install.packages("dplyr")

install.packages("ggplot2")

library(ggplot2)

library(dplyr)

pop\_cos <- data.frame(

year = c(2010:2022),

population = c(403983,410688,417534,425805,433547,442040,448759,450000,457502,464871,471686,475282,479612),

city = "Colorado Springs"

)

str(pop\_cos)

View(pop\_cos)

names(pop\_cos)

summary(pop\_cos$population)

pop\_cos['population']

pop\_cos$population

pop\_cos[c('year','population')]

pop\_cos[pop\_cos$population > 450000,]

pop\_cos\_2022 <- pop\_cos[pop\_cos$year == "2022", "population"]

pop\_cos\_2010 <- pop\_cos[pop\_cos$year == "2010", "population"]

pop\_change\_cos <- 100 \* (pop\_cos\_2022 - pop\_cos\_2010) / pop\_cos\_2010

pop\_change\_cos

edu\_cos <- read.csv("data/S1501\_Education\_ColoradoSprings.csv")

str(edu\_cos)

View(edu\_cos)

sum(edu\_cos$Count)

edu\_cos["Percentage"] <- 100 \* edu\_cos$Count / sum(edu\_cos$Count)

ggplot(edu\_cos, aes(x=Education\_Level, y=Percentage)) +

geom\_bar(stat = "identity")

ggplot(edu\_cos, aes(x=Education\_Level, y=Percentage)) +

geom\_bar(stat = "identity") +

theme(axis.text.x = element\_text(angle = 45, vjust = 1, hjust=1))

edu\_cos$Education\_Level

edu\_cos$Education\_Level <- factor(edu\_cos$Education\_Level, levels=unique(edu\_cos$Education\_Level))

ggplot(edu\_cos, aes(x=Education\_Level, y=Percentage)) +

geom\_bar(stat = "identity") +

theme(axis.text.x = element\_text(angle = 45, vjust = 1, hjust=1))

race\_cos <- read.csv("data/B02001\_Race\_ColoradoSprings.csv")

str(race\_cos)

View(race\_cos)

race\_cos['Percentage'] <- 100 \* race\_cos$Count / sum(race\_cos$Count)

race\_cos['Percentage'] <- round(race\_cos['Percentage'], 2)

ggplot(race\_cos, aes(x="", y=Percentage, fill=Race)) +

geom\_bar(stat="identity", width=1)

ggplot(race\_cos, aes(x="", y=Percentage, fill=Race)) +

geom\_bar(stat="identity", width=1) +

coord\_polar("y", start=0)

plot3\_race\_cos <- ggplot(race\_cos, aes(x="", y=Percentage, fill=Race)) +

geom\_bar(stat="identity", width=1) +

coord\_polar("y", start=0) +

theme\_minimal() +

theme(axis.title.x = element\_blank(),

axis.title.y = element\_blank()) +

scale\_fill\_brewer(palette="Set2") +

ggtitle("Colorado Springs")

pdf("plot/plot3\_race\_cos.pdf")

print(plot3\_race\_cos)

dev.off()

install.packages("sf")

install.packages("data.table")

install.packages("tmap")

install.packages("dplyr")

library(dplyr)

library(tmap)

library(sf)

library(data.table)

getwd()

sf\_us\_county<-st\_read("data/cb\_2023\_us\_county\_500k/cb\_2023\_us\_county\_500k.shp")

sf\_co\_tract<-st\_read("data/cb\_2023\_08\_CO\_tract\_500k/cb\_2023\_08\_tract\_500k.shp")

df\_ep\_poverty<-read.csv("data/ACSST5Y2022.S1702\_poverty\_family\_El Paso/ACSST5Y2022.S1702-Column-Metadata.csv")

df\_ep\_poverty<-read.csv("data/ACSST5Y2022.S1702\_poverty\_family\_El Paso/ACSST5Y2022.S1702-Data.csv")

class(sf\_us\_county)

View(sf\_us\_county)

sf\_co\_county<-sf\_us\_county%>%filter(STATE\_NAME=="Colorado")

View(sf\_co\_county)

sf\_ep\_county<-sf\_co\_county%>%filter(GEOID=='TYPE\_ANSWER')

sf\_ep\_county<-sf\_co\_county%>%filter(NAMELSAD=='TYPE\_ANSWER')

sf\_ep\_county<-sf\_co\_county%>%filter(NAME=="El\_Paso")

tmap\_mode("plot")

sf\_co\_county <- sf\_us\_county %>% filter(STATE\_NAME == 'Colorado')

sf\_ep\_county <- sf\_co\_county %>% filter(NAMELSAD == 'El Paso County')

tm\_shape(sf\_co\_county)+tm\_polygons()

tm\_shape(sf\_ep\_county)+tm\_polygons(fill="orange",col="blue")

map\_ep\_county <-

tm\_shape(sf\_co\_county) +

tm\_polygons(alpha = 0) +

tm\_shape(sf\_ep\_county) +

tm\_polygons(fill = 'orange', col = 'black', lwd = 2) +

tm\_shape(sf\_co\_county) +

tm\_text("NAME", size = 0.3) +

tm\_compass(north = 0, size = 1) +

tm\_scale\_bar(position = c('right', 'bottom'), width = 9)

map\_ep\_county

View(sf\_co\_tract)

class(sf\_co\_tract)

str(sf\_co\_tract)

sf\_ep\_tract <- sf\_co\_tract %>% filter(NAMELSADCO == 'El Paso County')

