Homework 4

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2021-03-27

```
.chunkcolor {
background-color: MistyRose;
}
```

```
chinaprojects<- read_csv("Source_Data.csv") %>%
    rename(year = transactions_start_year)  %>%
    dplyr::select(project_id, project_title, recipients, recipients_iso3, ad_sector_codes, ad_sector_nar
          mutate(hover = paste0(recipients, "\n$", total_commitments))
options(scipen = 999)
```

World Map

I chose this world map visualization to showcase China's financing to countries abroad between 2000-2014. A map is an engaging visualization tool to show data that happens across different locations and time, while also adding depth and simplicity. I used the plotly package to perform this task since it felt the most intuitive for creating interactive graphics and didn't require the need to connect to an external api such as Google or Openstreemap.

I wish I was able to customize the visualizations of the map more. I wanted to create a darker map background however most of the documentation and themes for plotly was within Python. Lastly since plotly produces an HTML I wasn't able to produce a .png of the graph despite using orcas.

```
worldmap <- plot_geo(chinaprojects,
                locationmode = 'ISO-3',
                frame = ~year) %>%
  add_trace(locations = ~recipients_iso3,
            z = ~total_commitments,
            color = ~total_commitments, colorscale = 'Viridis',
            text = ~hover,
            hoverinfo = 'text') %>%
  colorbar(title = "Total Spending (USD)", tickprefix = '$') %>%
  layout(title = "Chinese Financing Abroad\n2000 - 2014") %>%
  config(displayModeBar = TRUE)
worldmap
```

Choropleth

I chose to dig deeper into visualizing maps by making a choropleth map of African countries that received financing from China. A choropleth is a great way to visualize how variables vary across a geographic region since it essentially functions as a "heat map".

I had difficulty with adjusting the color spectrum in order to make it more visually distinct. I also had trouble with shortening the legend labels and also giving them a prefix of "$" like I did with plotly above.

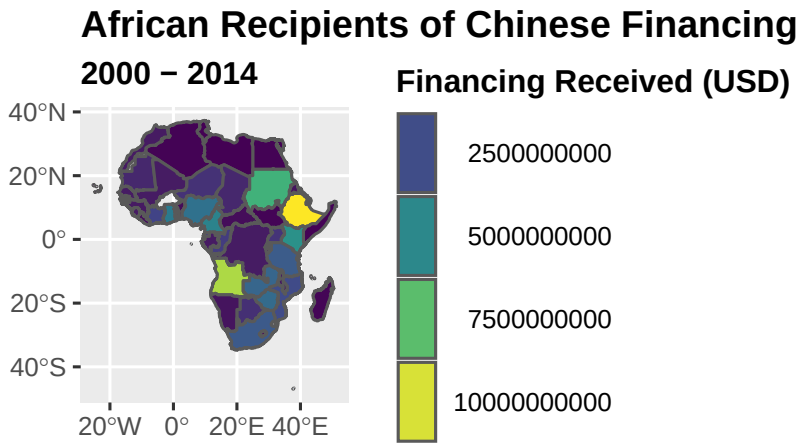
```
countrytotal<- chinaprojects %>%
  group_by(recipients_iso3) %>%
  summarise(AmountReceived = sum(total_commitments, na.rm=TRUE))

africa <- st_read("africa.geo.json") %>%
  rename(recipients_iso3 = iso_a3)
```

```
## Reading layer `africa.geo' from data source `C:\Users\W\Documents\R projects\DACSS-601\africa.geo.js
## Simple feature collection with 54 features and 66 fields
## Geometry type: MULTIPOLYGON
## Dimension:     XY
## Bounding box:  xmin: -25.36042 ymin: -46.96575 xmax: 51.41704 ymax: 37.3452
## Geodetic CRS:  WGS 84
```

```
map_and_data <- inner_join(africa, countrytotal, by="recipients_iso3")

ggplot(map_and_data) +
  geom_sf(aes(fill=AmountReceived)) +
  scale_fill_viridis_c(name= 'Financing Received (USD)',
                       guide=guide_legend(
                       legend.position = 'right',
                        label.hjust = 1,
                        keywidth = 1,
                        keyheight = 2
                       )) +
  labs(title = "African Recipients of Chinese Financing",
       subtitle = "2000 - 2014") +
    theme(title = element_text(face = 'bold'))
```

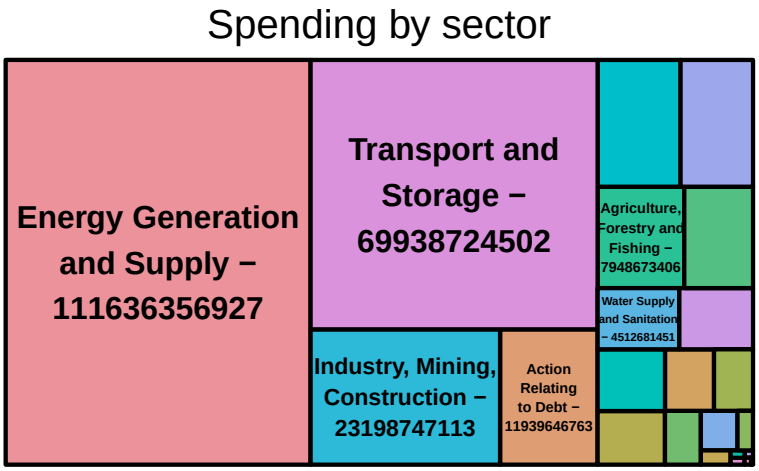


Treemap

Here I used a Treemap to visualize spending by sector since it is a great way to organize proportions of categorical data when you have large datasets in comparison to a pie-chart.

However, I had a difficult time with changing certain parameters such as forcing my text to fit into boxes (abbreviate wasn't working for me) and changing the color scheme to where it didn't duplicate colors. Also when I knit to a PDF the treemap changes its structures and doesn't display some sectors.

```
chinaprojects %>%
  group_by(ad_sector_names) %>%
  summarise(sumtotal = sum(total_commitments, na.rm=TRUE)) %>%
  mutate(adtotal = paste(ad_sector_names,sumtotal, sep = " - ")) %>%
  treemap(
    index = "adtotal",
    vSize = "sumtotal",
    type = "index",
    title = "Spending by sector")
```



Sources

Original publication
    Pre-merged data