

# Assignment 3

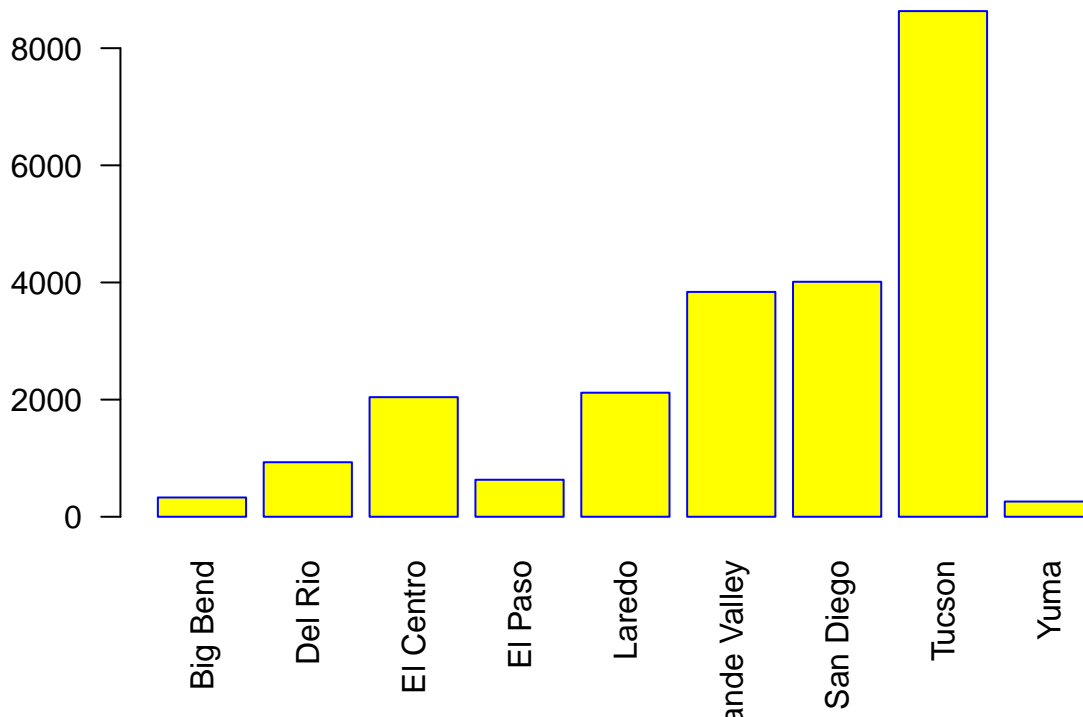
*Steven Tran*

*February 7, 2018*

```
## Reading in Data
BP2010 <- read.csv("BP Apprehensions 2010.csv", header = TRUE, stringsAsFactors = FALSE)
PB2017 <- read.csv("PB Apprehensions 2017.csv", header = TRUE, stringsAsFactors = TRUE)
PBmonthly <- read.csv("monthly_sum.csv", header = TRUE, stringsAsFactors = TRUE)
rownames(PBmonthly) <- PBmonthly[,1]

## Displaying Data By Sector
rownames(BP2010) <- BP2010[,1]
x <- barplot(BP2010[1:9,13], names.arg = rownames(BP2010)[1:9],
             las=2,
             axisnames=TRUE,
             main="2010 Border Patrol Apprehensions by Sector",
             border="blue",
             col="yellow")
```

