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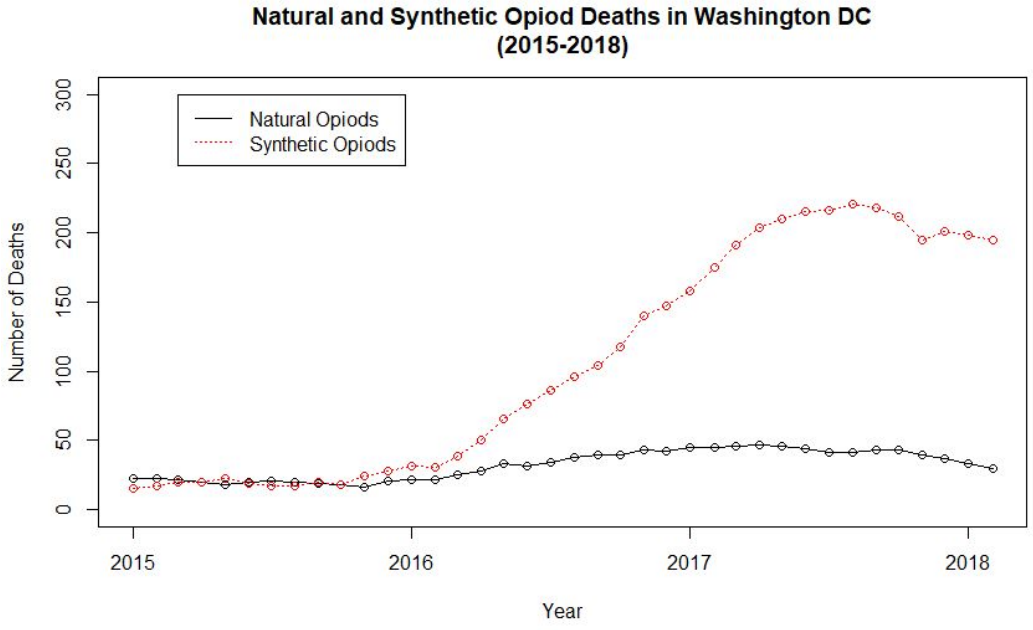
BIOSTAT 203A LAB 1A
Professor Hilary Aralis
18 Nov 2019

Lab 5

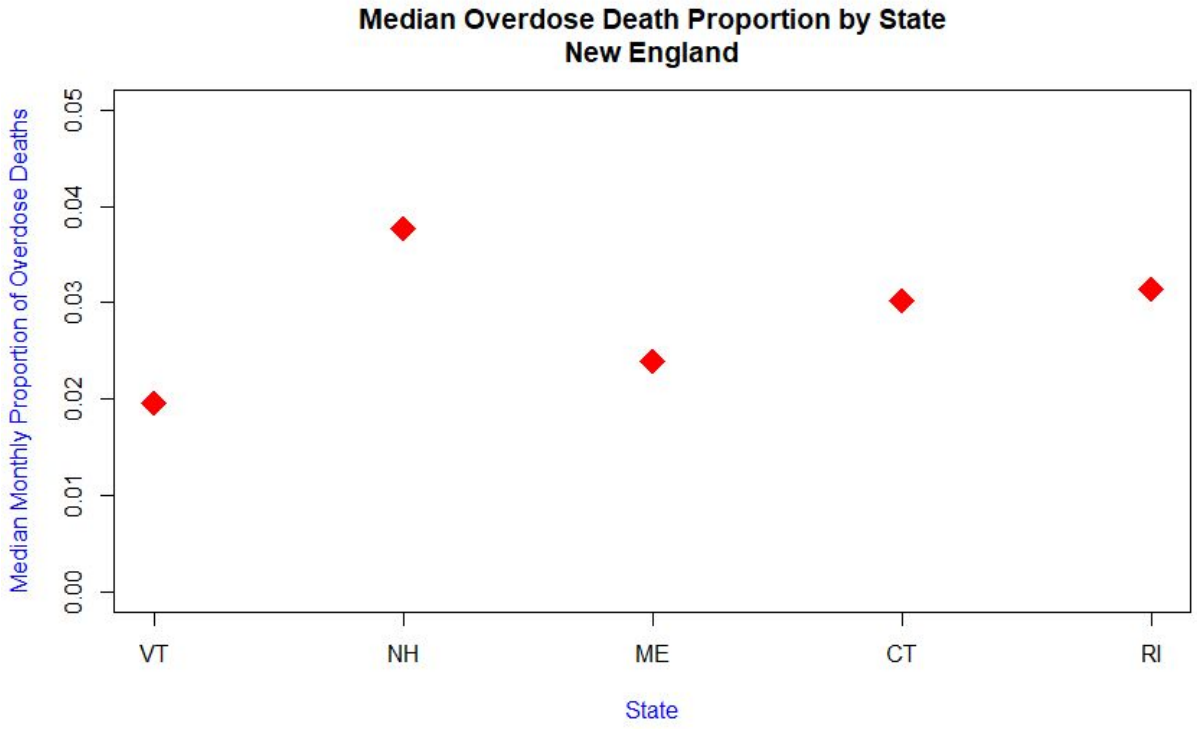
Exercise 1

```
dc <- ods[ods$STATE == "DC",]
dc <- dc[order(dc$DATA_DATE),]

plot(dc$DATA_DATE, dc$NUMBER_NATURAL_OPIOD_DEATHS,
    type="o",
    main = "Natural and Synthetic Opiod Deaths in Washington DC\n(2015-2018)",
    xlab = "Year",
    ylim = c(0, 300),
    ylab = "Number of Deaths",
    col = "black")

lines(dc$DATA_DATE, dc$NUMBER_SYNTHETIC_OPIOD_DEATHS, type="o", lty=3,
col="red")

legend(as.Date("03/01/2015", format="%m/%d/%Y"), 300,
      legend = c("Natural Opiods","Synthetic Opiods"),
      col=c("black","red"),
      lty=c(1,3))
```



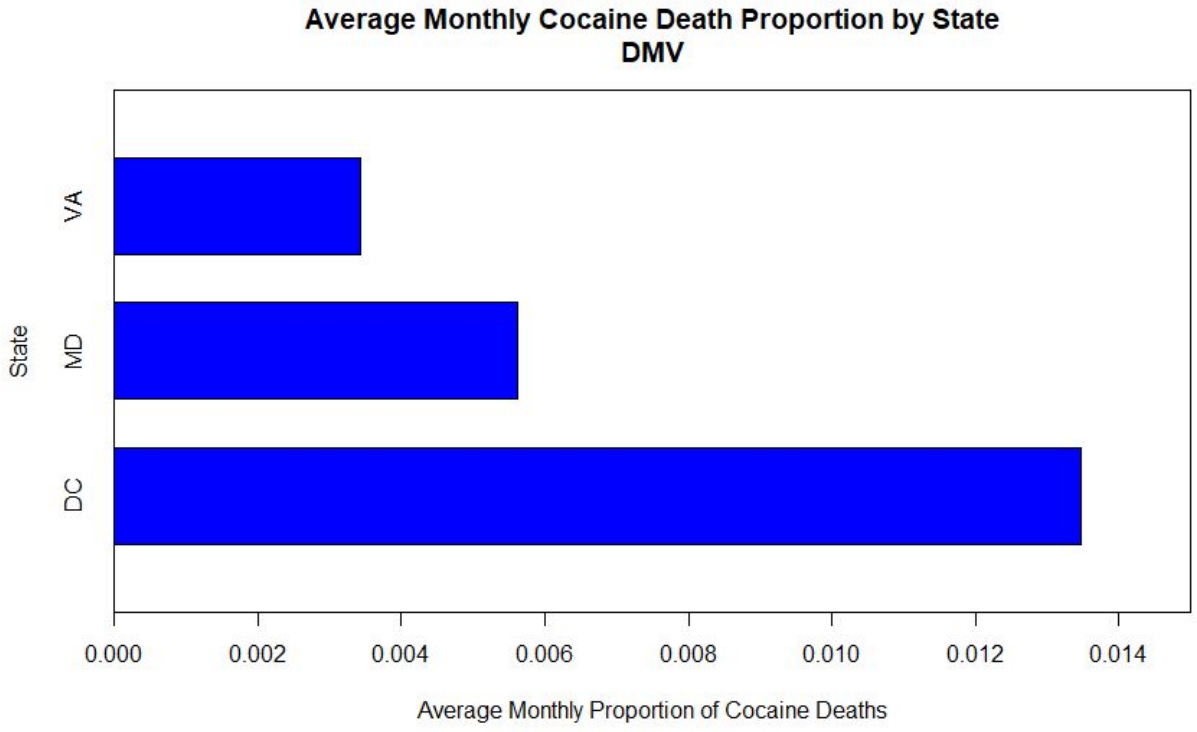
Exercise 2

```
medprop <-
tapply(neweng$NUMBER_DRUG_OVERDOSE_DEATHS/neweng$NUMBER_DEATHS,
                neweng$STATE,
                median, na.rm=T)

medprop

medprop <- medprop[c(5, 3, 2, 1, 4)]

medprop

plot(medprop,
    type = "p",
    pch = 18,
    axes = FALSE,
    ann = FALSE,
    cex = 2.5,
    col = "red",
    ylim = c(0, 0.05)
    )

axis(1, at=1:5, lab = names(medprop))
axis(2)

box()

title (main = "Median Overdose Death Proportion by State\nNew England", col.lab
      = "black")
title (ylab = "Median Monthly Proportion of Overdose Deaths", col.lab = "blue")
title (xlab = "State", col.lab = "blue")
```


