Trenton Bellinger
Stats 10
Lab 1

Section 1

#1a

**heights <- c(71, 70, 64)**
**heights**

[1] 71 70 64

#1b

**names <- c("Trent", "John", "Jill")**
**names**

[1] "Trent" "John"  "Jill"

#1c

**two_columns <- cbind(heights, names)**
**two_columns**

```
     heights names
[1,] "71"    "Trent"
[2,] "70"    "John"
[3,] "64"    "Jill"
```

This command binded the two data vectors into columns of a table.

**class(two_columns)**

[1] "matrix" "array"

The class of this new object is a matrix (and/or array).

#2a

**NCbirths <- read.csv('births.csv')**

#2b

**> head(NCbirths)**

```
  Gender Premie weight Apgar1 Fage Mage Feduc Meduc TotPreg Visits   Marital Racemom
Racedad Hispmom
1   Male     No    124     8   31   25    13    14      1     13   Married   White   White NotHisp
2 Female     No    177     8   36   26     9    12      2     11 Unmarried   White   White Mexican
3   Male     No    107     3   30   16    12     8      2     10 Unmarried   White Unknown Mexican
4 Female     No    144     6   33   37    12    14      2     12 Unmarried   White   White NotHisp
5   Male     No    117     9   36   33    10    16      2     19   Married   White   Black NotHisp
6 Female     No     98     4   31   29    14    16      3     20   Married   White   White NotHisp
  Hispdad Gained     Habit MomPriorCond BirthDef    DelivComp BirthComp
1 NotHisp     40 NonSmoker        None     None At Least One      None
2 Mexican     20 NonSmoker        None     None At Least One      None
3 Unknown     70 NonSmoker At Least One     None At Least One      None
4 NotHisp     50 NonSmoker        None     None At Least One      None
5 NotHisp     40 NonSmoker At Least One     None        None      None
6 NotHisp     21 NonSmoker        None     None        None      None
```

#3a

**find.package('maps')**

[1] "/Users/trentbellinger/Library/R/x86_64/4.1/library/maps"

#3b

**library(maps)**
**map('state')**

#4a

**weights <- NCbirths$weight**

#4b

The weights are in ounces.

#4c

**weights_in_pounds <- weights / 16**

#4d

**weights_in_pounds[1:20]**

```
 [1]  7.7500 11.0625  6.6875  9.0000  7.3125  6.1250  9.1875  8.6250  6.5000  7.6875  9.5625
[12]  8.0625  7.4375  6.7500  6.6250  7.8125  7.1875  8.0000  8.2500  5.1875
```

Section 2

#1

7.2532

#2

**tally(NCbirths$Habit, format='percent')**

X
NonSmoker Smoker
90.61245 9.38755

9.38755% of mothers in the sample smoke.

#3

**21 - tally(NCbirths$Habit, format='percent')[2]**

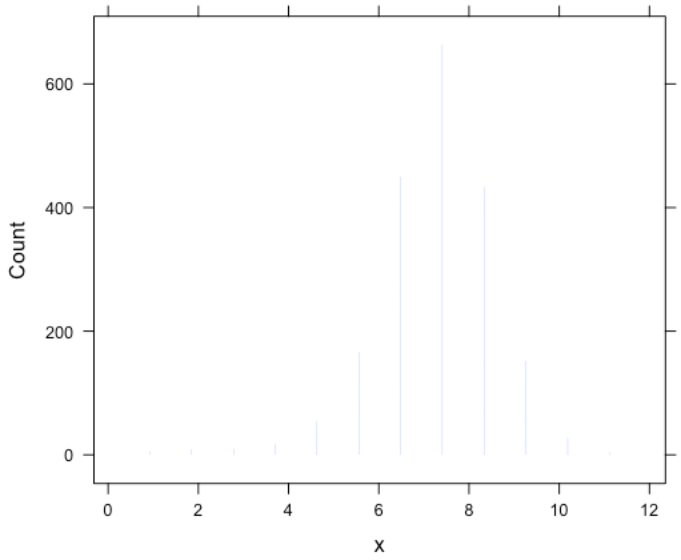
Smoker
11.61245

The percentage found in #2 is 11.61245 off from the CDC's report.

