Group assignment of Week5

group 6: Finn Womack, Lorne Curran, Martin Leandro Uranga Priore, Chenyang Duo, Emerson Webb, Jiarui Xu

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```
knitr::opts_chunk$set(echo = TRUE, warning = FALSE, message = FALSE,
                      fig.show = "hold")
library(tidyverse)
library(ggrepel)
rm(list = ls())
```

Plot1

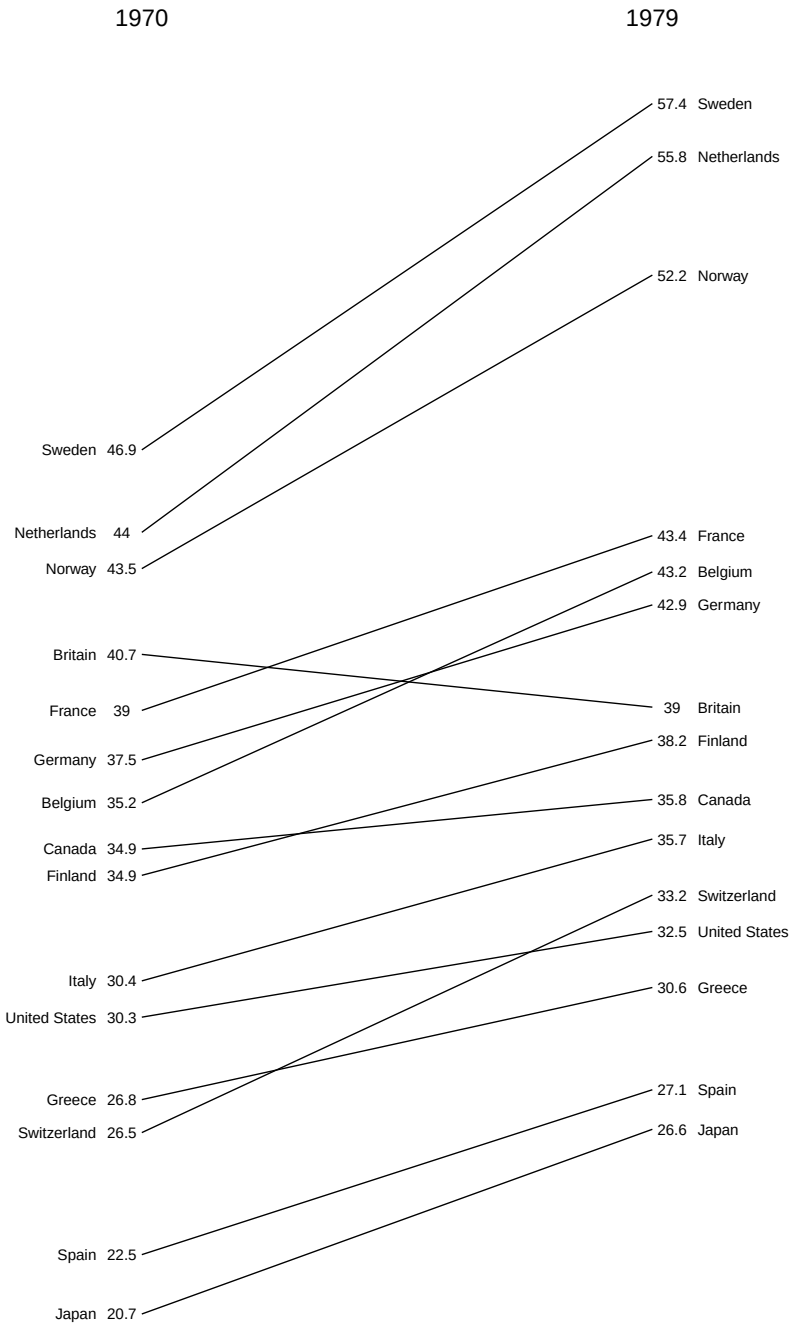
```
tax <- tribble(
  ~ Country,      ~ `1970`, ~ `1979`,
  "Sweden",          46.9,     57.4,
  "Netherlands",     44.0,     55.8,
  "Norway",          43.5,     52.2,
  "Britain",         40.7,     39.0,
  "France",          39.0,     43.4,
  "Germany",         37.5,     42.9,
  "Belgium",         35.2,     43.2,
  "Canada",          34.9,     35.8,
  "Finland",         34.9,     38.2,
  "Italy",           30.4,     35.7,
  "United States",   30.3,     32.5,
  "Greece",          26.8,     30.6,
  "Switzerland",     26.5,     33.2,
  "Spain",           22.5,     27.1,
  "Japan",           20.7,     26.6
)

tidytax <- tax %>%
  gather(`1970`, `1979`, key = "year", value = "GDP", convert = T)
```