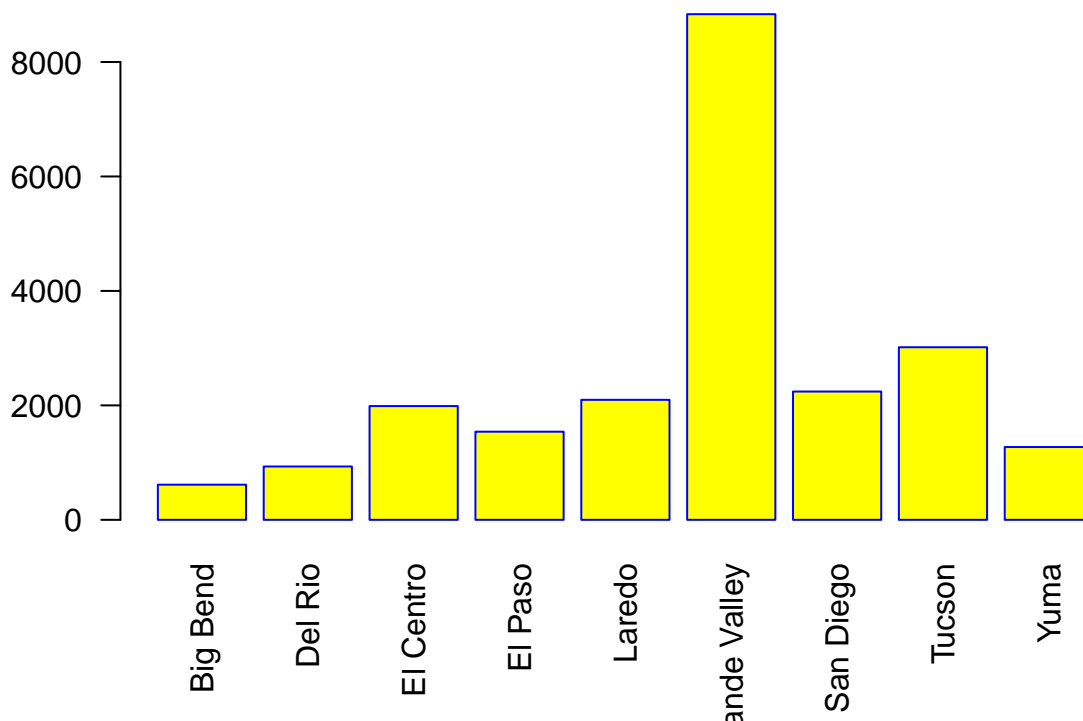
**2010 Border Patrol Apprehensions by Sector**



```
rownames(PB2017) <- PB2017[,1]
barplot(PB2017[1:9,13], names.arg = rownames(PB2017)[1:9],
        las=2,
        axisnames=TRUE,
```

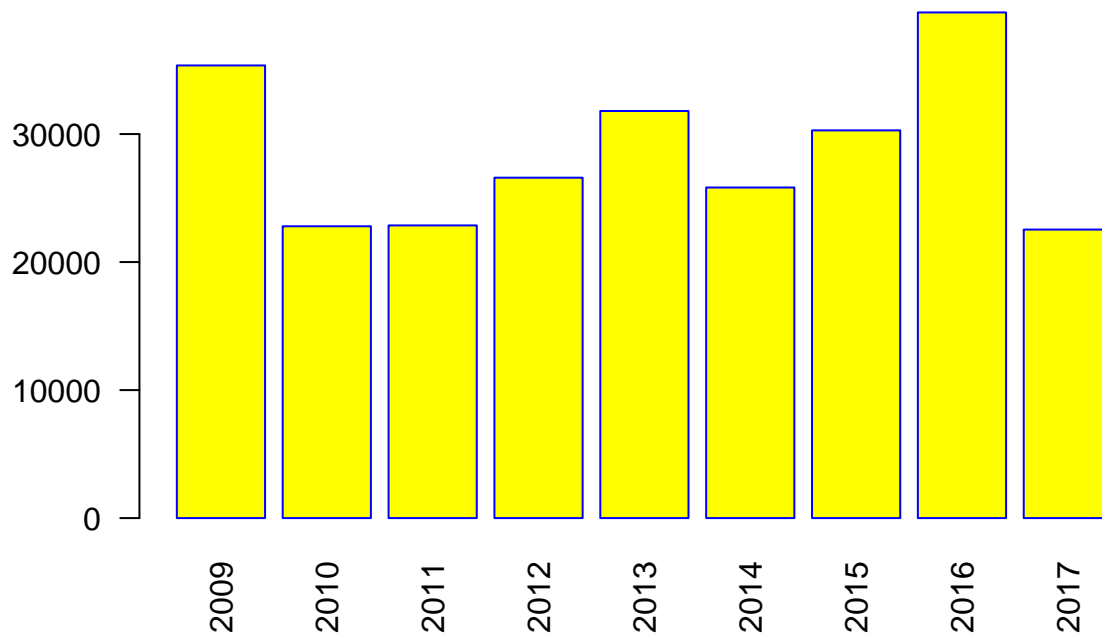
```
main="2017 Border Patrol Apprehensions by Sector",
border="blue",
col="yellow")
```

## 2017 Border Patrol Apprehensions by Sector



```
##Display Data By Year
barplot(rev(PBmonthly[1:9,13]), names.arg = rev(rownames(PBmonthly)[1:9]),
        las=2,
        axisnames=TRUE,
        main="Border Patrol Apprehensions by Year",
        border="blue",
        col="yellow")
```

