**Assignment 5 Part 1: Spatial Data Analysis in R**

**Step 1: Mapping species richness at different resolutions**

Chart

Description automatically generated

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Description automatically generated with medium confidence

Chart

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Chart

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Chart

Description automatically generated

I have observed that with increase in resolution, the species and the observations could be clearly visible and identified. However, in order to display all the species and observations the resolution should be low but in order to display few observations clearly high resolution is encouraged to use.

**Step 2: Mapping Shannon Diversity**

Graphical user interface, text, application

Description automatically generated

Chart

Description automatically generated

I was not able to plot Shannon distribution correctly. I found the Shannon distribution of entire data and species. I had found the Shannon diversity which is 4.396. I am working on ways to find out proper solution for part2.

Graphical user interface, text, application

Description automatically generated

**Assignment 5 Part 2: Mapping in Tableau**

I have selected a dataset from Kaggle which contains the information regarding state wise and county wise population of United States. The dataset has features such as “State”, “County”, “Total Population”, “Female Population”, “Male Population”, “Percentage of Female Population”, “Percentage of Male Population”, “Median Age”, “Latitude” and “Longitude”. The data is completely focused on the population metrics across the states and counties in the united states.

I have created dot maps and choropleth map using the dataset.

Choropleth Map: Choropleth Maps are the thematic maps which are used to represent statistical data using various shading patterns or predetermined geographical areas. The choropleth maps are best used to represent variability of particular measurement across a region.

Map

Description automatically generated

The choropleth map above represents the county wise total population across united states. The color coding has been done based on the county. Red-Green-Gold Diverging has been selected to differentiate the counties based on the population numbers. I have selected red-green-gold diverging because, the colors are quite contrast and can easily be separated. Also, they don’t confuse people with color blindness. The red color represents the least populous counties, the gold color represents the medium populous counties, and the green color represents the highly populous counties.

Map

Description automatically generated

The above map is choropleth map, and it represents the median age across the states in United States. The color coding has been done on the basis of median age. Blue-Teal color coding has been selected to represent the median age of the population in different states. The lite blue color represents the states with least median age and the dark blue color represents the states with high median age. The blue-teal color coding has been selected to differentiate between the states with high and least median age population.

Dot Map: Dot maps represent the geographical density distribution of a phenomenon using dots in the map. The dots determine the quantity of the phenomenon.

The below map is a dot map which determines the state-wise percentage of female population across united states. I have used green-blue diverging color coding to differentiate between high and least female populous states. The color coding was done based on female population percentage. The blue dots represent the state with high percentage of female population and the green dots represents the states with least percentage of female population. The green-blue diverging color has been selected as both the colors are quite contrast and doesn’t confuse each people with color blindness.

Map

Description automatically generated

The map below is a dot map that represents the state-wise male population across united states. The color coding has been done based on the amount of male population. The blue color dots have been selected to represent the male population in each state. The dark blue dots represent the states with high male population and the light blue color dots represents the states with least male population. The different shaded of blue color can easily identify the states with different ranges of male population. The blue color is bright, eyepatch and easily recognizable, hence it was chosen to represent the dots.