimes that happen, also this shows that zones where there was not common to report crimes are starting to get more and more reports over the years.

3 Homicides

The data set we used did not include homicides, this is obtained from this different data set that comes from this page.

From this we can retrive the next information:

- Year, Month, Time, Department
- Weapon classications (Fire, Hand, White, etc)
- Minors involved (Did minors participate on the homicide?)
- Relationship (What the relationship between the victim and aggresor was)
- Cause (Why did it happen)
- Sex, Age

Some of this are not known since not every homicide has all the data, but there are some questions we can ask and provide an answer: - Does the minor participants rate increased over the years? - Are most of this crimes commited under passion, or simply mugging. - How many people die under Domestic violence, and how much of those are women? - What weapon is the most used in a homicide?

jupyter nbconvert --to pdf --TagRemovePreprocessor.remove_input_tags="{'hide_input'}" "Uruguayan Crimes.ipynb"

[ ]: