

Final Project

Project overview

Motivated by the growing crime incidence in Mexico City (CDMX) which, according to INEGI's¹ 2019 National Survey of Victimization and Perception on Public Safety was of 69,716² crimes per 100,000 inhabitants, this project aims to provide the user information on the number of crimes that happened at an specified place, day of the week, and hour, with the purpose of the user potentially taking certain precautions when going to a specified area given that time and day of the week.

To provide a broader context, the application provides two maps:

- A map of the precinct where the location point belongs, that includes the points where previous crimes were committed on the day and time frame specified by the user. Additionally, it shows the nearest Police Station relative the location provided.
- A map of CDMX divided by precincts to compare the total crimes committed in each precinct at the day and time frame specified by the users. (Darker colors means more crimes)

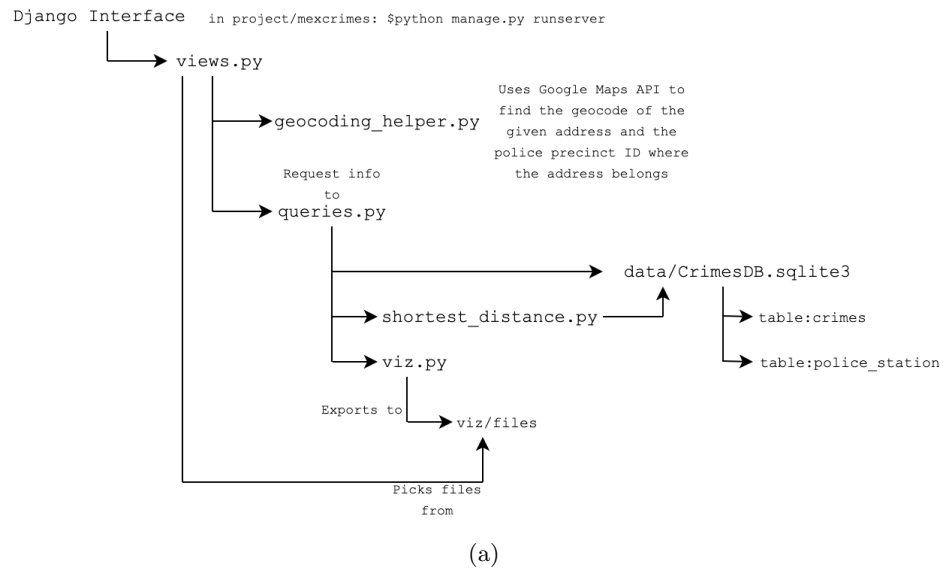
And two bar graphs showing the total number of crimes committed at the precinct of interest:

- Every day of the week.
- Every hour on the specified day of the week.

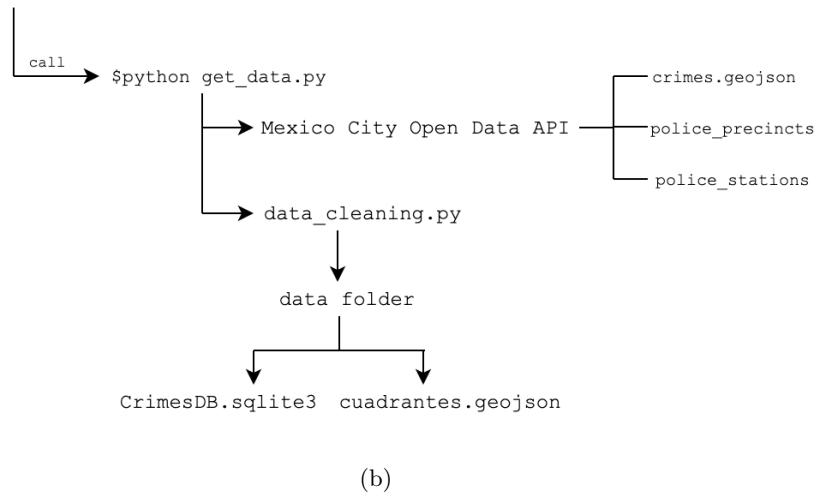
¹Mexico's National Institute of Statistics and Geography

²Almost half of that number (31,045) represent Robbery to street passerby or in public transport.

Overall Software Structure



How the data is built?



a)

- Django interface → Calls the module `views.py`
- `views.py` → Returns the rendered site with the output. Calls the modules `geocoding_helper.py` and `queries.py` and the visualizations stored in the `viz` folder.
- `geocoding_helper.py` → Connects to Google Maps API and returns the number of precinct that the input location belongs to.
- `queries.py` → Performs the required queries of number of crimes on the crimes SQL database. Also, calls the modules `shortest_distance.py` and `viz.py`
- `shortest_distance.py` → includes a function that calculates the distance of the input location (in km.) to all police stations in CDMX and returns the closest one.
- `viz.py` → Produces all four visualizations (2 maps and 2 bar graphs)

b)

`get_data.py` → Connects to Mexico City's Open Data API and obtains crime data from 2018 and 2019, as well as the police precincts delimitation and police stations locations. Calls the module `data_cleaning.py`, and stores the clean databases on the data folder

- `data_cleaning.py` → Cleans the crimes database filtering by crimes that could affect the user depending on the way they travel.

Project Accomplishments

Our main goal was to generate a tool that allows the user to see the crimes that took place at a certain place, time, and day, and get an idea of how risky is that zone. We achieved showing the relevant expected visualizations (all mentioned in Project overview) and also show the nearest police station³ to the location provided (we noticed there's a small number). Nevertheless, we weren't able to normalize the crime number in order to make the different precincts correctly comparable.

For example, touristic areas are usually crowded on the weekends and therefore it's highly likely that more crimes could be committed in that precinct, therefore, comparing such precinct to a less-crowded one, would not be a correct comparison. This was mainly due to the lack of data on the number of people in a given precinct. While an absolute crime number comparison is still informative on how risky is a precinct in CDMX, crimes committed per X number of inhabitants in a given precinct would be better.

Some interesting locations to try

- Plaza de la Constitucion, Centro, Ciudad de Mexico (CDMX's main square, highly concurred) Any time frame.
- Plan de Barrancas Mexico between 0 and 4 AM (no crimes reported)
- Hyde Park, Chicago (outside CDMX)
- Insurgentes Sur 339 (Check the spike on Thursdays at 7PM. Usually when people get out of work on Thursdays they go to dinner with coworkers)

Other locations :

- Coscomate 91, Toriello Guerra
- Condor 357, Las Aguilas
- Rio Hondo 1, Altavista
- Camino de Santa Teresa 930, Heroes de Padierna

³The term police station is used as equivalent to "Ministerio Publico", which is the administrative office where people go to report crimes in CDMX