Median Overdose Death Proportion by State
New England
Median Monthly Proportion of Overdose Deaths
0.00
0.01
0.02
0.03
0.04
0.05
VT
NH
ME
CT
RI
State

Exercise 3

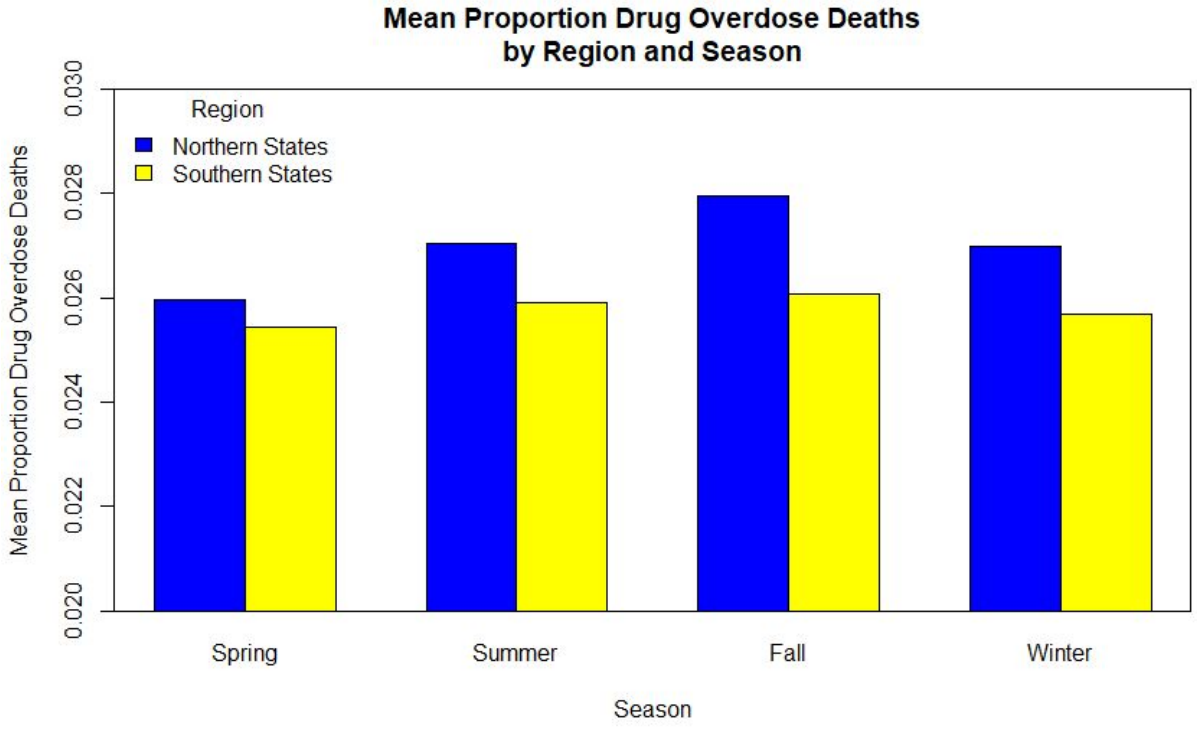
```
dmv <- droplevels(ods[ods$STATE %in% c('DC','MD','VA'),])

dmvcdprop <- tapply(dmv$NUMBER_COCAINE_DEATHS/dmv$NUMBER_DEATHS,
            dmv$STATE,
            mean, na.rm=T)

barplot(dmvcdprop,
      main = "Average Monthly Cocaine Death Proportion by State\nDMV",
      xlab = "Average Monthly Proportion of Cocaine Deaths",
      ylab = "State",
      col = "blue",
      xlim = c(0, 0.015),
      ylim = c(0,3),
      width = 0.6,
      space = 0.5,
      horiz = TRUE)
box()
```



