*Site Location Problem*

**https://github.com/amyseoj1/GEOG5995M\_CW2\_Resit**

**Problem Statement**

The goal of this project is to combine maps of the UK that represent different information important to the a factory that makes rock aggregate. The maps need to be displaced in GUI to allow the company to play with.

**Data**

There were three raster map files provided. Each map has a shading intensity which represents the best areas on the basis of different factors.

|  |  |  |
| --- | --- | --- |
| **Map** | **Size** | **Range** |
| Geology.txt | 530\*335 | (0,255) |
| Transportation.txt | 530\*335 | (0, 127) |
| Population.txt | 530\*335 | (0, 255) |

**Method**

**Chart

Description automatically generated**

Steps

1. Import the maps of the UK.

2. Rescale the raster values to 0 to 255 range.

3. Merge the maps.

4. Rescale the merged map to 0 to 255 range.

5. Display the map.

6. Output the merged map raster in CSV.

**Model Structure**

The model is easy to follow. It creates a GUI class and have functions to create maps and save maps inside. Users will be asked to turn on or off the maps using the scroll bars, and display and save the merged map.

**Output**

After all of the three input files are downloaded, the raster data was read line by line and appended to construct the array. The first task was to rescale the raster values to fit 0 to 255 range. Linear scaling method was implemented. In order to do so, minimum and maximum values of each maps were identified. Taking the ratio of maximum to 255, each value was multiplied by this ratio. After that, the maps were visualized to check.

**Graphical user interface

Description automatically generated**

The major task of this project was to create the application in GUI. This took the majority of development time. Three scroll bars were created to turn on and off the maps. Here, 0 means turn off the map and 1 means turn on the map. If you turn up the scrollbars for geology and population and turn down the one for transport, the first two maps will be combined and the shading on the map will be 50 percent due to each. The output window looks like the figure below.

**Graphical user interface

Description automatically generated**

If users are satisfied with the merged map, they can save the map in csv format.

**Issues during development**

The major challenges of this project had to do with creating fully functioning GUI. Developing the interactive scroll bars and buttons to produce the desired output was most challenging. About half of the development time was spent on updating the scroll bar values and refreshing the map. The problem was solved by a similar thread posted on an online forum.

**Sources**

Materials of this course provided the foundation of the current model. Understanding of object oriented modeling and GUI modeling was required. Discussions with Andy Turner helped tackling this project.