

## **How to run the program:**

The entire code for the program has been written using python 3.9.6. The codes have been broken into modules namely:

- **APK:** This module creates a GUI and likewise interacts with other modules to produce the charts.
- **API\_Module:** This module extracts Stop & Search data via API.
- **Data Cleaning module:** Cleans the datasets and extracts additional features from the datasets
- **Visualization module:** This module contains functions that generate visual charts from the dataset.

**The entire program runs fully from the APK module.**

To run the entire program, run the APK module either from the command prompt terminal (by double clicking the APK module) or from the python terminal. The charts will Open in a new window, close each figure to generate the next figure. ***NOTE THAT IT MIGHT TAKE A WHILE BEFORE CHARTS GET DISPLAYED.***

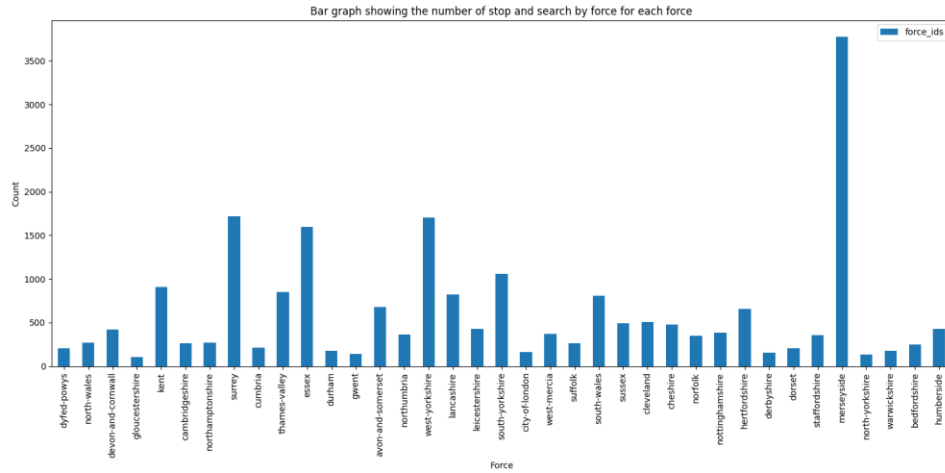
## **Dependency Information:**

The dependency library used are: pandas, matplotlib, seaborn and pywaffle. These libraries can be installed on your local system by using the pip command in the command prompt terminal

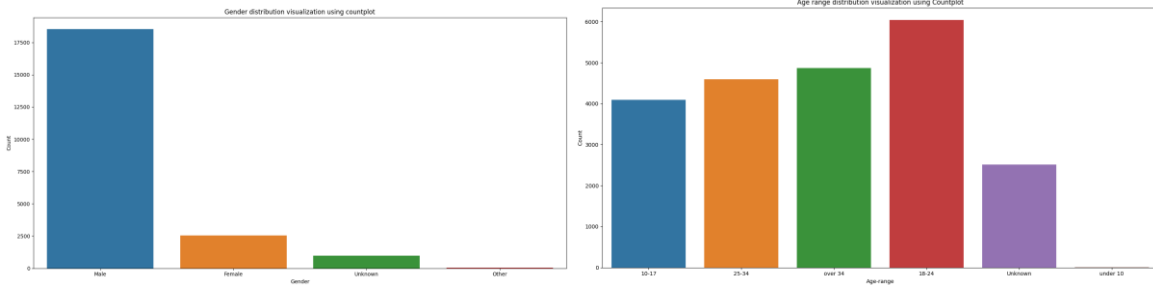
## **How to run the unit tests:**

The Jupyter Notebook in the root directory of the Source folder contains the unit testing codes for the Visualization functions.