Exercise 4

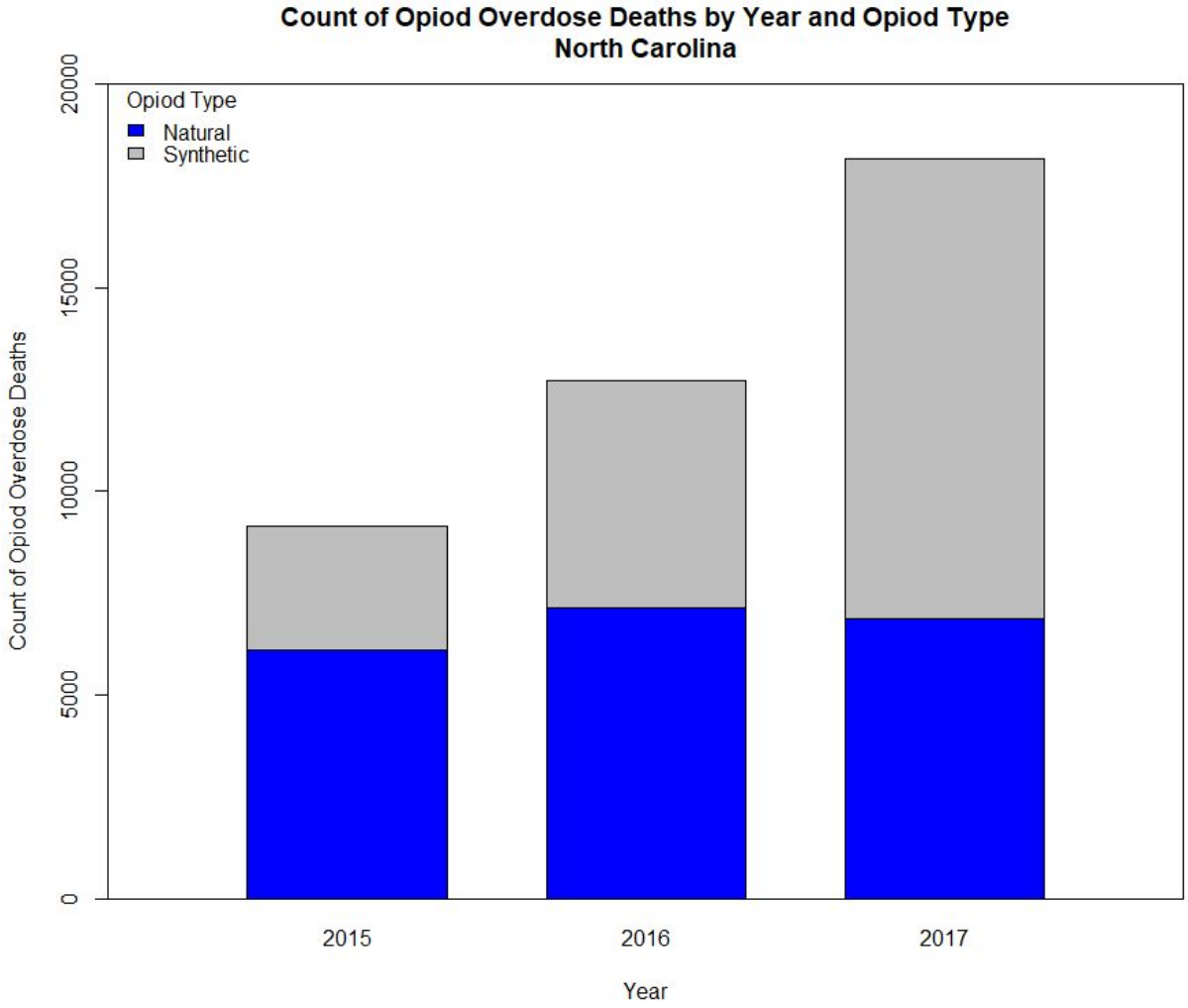
```
north <- c('CT', 'DC', 'MD', 'ME', 'NH', 'NY', 'OR', 'RI', 'VT', 'WA')
south <- c('NC', 'NM', 'NV', 'OK', 'SC', 'UT', 'VA', 'WV')

fall   <- c('September', 'October', 'November')
spring <- c('March', 'April', 'May')
winter <- c('December', 'January', 'February')
summer <- c('June', 'July', 'August')

aa <- ods %>%
  mutate(LOCATION = 1*(STATE %in% north) +
           2*(STATE %in% south),
         DEATH_PROP_DRUGOVERDOSE =
NUMBER_DRUG_OVERDOSE_DEATHS/NUMBER_DEATHS) %>%
  mutate(SEASON = 1*(MONTH %in% spring) +
           2*(MONTH %in% summer) +
           3*(MONTH %in% fall) +
           4*(MONTH %in% winter)) %>%
  filter(SEASON %in% c(1,2,3,4), LOCATION %in% c(1,2)) %>%
  group_by(SEASON,LOCATION) %>%
  summarize(AVGOVD = mean(DEATH_PROP_DRUGOVERDOSE))

aa

bb <- matrix(as.matrix(aa[,3]),nrow = 2,ncol = 4, byrow = FALSE)

colnames(bb) <- c("Spring","Summer","Fall", "Winter")
row.names(bb) <- c("Northern States","Southern States")

bb

barplot(bb,
        beside = TRUE,
        main = "Mean Proportion Drug Overdose Deaths\nby Region and Season",
        xlab = "Season",
        ylab = "Mean Proportion Drug Overdose Deaths",
        col = c("blue", "yellow"),
        ylim = c(0.020,0.03),
        xpd = FALSE)
box()

legend("topleft", legend=c("Northern States","Southern States"),
       bty="n",
```

```
title = c("Region"),
fill=c("blue","yellow"))
```



