

# Uruguayan Crimes

July 23, 2025

## 1 Uruguayan reported crimes

### 1.1 What is this about?

Using the dataset from the Ministerio del Interior we will try to achieve some analysis about this things: - The anual growth of crimes on Uruguay, per department and in general. - The trend on crime types. - Does the neighbor with the most crimes reported got better over the year? And viceversa? - Homicides

The dataset can be found [here](#) It has over 2 million rows being extremely helpful for my learning. What each column has can be found [here](#)

### 1.2 Data Insight

From the data that was retrieved I decided to only get some of these columns for this view. After some cleaning on the data I got this results:

**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

Now that we have correctly upload the data to this file lets start by reviewing what we want to do.

Starting from the first one, we want to retrieve the anual growth of crimes on Uruguay, filter this by department and in general.

I know we can retrieve the data from SQL but my main objective is to learn to do it with Pandas.

We want to group the data by years and then we can use it to split it between departments, see the trend and see if it gets better or worse overtime.

2025 was excluded since there is data only up to march 31.

**df\_crimes\_\_year\_\_dept :** Contains yearly crimes splitted by departments.

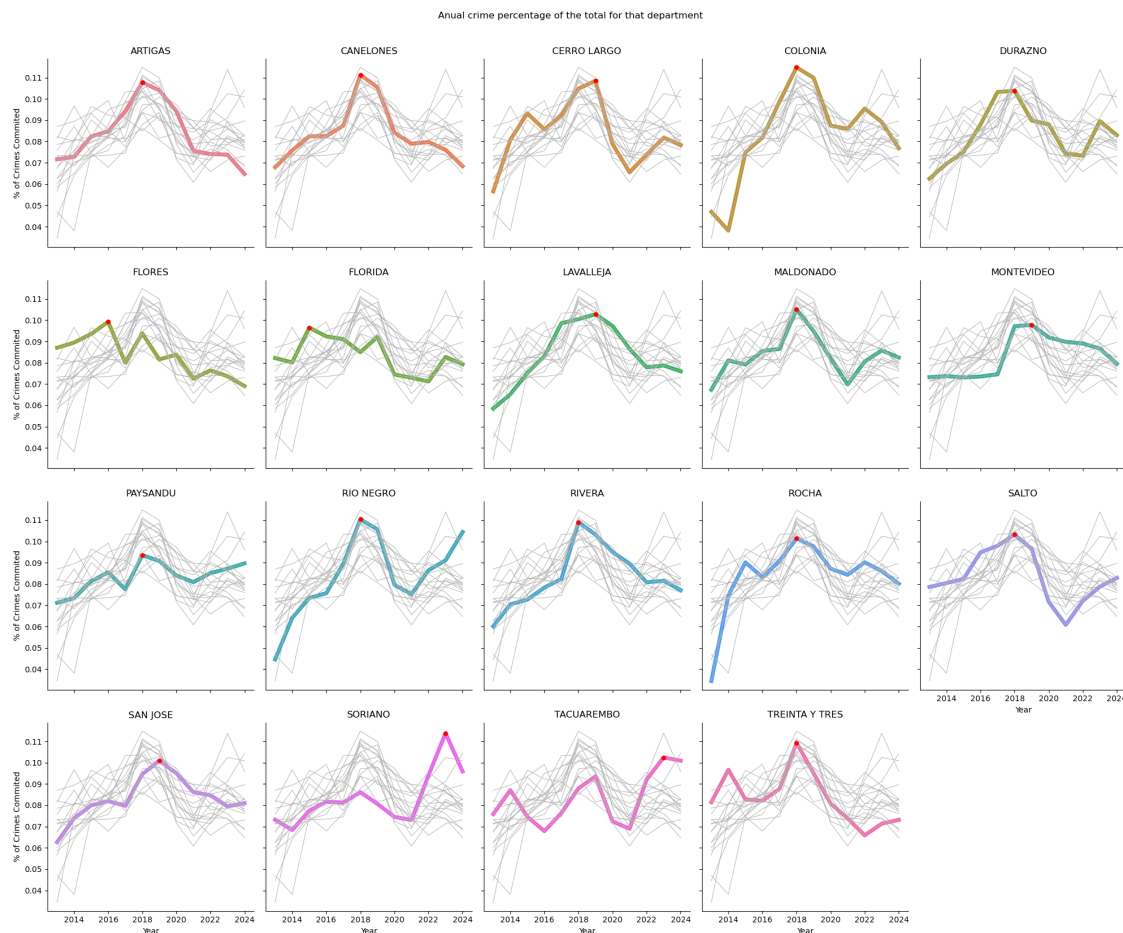
**df\_crimes\_\_year :** Contains all the crimes accumulated per year.