## Border Patrol Apprehensions by Year

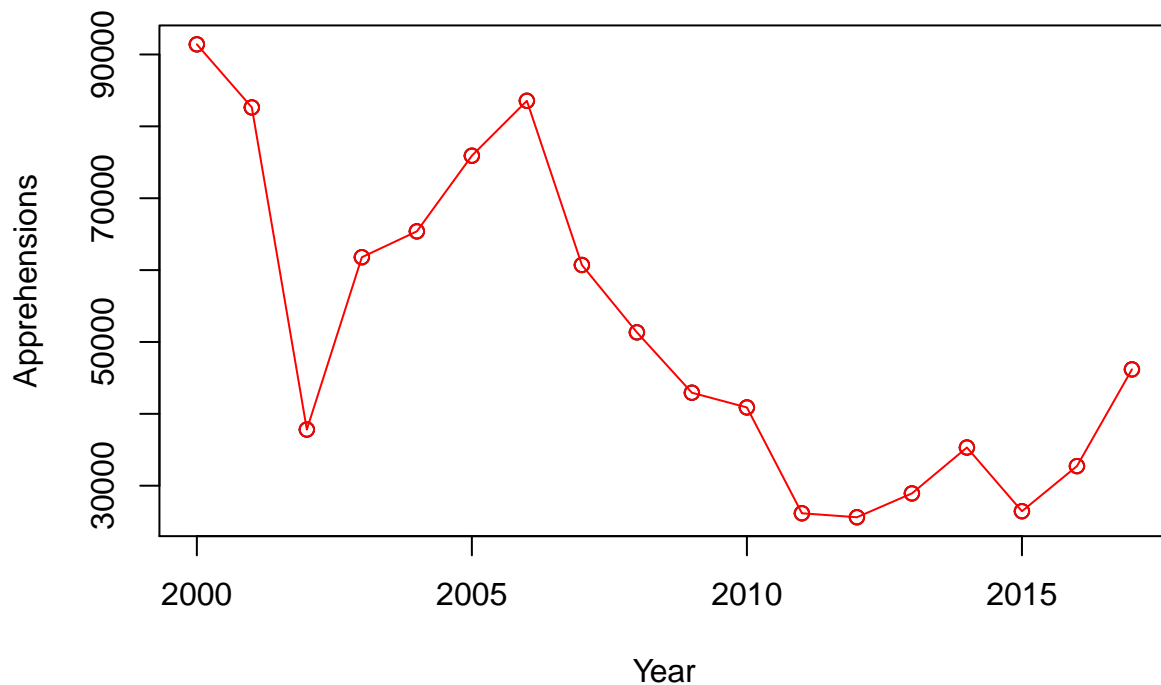


```
## T-test for Tucson in 2010 and Rio Grande Valley in 2017
t2010 <- t(BP2010)
t2017 <- t(PB2017)
t.test(as.numeric(t2010[2:13, 8]), as.numeric(t2017[2:13, 6]))
```

```
##
## Welch Two Sample t-test
##
## data: as.numeric(t2010[2:13, 8]) and as.numeric(t2017[2:13, 6])
## t = 1.9547, df = 21.973, p-value = 0.06346
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -379.5935 12819.5935
## sample estimates:
## mean of x mean of y
## 17683.5 11463.5
```

```
plot(PBmonthly$year, PBmonthly$October, xlab = "Year", ylab = "Apprehensions", type = "p", main = "Apprehensions by Year")
lines(PBmonthly$year, PBmonthly$October, col = "red")
points(PBmonthly$year, PBmonthly$October, col = "red")
```

## Apprehensions By Year

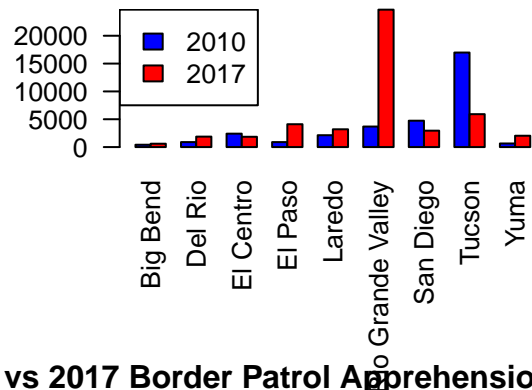
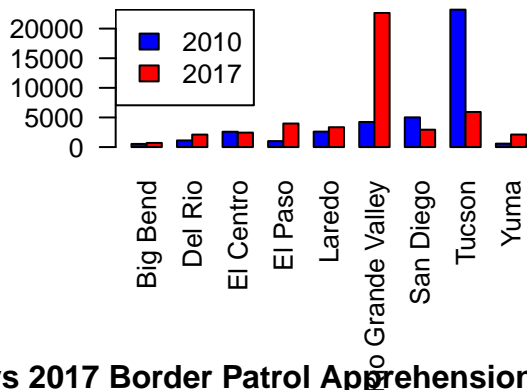


```
## Creates a 2 x 9 matrix from the 2010 data and 2017 for specified month
sideBySideMatrix <- function(month){
  matrix(c(BP2010[1:9,month], PB2017[1:9,month]), nrow = 2, byrow = TRUE)
}

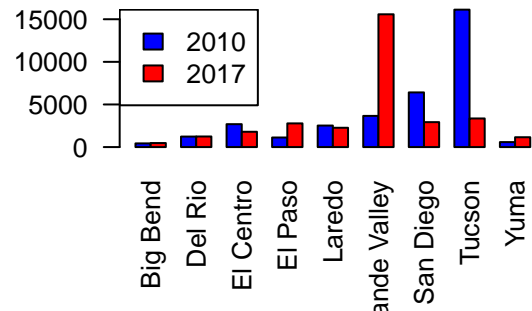
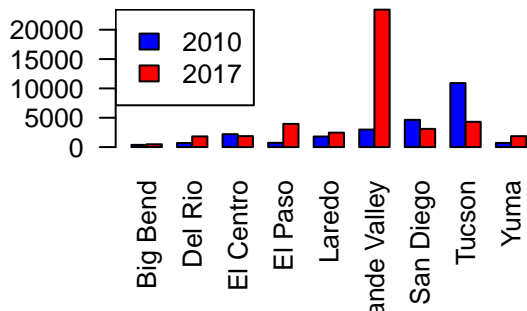
## Creates the barplot for a given month
sideBySideBarPlot <- function(month, monthString){
  barplot(sideBySideMatrix(month), names.arg = rownames(BP2010),
    las=2,
    axisnames=TRUE,
    beside=TRUE,
    col=c("blue", "red"),
    main = paste("2010 vs 2017 Border Patrol Apprehensions in", monthString, sep=" "))
  legend("topleft",
    c("2010", "2017"),
    fill = c("blue", "red"))
}

## Creates the side by side bar plots for each month
par(mfrow=c(2,2))
sideBySideBarPlot(2, "October")
sideBySideBarPlot(3, "November")
sideBySideBarPlot(4, "December")
sideBySideBarPlot(5, "January")
```

vs 2017 Border Patrol Apprehensions in vs 2017 Border Patrol Apprehensions in

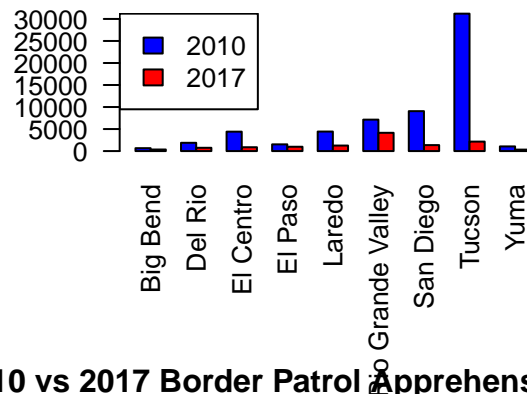
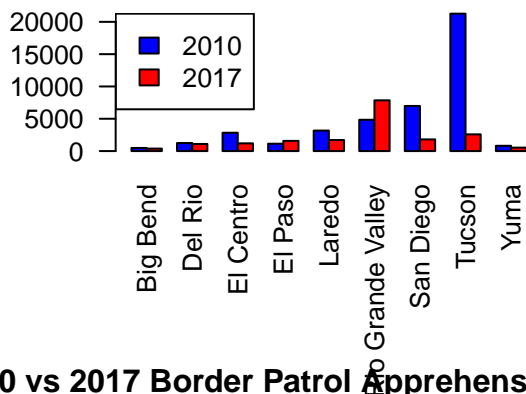


