**Food Inspection Cost Optimization**

**Problem brief:**

The City of Chicago has developed a model to optimize restaurants health inspections, which led to detecting critical violations 7 days earlier than business-as-usual inspections. Having similar case at research, we want to reproduce the same work done (or similar) by the city of Chicago using the most current data provided by their public data portal.

However, for our case, we expect the work submitted to *solve an optimization problem* with the goal of maximizing identified violations amounts, while minimizing operational cost.

**Operational cost = visit cost \* number of visits**

The work submitted should discuss all considerations, constraints, and objectives taken while designing the model and the optimization problem.

***Main objective of the problem* is to maximize revenue while minimizing operational cost**

More details about the problem can be found here: <https://chicago.github.io/food-inspections-evaluation/>

**Data:**

* Data used in the study is publicly available by City of Chicago here: <https://data.cityofchicago.org/>
* Violation fees based on risk (Risk column means violation severity):
  + Low = $200
  + Medium = $400
  + High = $600

**Assumptions:**

* The number of inspectors is: 12
* The visit cost: $300

*Notes:*

* *The study used data related to the “****inspectors”*** *which is not publicly available.*
* *Weather data can be retrieved through any public API.*
* *Focus is only on “Canvass” inspections*

**Deliverables:**

All work must be done using python and delivered through Jupyter notebooks that include:

* Basic EDA
* Predict the risk of a restaurant committing violation.
* Solve an optimization problem that aims to maximize revenue while minimizing operation cost. This should discuss all decisions taken for this activity
* Optional: Performing spatial analysis