**df\_montevideo :** Contains all crimes occurred in Montevideo.

**df\_crime\_\_type :** Contains all crimes accumulated by crime, year and month.

### 1.3 Yearly growth for each department

To answer our first question we need to create some visualizations, we will start with a facet grid to see the yearly crimes individually.



Main plot code:

```
g = sns.relplot(
    data = df_crimes_year_dept,
    x = 'year', y = 'percentage', col = 'dept', hue = 'dept',
    kind = 'line', linewidth = 5, col_wrap = 5, height = 4, legend=False
)
```

Within this graphs we can see something interesting.

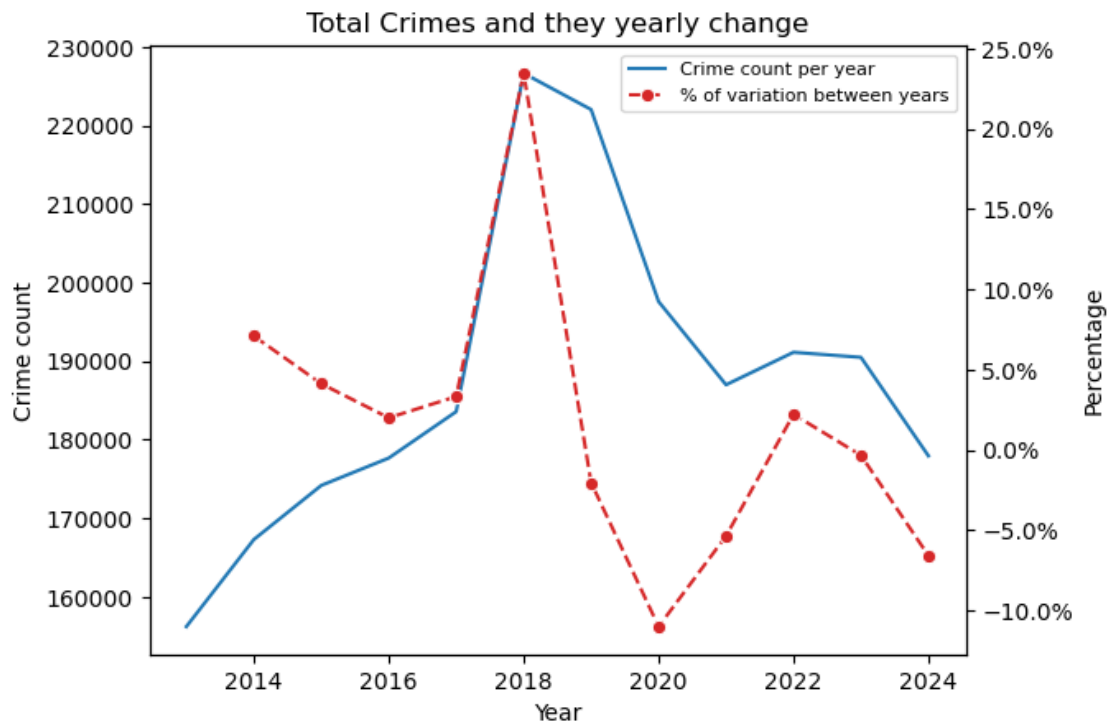
In 17/19 departments there was a big spike on crime reports between 2018-2019.