vs 2017 Border Patrol Apprehensions in vs 2017 Border Patrol Apprehensions in

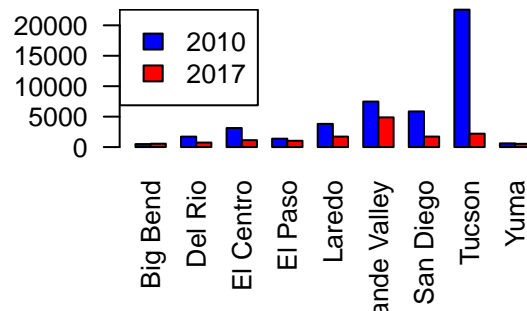
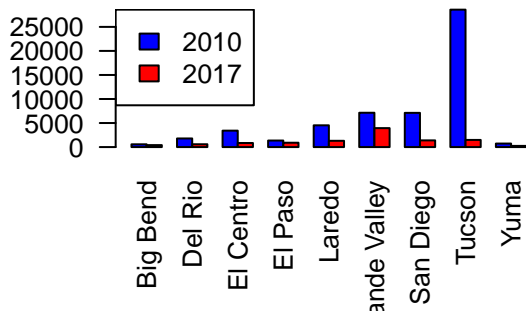


```
sideBySideBarPlot(6, "February")
sideBySideBarPlot(7, "March")
sideBySideBarPlot(8, "April")
sideBySideBarPlot(9, "May")
```

vs 2017 Border Patrol Apprehensions in 0 vs 2017 Border Patrol Apprehensions in

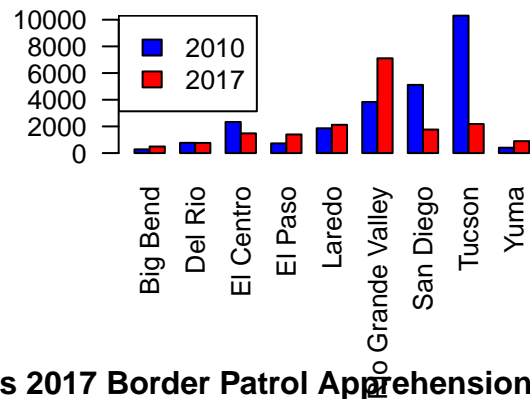
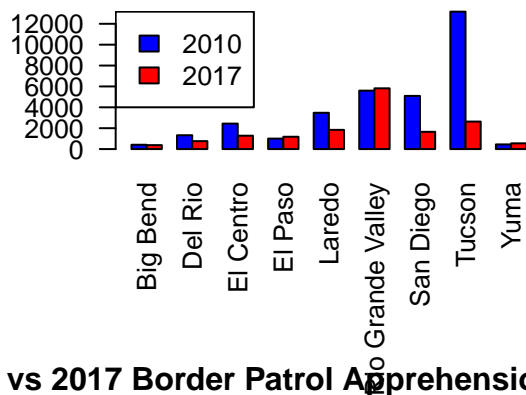


10 vs 2017 Border Patrol Apprehensions in 10 vs 2017 Border Patrol Apprehensions

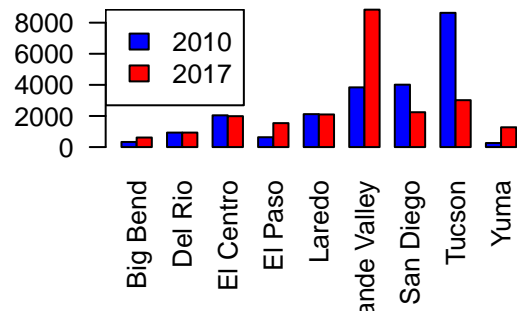
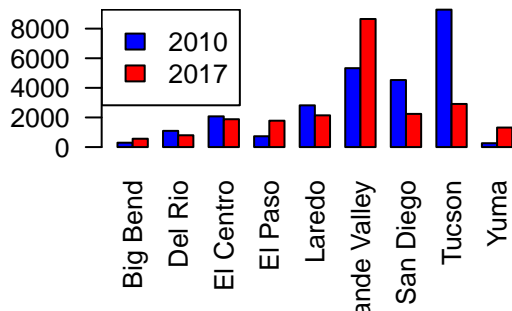


```
sideBySideBarPlot(10, "June")
sideBySideBarPlot(11, "July")
sideBySideBarPlot(12, "August")
sideBySideBarPlot(13, "September")
```

## 10 vs 2017 Border Patrol Apprehensions



## 2010 vs 2017 Border Patrol Apprehensions in S



```
par(mfrow=c(1,1))
x <- as.vector(t(PBmonthly))
y <- ts(rev(x), start = c(2000, 10), frequency = 12)
ts.plot(y, gpars=list(xlab="year", ylab="Apprehensions", lty=c(1:3)))
```