Exercise 5

```
ee <- ods %>%
  filter(YEAR %in% c(2015,2016,2017), STATE %in% c('NC')) %>%
  group_by(STATE,YEAR) %>%
  summarize(SUMNOP = sum(NUMBER_NATURAL_OPIOD_DEATHS), SUMSOP =
sum(NUMBER_SYNTHETIC_OPIOD_DEATHS))

ee

ff <- matrix(as.matrix(ee[,3:4]), nrow = 2, ncol = 3, byrow = TRUE)

colnames(ff) <- c("2015", "2016", "2017")
rownames(ff) <- c("Natural", "Synthetic")

ff

barplot(ff,
        main = "Count of Opiod Overdose Deaths by Year and Opiod Type\nNorth Carolina",
        xlab = "Year",
        ylab = "Count of Opiod Overdose Deaths",
        col = c("blue", "gray"),
        ylim = c(0,20000),
        xlim = c(0,3),
        width = 0.6,
        space = 0.5)

box()

legend("topleft", c("Natural", "Synthetic"),
       bty = "n",
       title = "Opiod Type",
       fill = c("blue", "gray"))
```


Count of Opiod Overdose Deaths by Year and Opiod Type
North Carolina
Opiod Type
Natural
Synthetic
Count of Opiod Overdose Deaths
0
5000
10000
15000
20000
2015
2016
2017
Year