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, I will research why this did happen.

Also after the pandemic the crime rate seems to be normalized and seems to be decreasing since

2022.



Codes for blue and red graph

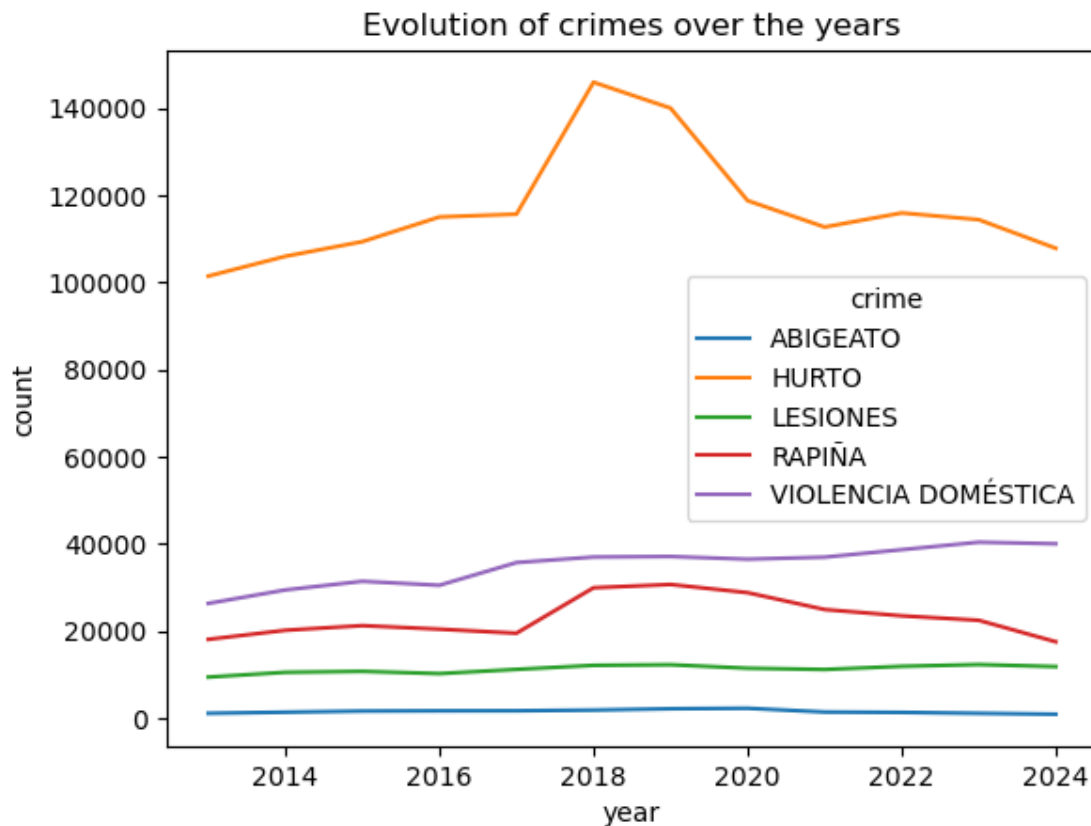
```
sns.lineplot(
    data = df_crimes_year,
    x='year', y='crime_count', ax=ax1,
    color = "tab:blue", label="Crime count per year", legend = None,
)
sns.lineplot(
    data =df_crimes_year,
    x='year', y='yearly_change', ax=ax2,
    color="tab:red", ls='--', label="% of variation between years",
    legend = None, marker = 'o'
)
```

## 1.4 Theft got the first place. Concerned about Domestic Violence

We need to see which one is the most trending to happen and know they behavior, are they decreasing, increasing or keeping stable for each 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

```
[79]: 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
```



```
sns.lineplot(
    data = df_yearly_crime_type,
    x='year', y='count', hue = 'crime',
)
```

Using the plot and looking on the resumed table 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.

