**Assignment Overview**

This Python program is designed to read GROW sensor locations from the provided dataset, clean the data by addressing errors, and accurately plot the corrected sensor locations on a UK map. The dataset, named "Growlocations.csv," is located at "E:\Dundee\_2023\First\_Semester\ProgrammingLanguageForDataEngineering\Python\07-Assignment\SecondAssignment\Growlocations.csv." The map image, provided as "map7.png," serves as the geographical canvas for plotting the sensor locations. The assignment encompasses key aspects of data reading, data cleaning, and precise data plotting on the map.

**Code Overview**

The Python program adheres to best practices for readability and modularity, structured into the following sections:

**1. Importing Required Libraries**

Essential libraries, including pandas for data manipulation, matplotlib for plotting, and PIL for image processing, are imported at the beginning of the code.

**2. Loading the Grow Dataset**

The program loads the "Growlocations.csv" dataset into a Pandas DataFrame for subsequent analysis. The dataset is sourced from the path "E:\Dundee\_2023\First\_Semester\ProgrammingLanguageForDataEngineering\Python\07-Assignment\SecondAssignment\Growlocations.csv."

**3. Data Cleaning**

This section of the code ensures data cleanliness by addressing potential column swaps and filtering out rows with latitude and longitude values outside the specified geographical boundaries for the UK map.

**4. Plotting on the UK Map**

The code iterates through each corrected sensor location, converts its latitude and longitude to pixel coordinates, ensures the points lie within the image boundaries, and then draws blue ellipses on the UK map image to visually represent the sensor locations.

**5. Result Presentation**

This section marks the conclusion of result presentation. It involves creating a subplot, loading and displaying the UK map image, plotting the corrected GROW sensor locations as blue points, setting labels and a title for the plot, adding a legend, and displaying the final result.

The source, including the dataset and image, has been loaded into my GitHub account. The respective addresses are as follows:

<https://github.com/AhmadZiaBahrami/PythonSecondAssignment1.git>

Source Code: GrowLocationsBahrami.py

Dataset: Growlocations.csv

Map Image: map7.png

Executing this code will generate the image below. The resulting image illustrates the plotted GROW sensor locations on the UK map, providing a visual representation of the corrected data.

