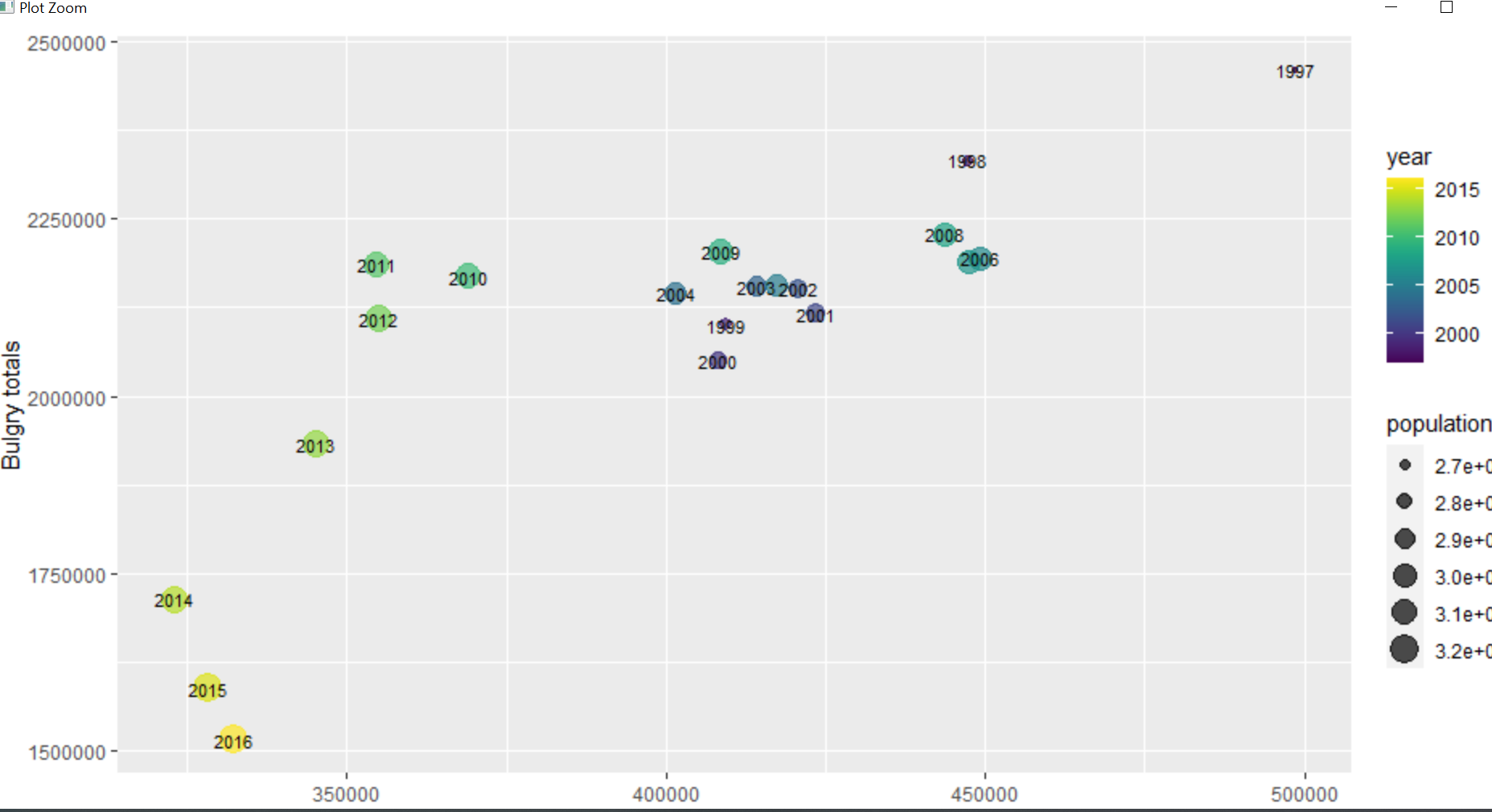