This is really concerning insights.

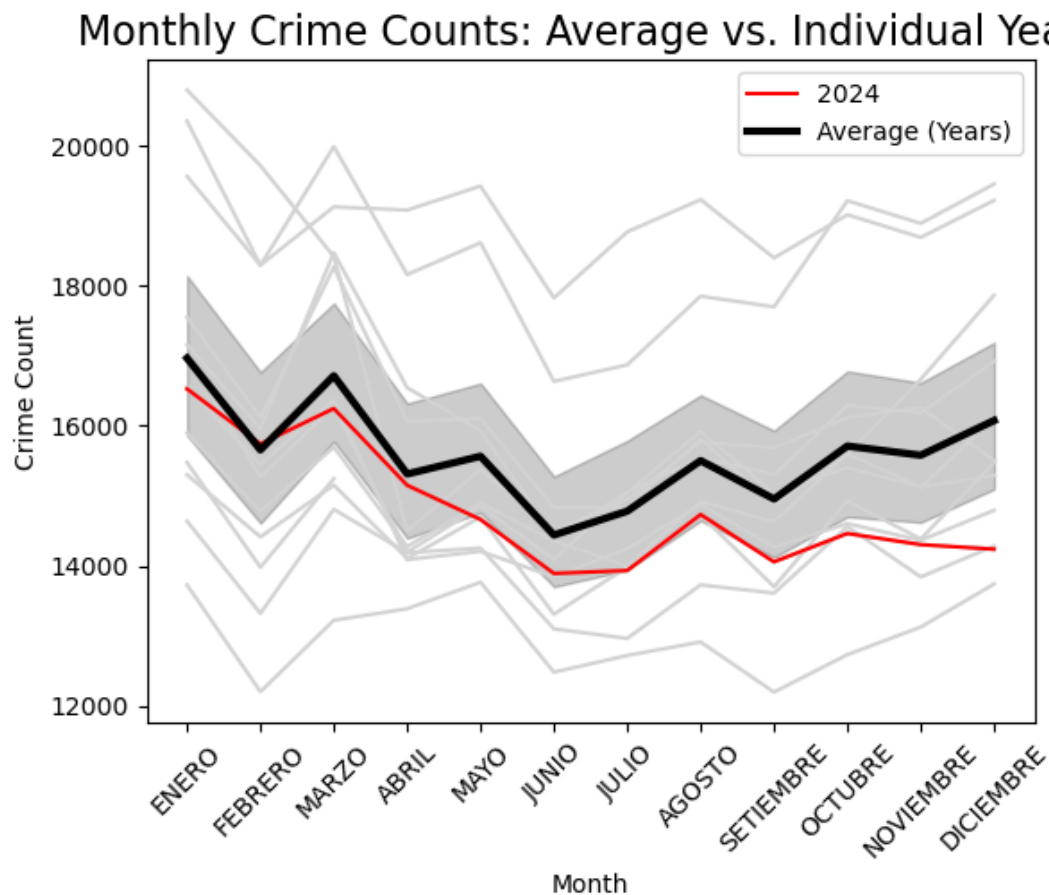
## 1.5 Summer, where the most crimes are committed

On the following graph we can see that most of the crimes, on average, occur between January and March each year.

Then tend to decrease and re increase on the summer like months.

One would have thought that crimes tend to occur more on the winter nights than on summer.

We can also see that 2024 is below the average for each month except February, this is a good sign for the future.



Looking into our results, we can say and get to understand that most of the assaults and other crimes are committed during summer times with a gradual increase over the years for Domestic Violence.