Section 3

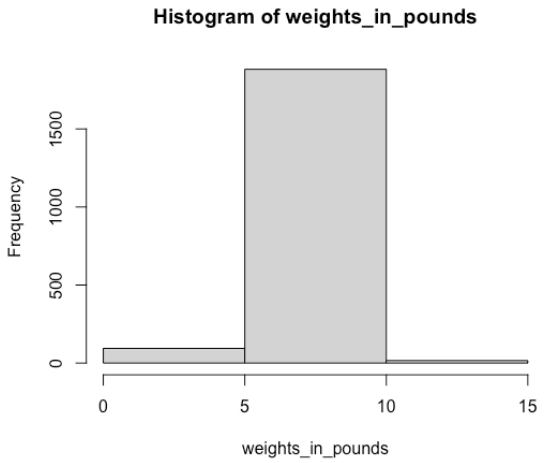
#1

**dotPlot(weights_in_pounds)**

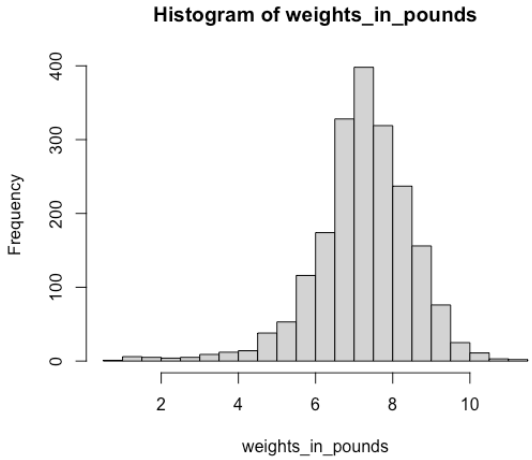


#2

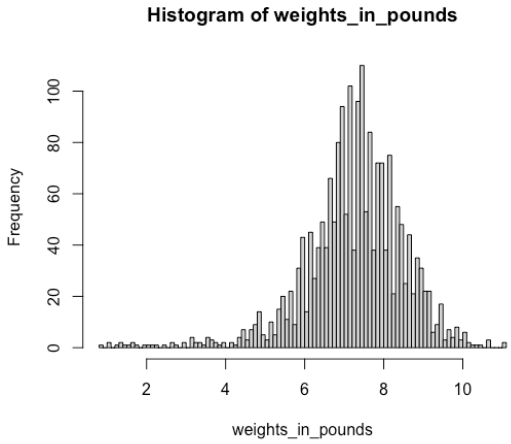
**hist(weights_in_pounds, breaks=2)**




**hist(weights_in_pounds, breaks=19)**

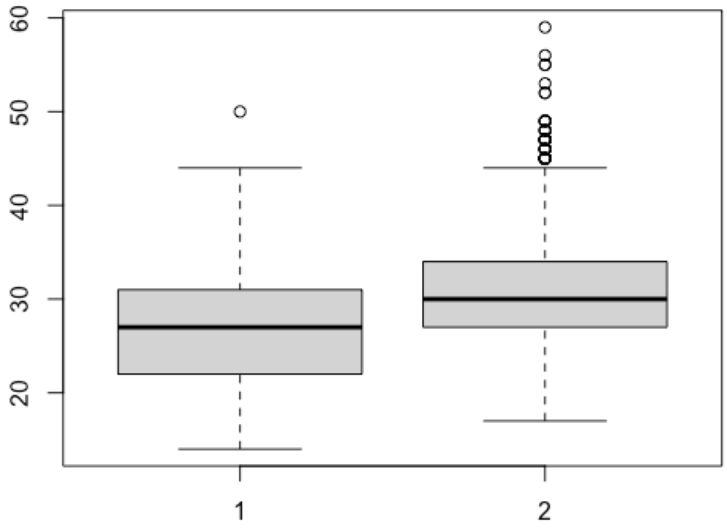



**hist(weights_in_pounds, breaks=99)**

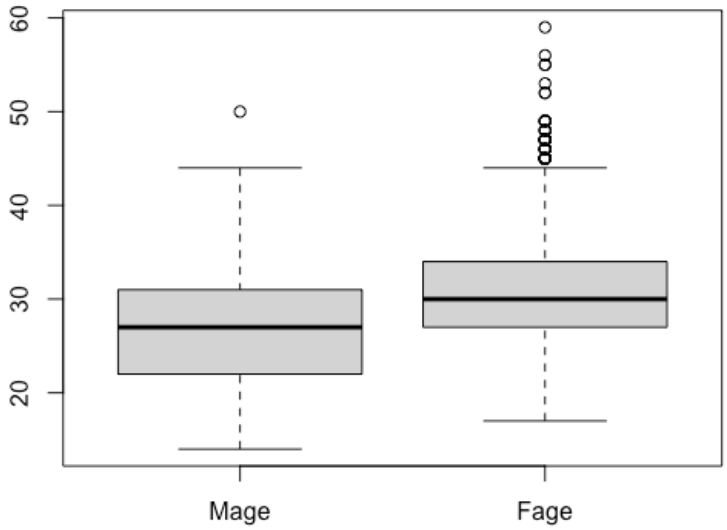


#3

**boxplot(NCbirths$Mage, NCbirths$Fage)**



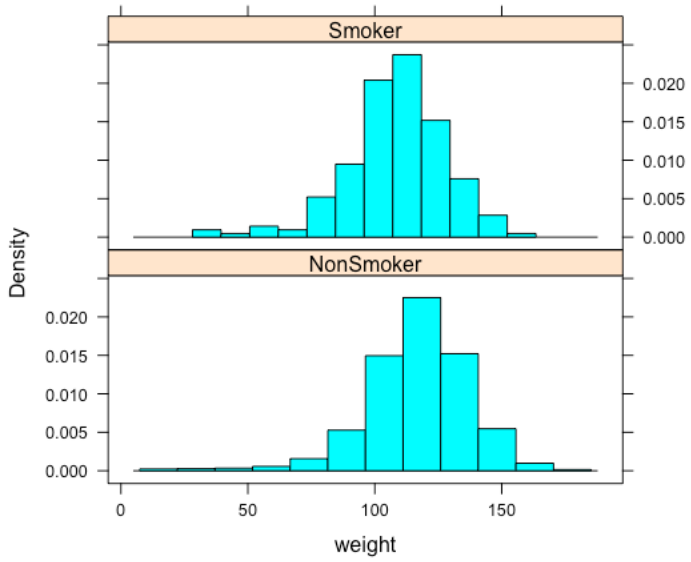

**boxplot(NCbirths[,c('Mage','Fage')])**




The father's age on average (median) is higher than the mother. There are also more upper outliers for the father than the mother. Fathers tend to be older than mothers for our sample.

#4

**histogram(~ weight | Habit, data = NCbirths, layout = c(1, 2))**




On average, babies from mothers who are not smokers weigh more on average. There are more babies with low weights (~50 oz) for mothers who smoke.

Section 4

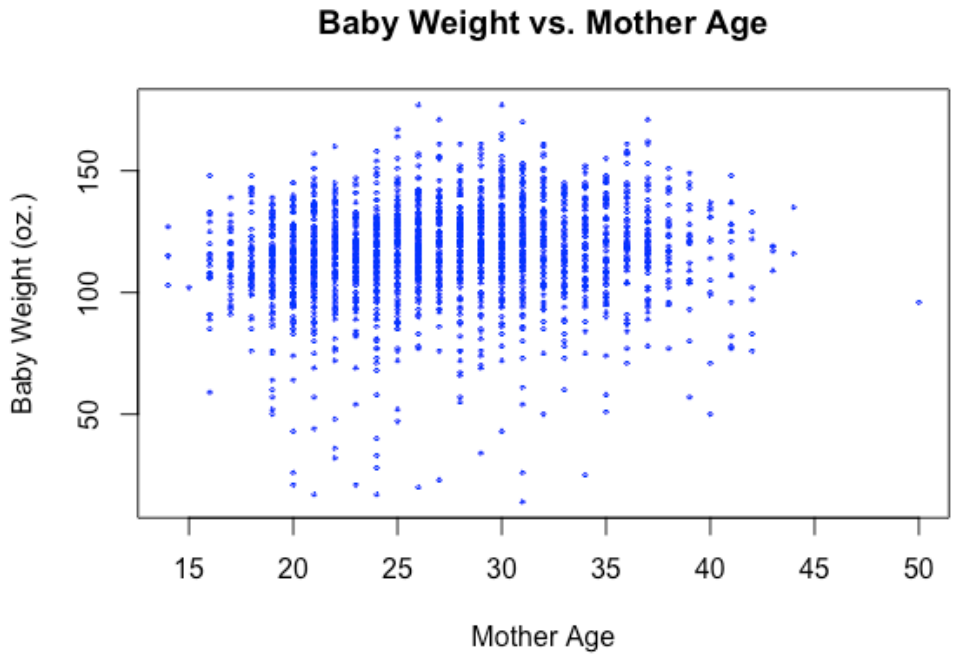
**tally(~BirthComp | Habit, data = NCbirths, format = "proportion")**

| | Habit | |
|---|---|---|
| BirthComp | NonSmoker | Smoker |
| At Least One | 0.05152355 | 0.07486631 |
| None | 0.94847645 | 0.92513369 |

We see that babies that have moms that are smokers are more likely to have at least one birth complication. This is significant because it is about a 40% increase in birth complications.

Section 5

```
plot(NCbirths$weight ~ NCbirths$Mage, col = "blue", cex = 0.25, pch = 5,
    xlab = "Mother Age", ylab = "Baby Weight (oz.)",
    main = "Baby Weight vs. Mother Age")
```



Section 6

```
a <- read.table("http://www.stat.ucla.edu/~nchristo/statistics12/ozone.txt",
          header=TRUE)

library(maps)

AQI_colors <- c("green", "yellow", "blue", "pink", "red")
AQI_levels <- cut(a$o3, c(0, 0.06, 0.075, 0.104, 0.115, 0.374))

plot(a$x, a$y, xlim=c(-125,-114),ylim=c(32,43), xlab="Longitude",
   ylab="Latitude", main="California Ozone Bubble Plot", "n")

map("county", "ca",add=TRUE)

points(a$x,a$y, cex=a$o3/mean(a$o3),
     col=AQI_colors[as.numeric(AQI_levels)], pch=17)
```