**Risk Analysis of Crime Hotspots Zones in New York City Using Python by Kalu Okigwe**

**Introduction**

Crime hotspots are a critical concern for urban areas like New York City (NYC). Understanding the spatial distribution of crime allows for better allocation of resources and more effective crime prevention strategies.

**Aims and Objectives** This proposal aims to leverage Python’s geospatial libraries to analyze historical crime data and produce a spatial map of NYC that identifies high, moderate, and low crime risk zones. The results will help urban planners, law enforcement, and policy makers understand where crime is most concentrated and the factors contributing to these patterns.

**Data**

This research will use publicly available data sources, including NYC Open Data Portal: Historical crime records across NYC's five boroughs. US Census Bureau: Demographic and socio-economic data for neighborhood analysis. Key attributes will include crime type, geographic coordinates, date and time of occurrence, and population demographics. NYC Department of Transportation: Data on transportation infrastructure (e.g., subway stations, bus routes).

**Methodology**

Data Preprocessing: Cleaning the data, geocoding crime incidents, and categorizing crime types. Spatial Analysis: Using Python libraries like `geopandas`, `folium`, and `scikit-learn`, kernel density estimation (KDE) will be applied to identify high-density crime areas. **Risk Categorization: Zones will be classified as high, moderate, or low crime risk zones based on crime density**. **Visualization**: Python’s `matplotlib` and `folium` will be used to create an interactive map, color-coded to represent risk zones **(red for high, yellow for moderate, and green for low).**

**Analysis and Expected Outcomes**. The spatial map will show the crime risk distribution across NYC. Further analysis will investigate correlations between crime rates and factors like population density, income levels, and proximity to public transportation. This will provide actionable insights for crime prevention strategies and urban planning.

**Conclusion**

This research will use Python to develop a spatial risk map, offering valuable insights into crime patterns in NYC. The findings will help inform targeted crime prevention efforts and resource allocation strategies.