**PROJECT TITLE:** Exploring Trends in Crime Data in Birmingham between Aug 2020 – Jul 2023

**TEAM MEMBERS:** Darryl Hewitt, Kaj Kaliban, Suwaida Idris, Mushfiqur Rahman

**DESCRIPTION/OUTLINE:**

Examine how different crimes e.g. theft/assault/drug vary throughout the year and determine seasonal patterns in crime types. Focus will be time-series analysis, seasonal decomposition and data visualisation

For Birmingham crime data:

* Determine spatial distribution
* Determine categories
* Determine seasonal variations
* Determine spatial distribution of indicators of deprivation and explore correlation with crime

**RESEARCH QUESTIONS:**

1. Are there seasonal patterns in different types of crimes in Birmingham? [Temporal]
2. Are there trends in deprived vs non-deprived areas in Birmingham? [Socioeconomic]
3. Are there any spatial correlations between crime rates and police station locations in Birmingham? [Geographic]
4. Are there any trends in crime vs demographic factors? [Demographic]

**DATASETS:**

1. <https://data.police.uk/>
2. <https://www.ons.gov.uk/>
3. Census data
4. <https://www.geoapify.com/>

**BREAKDOWN OF TASKS:**

* Collect data (csv format)
* Read into dataframes for an initial look at the data and clean up
* Consider crime data and filter a set of study areas (by types of crime or other suitable factors)
* Plot summary data on a map of Birmingham using Lat/Lon points
* Consider statistical summaries of each month to see if there are seasonal variations by plotting crime rates per month
* Consider statistical summaries for deprived vs non-deprived areas in Birmingham and plot this against crime data
* Consider statistical summaries of crime rates compared with proximity to a police stations and plot these on a graph.
* Consider key demographic factors (such as population density) and levels of crime to plot on a graph

Exploratory Data Analysis

For the period AUGUST 2020 TO JULY 2023 in Birmingham:

Summary data:

What are the street crime types? (Bar Chart/Pie Chart)  
Research Question 1:

What is crime count vs IMD score correlation?  
What is crime type count vs IMD score correlation? (Plot all, and then select 2 for the ppt) (logarithmic)

Research Question 2:

Where are the top 10 crime count locations and what are their IMD Scores?  
Where are the least 10 crime count locations and what are their IMD scores?

Research Question 3:

Crime rates exhibit seasonal with lower street crime rates in Winter relative to others  
Winter months: Oct-Mar vs Summer: Apr-Sept (logarithmic)

Research Question 4:

Where are the police stations located in Birmingham (geoapify, places, API).   
How far is the nearest police station from the highest crime count location?  
Heatmap of Crime counts with police stations

TASKS OUTSTANDING:

1. GEOAPIFY (Class today)
2. PowerPoint: KAJ
3. README: SUWAIBA
4. Markdown on the Jupyter Notebook: DARRYL

PRESENTATION: (1. POWERPOINT) 10 MINUTES FOLLOWED BY QUESTIONS

1. INTRODUCTION: Contextualise – street crime data, 36 months, LSOA (CENSUS)/sources of data, research questions? DARRYL
2. JUPYTER NOTEBOOK WALKTHRU (Data clean/outputs) MUSHFIQ
3. SUMMARY: KAJ
4. RQ1: MUSHFIQ
5. RQ2: SUWAIBA
6. RQ3: KAJ
7. RQ4: DARRYL
8. CONCLUSION/FURTHER WORK: SUWAIBA