Final Exam

Geospatial data analysis in R
KDI School Fall 2024

2024-11-29

Due date: Thursday, December 5th at 11:59pm

Please work by yourself. As before, please submit the following files on eKDIS:

- Your R Markdown file
- Your knitted PDF file
- Any other scripts you used to complete the assignment

I would like all of your answers to be in a single markdown file. However, you are welcome to use another script for any of the analyses, if you would prefer. If you do, please include the script in your submission.

1 Files

Here is the list of files in the folder:

- `gambiarastershapefile.shp`: This is a shapefile of a grid of Gambia. Each grid is made up of hexagons that are 0.025 degrees from edge to edge.
- `gambiaroads.shp`: This is a shapefile of primary roads throughout the country.
- `gmbpop.tif`: This is a raster of population in Gambia.
- `households.csv`: This has the location of a random sample of households.
- `prices.csv`: This has the prices of maize at different markets throughout the country.

2 Tasks

1. First, create a map – a single map – with:

- The grid of Gambia
- The roads
- The location of households

2. Next, please extract the population values from the raster to the grid. Please create a map of grid cells with fill colors based on the population values.
3. Now, please find the distance from each household to the nearest road. Create a histogram of these distances.
4. Load the price data.

- Create Voronoi polygons for the markets throughout the country.
- Create a map of the Voronoi polygons with the *household* locations (not market locations).

5. The final task is the toughest.

- We want to create a raster for maize prices in the country.
- Please use inverse distance weighting to create a raster. Create a (square) raster with a resolution of 0.025 degrees.
- Plot this final raster with a color scale of your choice.
- Find the average maize price in each polygon (from `gambiarastershapefile.shp`) using the raster you created. Create a map of these average prices.