## 1.6 Neighborhoods and crime report impact over the years

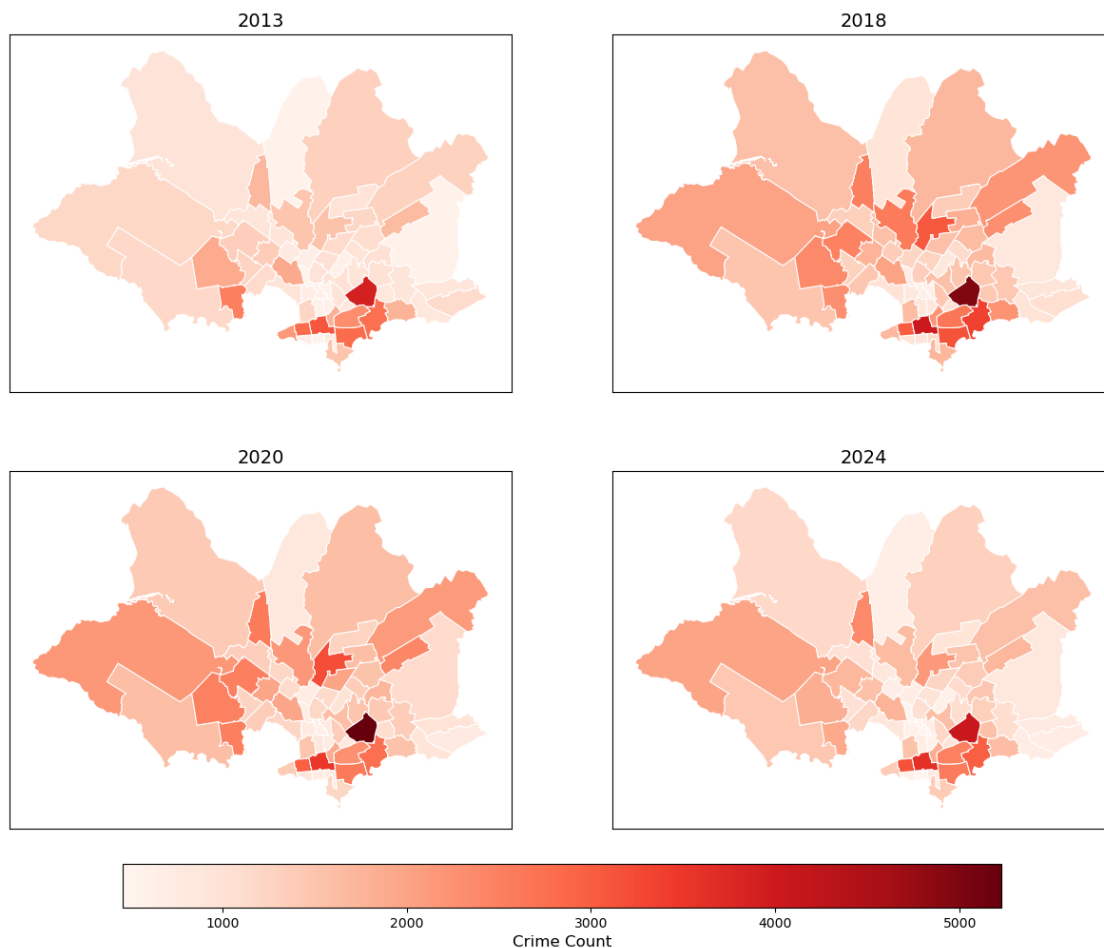
We want to understand what happened with the top 5 neighborhoods on Montevideo with the most reports and last 5 ones.

On 2024, will they be better or worse?

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.



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 reported 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 committed 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*

### 1.6.1 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

### 1.6.2 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

## 1.7 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 phenomenon.

Since 2018 peak where theft and mugging (Hurto y rapiña) got it's maximum, there is a decrease 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 taken more into perspective.

It's notable to see that most of the crimes occur 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.

## 2 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 retrieve the next information:

- Year, Month, Time, Department
- Weapon classifications (Fire, Hand, White, etc)
- Minors involved (Did minors participate on the homicide?)
- Relationship (What the relationship between the victim and aggressor 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 committed 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"
```