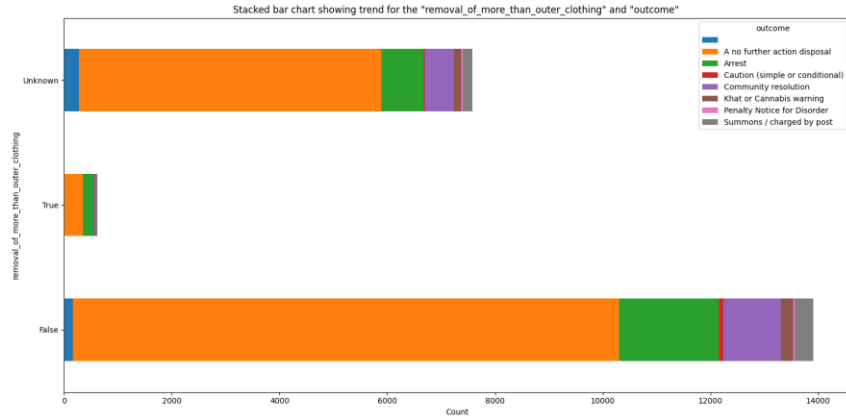
1. Bar graph showing the number of stop and search conducted by each force unit:



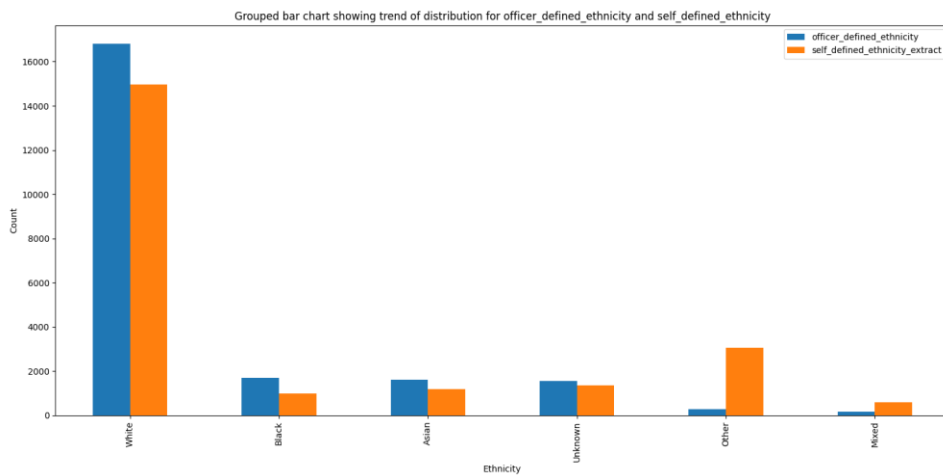
- Count plots showing Gender distribution and age distribution across the dataset.
  - X-axis: Gender/Age-distribution
  - Y-axis: Number of searches conducted on them
  - Description: The gender count plot shows that males were most searched while the age count plot shows that people of ages 18-24 were most searched.



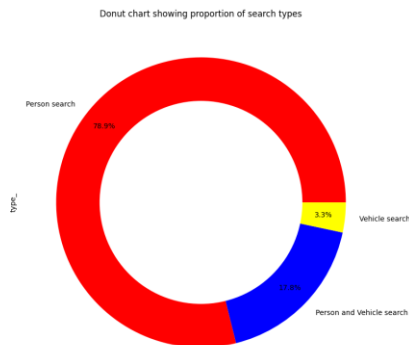
- Stacked bar graphs showing the relationship that exists between searched people who had “more than an outer clothing removed” and “outcome”:



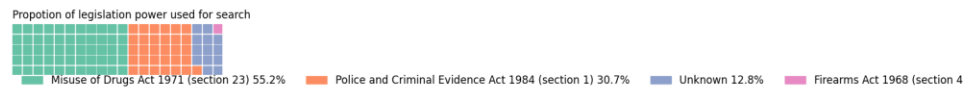
4. The grouped bar chart below shows the proportion of ethnicity of searched people has stated by the “person searched [self-defined ethnicity]” and “officer who searched [officer-defined ethnicity]”.



- A donut chart showing proportion of search types [Whether this was a 'Person search', a 'Vehicle search', or a 'Person and Vehicle search'], the chart shows that most search was a person search.



- The waffle plot shows the top-most used legislation power used in carrying out stop and search.



- The bar graph below gives information about the number of searches conducted in each hour of the day.