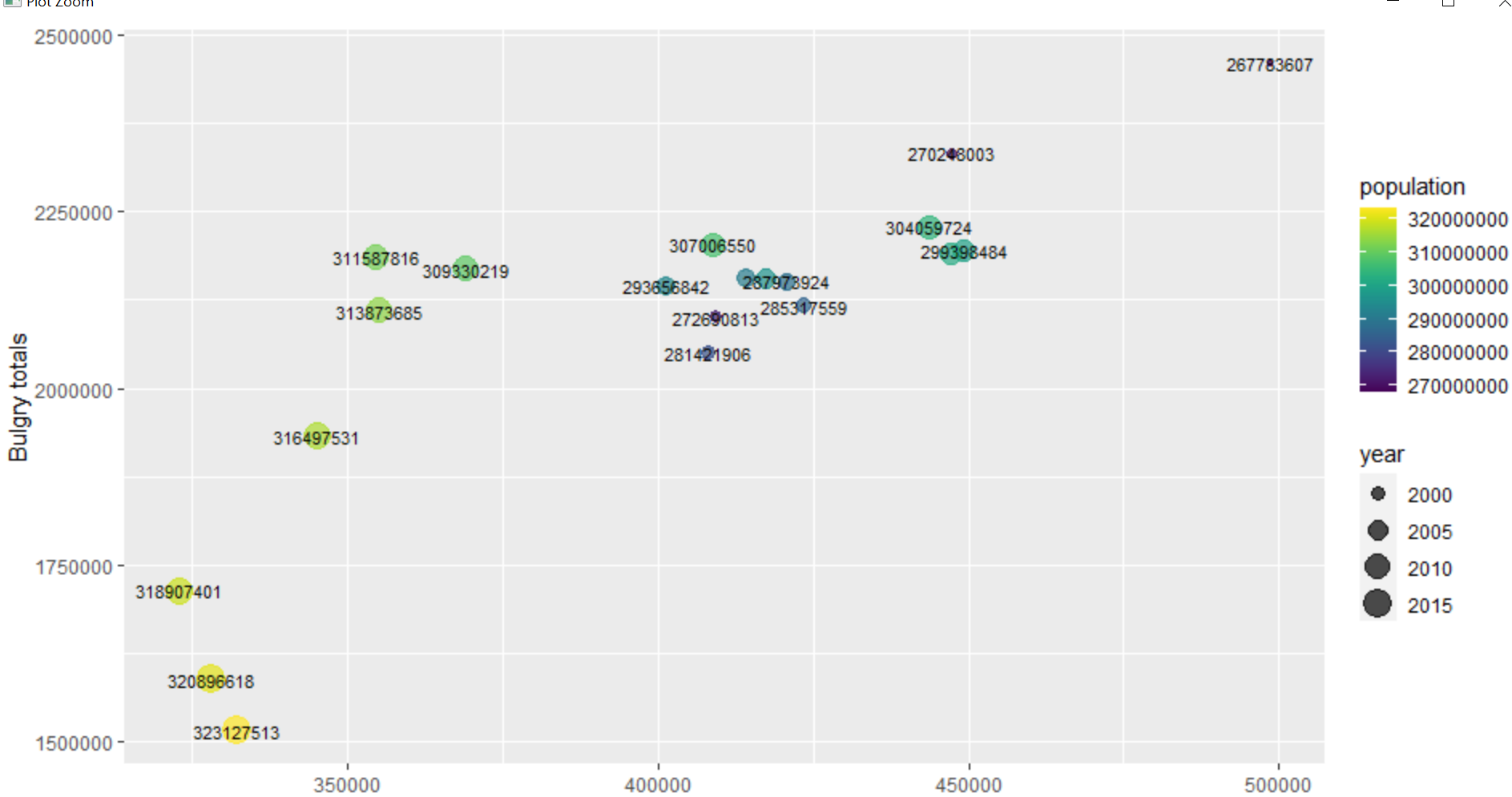
# 502:

Create a bubble chart of your choice in R, but also incorporating another attribute for the color channel. Do not use the example done in class, but can follow a similar pattern/structure.



I have changed color to population and shape size to year. And also removed scientific notation



**Code:**

library(cowplot)

library(ggplot2)

library(scales)

library(reshape2)

library(xlsx)

library(tibbletime)

library(dplyr)

library(lubridate)

library(plotly)

library(trelliscopejs)

library(viridis)

#############################################################################

# Reading data

#############################################################################

fbi<-read.csv("C:/Users/Malik/Documents/GitHub/Data-Visualization-Data502/Dataset/DATA\_FBI Crime Rate.csv")

fbi\_totals<-fbi[c(1:20), c(1,2,3,5,9,11,13,15,17,19,21)]

fbi\_rates<- fbi[c(1:20), c(1,2,4,6,10,12,14,16,18,20,22)]

colnames(fbi\_totals)<- c("year", "population", "violent\_crimes", "murder", "rape", "robbery", "aggravated\_assault", "property\_crimes", "bulgarly", "larceny", "motor\_theft")

colnames(fbi\_rates)<- c("year", "population", "violent\_crimes\_rate", "murder\_rate", "rape\_rate", "robbery\_rate","aggravated\_assault\_rate", "property\_crimes\_rate", "bulgarly\_rate", "larceny\_rate", "motor\_theft\_rate")

fbi\_violent\_totals<- fbi\_totals[,c(1:7)]

fbi\_property\_totals<-fbi\_totals[,c(1:2,8:11)]

fbi\_violent\_rates<- fbi\_rates[,c(1:7)]

fbi\_property\_rates<-fbi\_rates[,c(1:2,8:11)]

fbi\_violent\_melt<- reshape2::melt(fbi\_violent\_totals, id.vars=c("year","population"), measure.vars=c(3:ncol(fbi\_violent\_totals)), value.name="value")

ggplot(fbi\_violent\_melt, aes(year, value, color=variable)) + geom\_line() +xlab("year") + ylab("value") + ggtitle("violent crimes")

fbi\_property\_melt<- reshape2::melt(fbi\_property\_totals, id.vars=c("year","population"), measure.vars=c(3:ncol(fbi\_property\_totals)), value.name="value")

fbi\_violent\_rates\_melt<- reshape2::melt(fbi\_violent\_rates, id.vars=c("year","population"), measure.vars=c(3:ncol(fbi\_violent\_rates)), value.name="value")

fbi\_property\_rates\_melt<- reshape2::melt(fbi\_property\_rates, id.vars=c("year","population"), measure.vars=c(3:ncol(fbi\_property\_rates)), value.name="value")

violent\_property\_totals<- rbind(fbi\_violent\_melt, fbi\_property\_melt)

violent\_property\_rates<-rbind(fbi\_violent\_rates\_melt, fbi\_property\_rates\_melt)

all\_crimes<- cbind(violent\_property\_totals, violent\_property\_rates)

all\_crimes<-all\_crimes[,c(1,2,3,4,7,8)]

colnames(all\_crimes)<-c("year","population","crimes","crime\_total\_value","crime\_rates","crime\_rate\_values")

######

rob = subset(all\_crimes, all\_crimes$crimes %in% c("robbery"))

bul =  subset(all\_crimes, all\_crimes$crimes %in% c("bulgarly"))

rob = rob[,c(1,2,4,6)]

bul = bul[,c(1,2,4,6)]

colnames(rob) = c("year", "population", "rob\_totals", "rob\_rated")

colnames(bul) = c("year", "population", "bul\_totals", "bul\_rated")

sub\_data2 = cbind(rob,bul)

sub\_data2 = sub\_data2[,c(1,2,3,4,6,7,8)]

######## plot ########

ggplot(sub\_data2, aes(x=rob\_totals , y = bul\_totals, size=population, label = year )) +

  geom\_point(alpha =0.7, aes(color=year)) +

  scale\_colour\_viridis(option = "D") +

  geom\_text(size=3,check\_overlap = T,nudge\_y = .5) +

    xlab("robbery Totals ") + ylab("Bulgry totals")

options(scipen=10000)

ggplot(sub\_data2, aes(x=rob\_totals , y = bul\_totals, size=year, label = population )) +

geom\_point(alpha =0.7, aes(color=population)) +

scale\_colour\_viridis(option = "D") +

geom\_text(size=3,check\_overlap = T,nudge\_y = .5) +

xlab("robbery Totals ") + ylab("Bulgry totals")