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

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**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. <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)

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

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?