**Musa Practicum scope of work: Developing a Fire Response Readiness API - FRRAPI**

The Philadelphia Fire Department responds to hundreds or even thousands of locations everyday to quell an array of emergencies. Currently, they have no ‘situational awareness’ of fire risk for a given location when an emergency call comes in. We are going to help them create such a tool, by providing these two deliverables:

Task 1 - A parcel-level (building) fire risk score prediction for each property in the City.

Task 2 - A new API dependent on the cities existing open datasets that can provide situational awareness on risk for each property Citywide.

We are going to consider fire risk by gathering parcel level data (indexed by the ‘OPA\_Account’ number) on fires, code violations, 311, and OPA assessments (zoning, size, etc.) to create an API that can retrieve relevant data given an address query.

**Project Management –** The API tasks are going to require two team members who took the Cloud-based course this fall. Designate these two with the third team member focusing initially on the fire data/model.

**Data wrangling -** Work with the open data APIs for violations, 311 and OPA – learning to develop API calls that can cross-reference these datasets and ultimately, wrangle together those variables that can give an ‘operational picture’ of risk for a given property.

Then, work with the fires dataset we have provided for you. Reconcile (join) these data to the above datasets by the OPA\_Account.

**Exploratory Analysis -** Task 1: Develop maps and cross tabulations of building fires by neighborhood, property type, property age, violations, 311 etc. Explore binary correlations between building fires and these features.

Task 2: Create some API routines that can pull across these datasets showing risk features for a given property AND for nearby properties.

**Modeling and Validation -** Predict building fires as a function of your features for each building. This is a binary outcome and should be validated as such. Note that there will be way more no fires (0’s) than fires (1’s), so you will have to rebalance your data accordingly. How generalizable is your model by building type, age, neighborhood etc.?

**Your app -** The focus should be on creating an API that can bring together your risk score and other datasets by property to increase the situational awareness for the Fire Department. Building this API with documentation is sufficient. If there is additional time, you can consider a dashboard.