```
tidytax$adj <- c(46.9, 44.4, 43.3, 40.7, 39.0, 37.5, 36.2, 34.8, 34.0, 30.8, 29.7, 27.2, 26.2, 22.5, 20
ggplot(tidytax)+
  geom_line(aes(x = year, y = adj, group = Country), size = .3)+
  theme_void()+
  xlab("")+
  ylab("")+
  scale_y_continuous(limits = c(20, 63))+
  scale_x_continuous(limits = c(1963, 1983))+
  geom_text(data = filter(tidytax, year == 1970),
                  aes(x = year, y = adj, label = Country),
                  nudge_x = -.8, hjust = 1, size = 2.5)+
  geom_text(data = filter(tidytax, year == 1970),
                  aes(x = year, y = adj, label = GDP),
                  nudge_x=-.35,size = 2.5)+
```

```
  geom_text(data = filter(tidytax, year == 1979),
                  aes(x = year, y = adj, label = Country), size = 2.5,
                  nudge_x = 0.8, hjust = 0)+
  geom_text(data = filter(tidytax, year == 1979),
                  aes(x = year, y = adj, label = GDP),
                  nudge_x = 0.35, size = 2.5)+
  annotate("text", x = c(1970, 1979), y = 60,
           label = c("1970", "1979"))+
  annotate("text", x = 1965, y = 58,
    label = "Current Receipts of Government\n as Percentage of Gross Domestic\n Product, 1970 and 1979"
    size = 2)
```

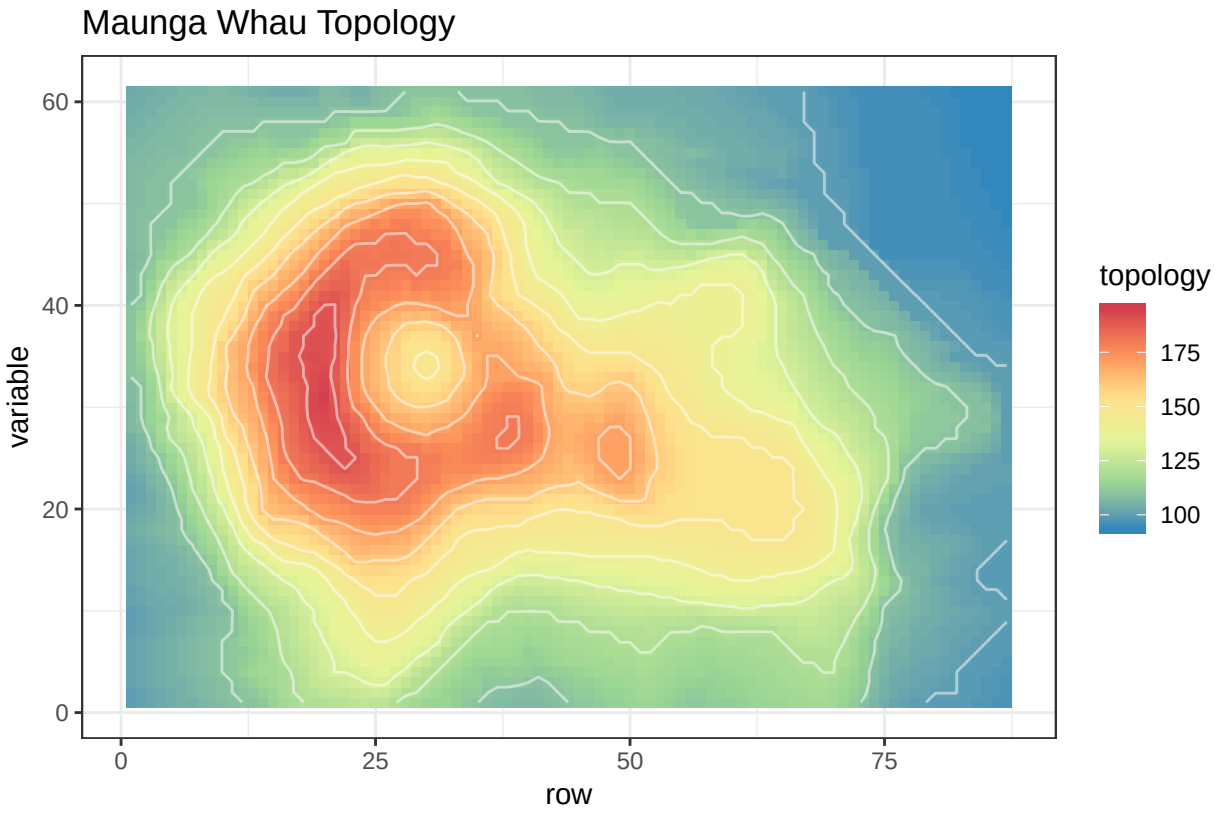
Current Receipts of Government as Percentage of Gross Domestic Product, 1970 and 1979



Plot2

