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ECS 163 Homework 5 Writeup

Visualization:

I visualized the data using a bubble chart and a horizontal bar chart. I wanted to compare the total population size of each region so I used a bubble chart to display the size difference between the regions. I wanted to show the GDP for the countries in the same region so I used a bar chart to display the bar length (GDP) for each country in the selected region.

Marks and Channels:

For the bubble chart, I used circles and texts as my marks. I used the GDP of each region to determine the size of the circles. I used a square root scale to scale the GDP of each region so all the circles would fit into the left half of the screen. I used a threshold scale with a purple color scheme to color the circle so regions with a similar amount of population size will have the same color. This means that the bubble chart uses the purple hue with different saturations. Since I didn't know how to position each circle in the chart, I used a force simulation to position the circles. This means that the position of each circle have no meaning. I put a title on top of the bubble chart to show the type of information the chart displays. On the right side of the bubble chart, I put a vertical legend to serve as a scale for the population size which used the same threshold color scale as the circle's color. I couldn't get the legend's label to display "4B" instead of "4G" because the format ".0s" doesn't have a "B" unit. Each circle shows information through a tooltip with the region's name and the total population when the user hovers over it. I will elaborate on this in the "interaction" section.

For the horizontal bar chart, I used rectangles and texts as my marks. I opted for a horizontal orientation because I can show more data than a vertical orientation with my current width and height. I used a quantize scale with a green color scheme to color the rectangles so countries with a similar GDP will have the same color. I used a quantize scale instead of a threshold scale because I only have two data, i.e. 0 and max GDP, rather than a list of data to set as the domain

and I need it to work with the green color scheme. This means that the bar chart uses the green hue with different saturations. The bar length is calculated based on the GDP amount scaled with the x-axis of the chart. Since the bar chart have a limited amount of space, I decided to only show the top 10 countries with the highest GDP in each region. However, some regions have less than 10 countries so I show all the countries for that particular region. The bar chart title changes dynamically based on the name of the region and the number of countries shown with the number of countries being capped at 10. I positioned the bars so that countries with the highest GDP is on the top and the lowest of the 10 is on the bottom. In the bar chart, the x-axis represents the GDP and there's no y-axis since some country's name is too long to fit normally using the band scale of the y-axis. Therefore, I labeled each bar using its corresponding country name and GDP to make it easier to read the information for each bar. The label changes color from black to white so lighter colored bar have black text while darker colored bar have white text. The y-axis also changes based on the maximum GDP of a region. Unlike the bubble chart, I displayed the information all at once in the bar chart because it doesn't look clumped up, and it doesn't require the user to do any work in order to see the GDP data.

Interactions:

For the bubble chart, I used a tooltip to display the region's name and total population size when the user hovers above the circle. I chose this interaction because it makes the chart look cleaner than displaying information on top of the circles all at once. When the user clicks on one of the circles, the opacity of the other circles will be reduced to 0.2 while the opacity of the clicked circle remains the same at 1. This serves as a feedback to show the user that their click is registered. When the user click on another circle while in clicked mode, all the circles' opacity will go back to 1 to serve as a feedback letting the user know that no circles are clicked at the moment. I put a stroke of 1 pixel around each circle so the opacity change would work with less saturated colored circles, meaning the clicked circle with less saturated color wouldn't look the same as the other circles. When the user move the mouse away from the circle, the tooltip disappears to show the user than they can no longer click on the circle. However, if there's a

clicked circle, then I show the tooltip as long as the user doesn't unclick the circle because I want the user to be able to see the information without having to hover over the circle after clicking.

For the horizontal bar chart, I did not add any interaction to it because I'm already displaying each country's name and GDP as a label for each bar so I didn't have any other relevant information to show. The bar chart redraws itself every time the user clicks on one of the circles in the bubble chart. However, if the user clicks on the same bubble chart twice, then I don't need to redraw because the bar chart already have the correct information. This reduces the amount of unnecessary redrawing of the chart.

Color:

For the bubble chart, I used a purple hue with different saturations to color the circles. I decided to use color saturation because it allows me to use it as a scale for population size for each region. I picked the color purple because it stands out the most without being too harsh on the eyes like orange and yellow.

For the horizontal bar chart, I used a green hue with different saturations to color the bars. I decided to use saturation because it allows me to use it as a scale for GDP amount for each country in the observed region. I picked the color green because it symbolizes money so it's the best choice to use in a GDP chart.