View(sf\_ep\_tract)

tm\_shape(sf\_ep\_tract)+tm\_polygons(fill="white")

tm\_shape(sf\_ep\_county)+tm\_polygons(fill\_alpha=0,lwd=3)

tm\_shape(sf\_ep\_tract)+tm\_polygons(fill="white")+

tm\_shape(sf\_ep\_county)+tm\_polygons(fill\_alpha=0,lwd=3)

map\_ep\_tract<-tm\_shape(sf\_ep\_tract)+tm\_polygons(fill="white")+

tm\_shape(sf\_ep\_county)+tm\_polygons(fill\_alpha=0,lwd=3)+

tm\_compass(north=0,size=2)+

tm\_scalebar(position=c("right","bottom"),width=10)+

tm\_layout(frame=F)

map\_ep\_tract

#4.5

View(df\_ep\_poverty)

View(df\_ep\_poverty\_meta)

View("data/ACSST5Y2022.S1702\_poverty\_family\_El Paso/ACSST5Y2022.S1702-Column-Metadata.csv")

nrow(df\_ep\_poverty)

ncol(df\_ep\_poverty)

lt\_poverty\_col <- c(

'GEO\_ID',

'NAME',

'S1702\_C01\_001E',

'S1702\_C01\_041E',

'S1702\_C01\_042E',

'S1702\_C01\_043E',

'S1702\_C01\_044E'

)

lt\_poverty\_new <- c(

'GEO\_ID',

'NAME',

'ttl\_famly',

'famly\_owner',

'famly\_renter',

'famly\_50pct\_poverty',

'famly\_125pct\_poverty'

)

df\_poverty\_cols<-data.frame(

old\_col\_name=lt\_poverty\_col,

new\_col\_name=lt\_poverty\_new)

View(df\_poverty\_cols)

df\_ep\_poverty\_cln<-df\_ep\_poverty[lt\_poverty\_col]

setnames(df\_ep\_poverty\_cln,old=df\_poverty\_cols$old\_col\_name,new=df\_poverty\_cols$new\_col\_name)

df\_ep\_poverty\_cln<-df\_ep\_poverty\_cln[-1,]

rownames(df\_ep\_poverty\_cln)<-NULL

View(df\_ep\_poverty\_cln)

str(df\_ep\_poverty\_cln)

df\_ep\_poverty\_cln$ttl\_famly<as.numeric(df\_ep\_poverty\_cln$ttl\_famly)

df\_ep\_poverty\_cln[,3:7]<-sapply(df\_ep\_poverty\_cln[,3:7],as.numeric)%>%as.data.frame()

df\_ep\_poverty\_cln["pct\_fam\_renter"]<-100\*df\_ep\_poverty\_cln$famly\_renter/df\_ep\_poverty\_cln$ttl\_famly

df\_ep\_poverty\_cln["pct\_fam\_pov\_50pct"]<-100\*df\_ep\_poverty\_cln$famly\_50pct\_poverty/df\_ep\_poverty\_cln$ttl\_famly

df\_ep\_poverty\_cln["pct\_fam\_pov\_125pct"]<-100\*df\_ep\_poverty\_cln$famly\_125pct\_poverty/df\_ep\_poverty\_cln$ttl\_famly

df\_ep\_poverty\_cln[is.na(df\_ep\_poverty\_cln)]<-0

View(df\_ep\_poverty\_cln)

hist(df\_ep\_poverty\_cln$ttl\_famly)

hist(df\_ep\_poverty\_cln$pct\_fam\_renter,col="orange")

hist(df\_ep\_poverty\_cln$pct\_fam\_pov\_125pct,col="blue",add=T)

hist(df\_ep\_poverty\_cln$pct\_fam\_pov\_50pct,col="green",add=T)

sf\_ep\_tract\_pov<-left\_join(sf\_ep\_tract,df\_ep\_poverty\_cln,by=c("GEOIDFQ"="GEO\_ID"))

tmap\_mode("plot")

lt\_map\_col <- c("ttl\_famly", "pct\_fam\_renter", "pct\_fam\_pov\_50pct", "pct\_fam\_pov\_125pct")

for (column in lt\_map\_col) {

print(column)

print(

tm\_shape(sf\_ep\_tract\_pov) +

tm\_polygons(fill = column)

)

}

map\_ep\_tract\_famly<-tm\_shape(sf\_ep\_tract\_pov)+tm\_polygons(fill="ttl\_famly",fill.scale = tm\_scale\_intervals(values="brewer.yl\_gn\_bu"),fill.legend=tm\_legend("#offamily"))+tm\_layout(legend.outside=T)

map\_ep\_tract\_50pct\_pov<-tm\_shape(sf\_ep\_tract\_pov)+

tm\_polygons(fill="pct\_fam\_pov\_50pct",

fill.scale=tm\_scale\_continuous(values="brewer.greens"),

fill.legend=tm\_legend("below50%poverty(%)"))+

tm\_layout(legend.outside=T)

map\_ep\_tract\_50pct\_pov