```
volcano_tbl <- as_tibble(volcano)
colnames(volcano_tbl) <- 1:ncol(volcano)
volcano_tbl$row <- 1:nrow(volcano_tbl)

volcano_tbl_new <- gather(volcano_tbl,variable,topology,-row,convert = TRUE)
ggplot(volcano_tbl_new, aes(x=row, y=variable,z=topology,fill=topology))  +
  geom_tile() +
  coord_equal() +
  geom_contour(color = "white", alpha = 0.5) +
  scale_fill_distiller(palette="Spectral", na.value="white") +
  theme_bw() +
  labs(title = "Maunga Whau Topology")
```



Plot3

```
budget <- tribble(
  ~ Expenses,              ~ Jan, ~ Feb, ~ Mar, ~ Apr, ~ May, ~ Jun, ~ Jul, ~ Aug, ~ Sep, ~ Oct, ~ Nov,
  "Domestic Actual",      84853, 84838, 88103, 85072, 88723, 90384, 89374, 95273, 94239, 92394, 96934,
  "Domestic Budget",      83000, 83830, 84668, 85515, 86370, 87234, 88106, 88987, 89877, 90776, 91684,
  "International Actual", 12538, 12438, 14934, 14033, 13945, 15938, 14086, 15934, 13945, 17338, 19384,
  "International Budget", 12000, 12600, 13860, 13200, 13860, 15246, 14520, 15246, 16771, 15972, 16771,
)
```

```
budget_new <- gather(budget,variable,value,-Expenses)

a <- subset(budget_new,Expenses=="Domestic Actual")$value
b <- subset(budget_new,Expenses=="Domestic Budget")$value
c <- subset(budget_new,Expenses=="International Actual")$value
d <- subset(budget_new,Expenses=="International Budget")$value

Domestic_difference <- a-b
International_difference <- c-d
Domestic_proportion <- (a-b)/a
International_proportion <- (c-d)/c
Month <- factor(subset(budget_new, Expenses=="Domestic Actual")$variable, levels=c("Jan","Feb","Mar","Ap
                                                    "Oct","Nov","Dec"))

budget_diff <- tibble(Domestic_difference,International_difference,
                      Domestic_proportion,International_proportion,Month)
budget_diff_new<- gather(budget_diff[c(1,2,5)],key="Type1",
                         value="Difference",Domestic_difference,
                         International_difference,-Month) %>%
                        mutate(Type=gsub("_.*","",Type1))

ggplot(budget_diff_new,aes(x=Month,y=Difference,group=Type))+
  geom_hline(yintercept=0,color="grey70")+
  geom_line(aes(colour=Type))+
  theme_minimal()+
  geom_point(aes(colour=Type))+ylab("")+xlab("")+
  scale_y_continuous(breaks = seq(-4000,14000,2000),
                     limits=c(-4100,14100)) +
  geom_text(data = filter(budget_diff_new, Month == "Dec"),
                  aes(x = Month, y = Difference, label = Type),
                  nudge_x = 0.15, hjust = 0, size = 2.5)+
  scale_x_discrete(expand=c(.15,0))+
  scale_color_manual(values=c( "black","grey40"))+
  theme(legend.position="none",
        panel.grid.major = element_blank(),
        panel.grid.minor = element_blank())+
  labs(title = "Expense Variance from Budget in U.S. Dollars")

budget_diff2 <- gather(budget_diff[c(3,4,5)],key="Type1",
                       value="Difference",Domestic_proportion,
                                International_proportion,-Month) %>%
                        mutate(Type=gsub("_.*","",Type1))

ggplot(budget_diff2,aes(x=Month,y=Difference,group=Type))+
  geom_hline(yintercept=0,color="grey70")+
  geom_line(aes(colour=Type))+
  theme_minimal()+
  geom_point(aes(colour=Type))+ylab("")+xlab("")+
  scale_y_continuous(labels=scales::percent,
                     breaks = seq(-.2,.25,.05),
                     limits=c(-.24,.25)) +
  geom_text(data = filter(budget_diff2, Month == "Dec"),
                  aes(x = Month, y = Difference, label = Type),
```

```
                nudge_x = 0.15, hjust = 0, size = 2.5)+
scale_x_discrete(expand=c(.15,0))+
scale_color_manual(values=c( "black","grey40"))+
theme(legend.position="none",
      panel.grid.major = element_blank(),
      panel.grid.minor = element_blank())+
labs(title = "Percentage Variance of Expenses from Budget")
```