HW5 STAT 5014

Shane Bookhultz

October 4, 2017

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:data.table':
##
##     between, first, last

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

## Warning: package 'downloader' was built under R version 3.4.2

## Warning: package 'fiftystater' was built under R version 3.4.2
```

Problem 3

What goes into making a good figure? *Easy to comprehend* Contains important information *Makes a meaningful connection* Able to be understood from all backgrounds

Problem 4

a. This function successes makes a proportion of success from a vector of 1's and 0's and converts it to a proportion.

b. Create a matrix to simulate 10 flips of a coin with varying degrees of "fairness"

c. Use the function in conjunction with apply to compute successes by column and then row

What I notice here is that the column probabilities are all the same decimal value, but the row probabilities are all either 1's or 0's.

d. Fix the matrix by creating a function whose input is a probability and output is a vector whose elements are the outcomes of 10 flips of a coin.

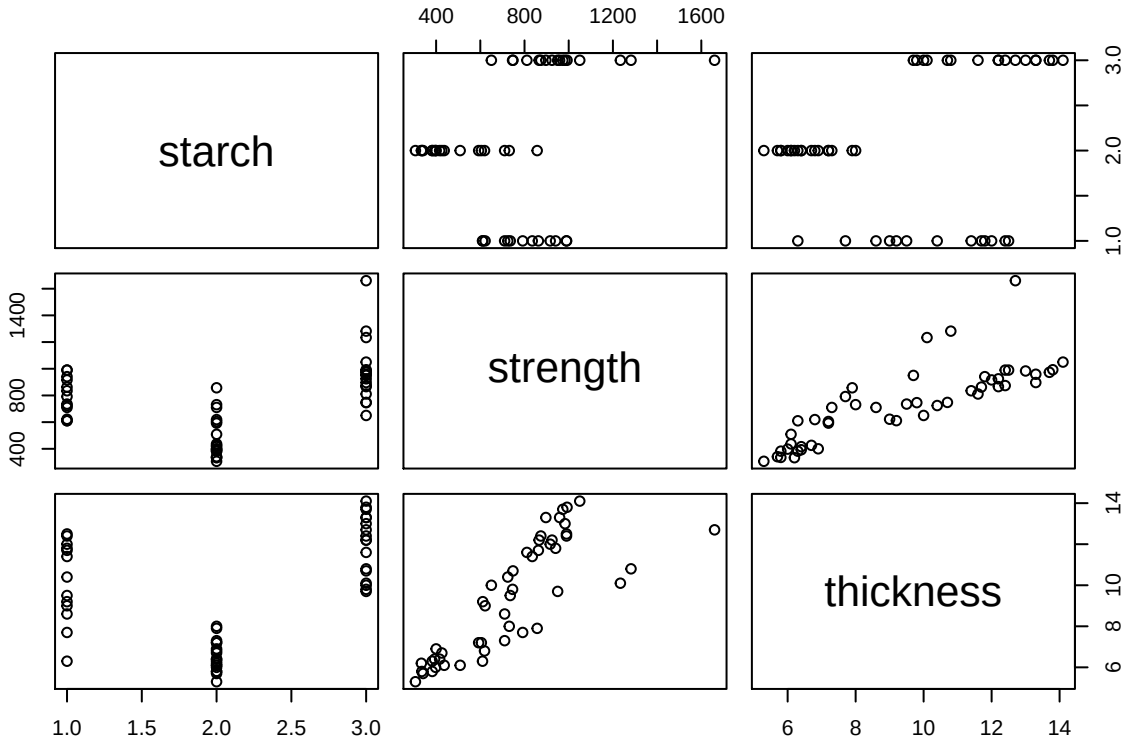
Problem 5

starch	strength	thickness
CA	791.7	7.7
CA	610.0	6.3
CA	710.0	8.6
CA	940.7	11.8
CA	990.0	12.4
CA	916.2	12.0

starch	strength	thickness
CA	835.0	11.4
CA	724.3	10.4
CA	611.1	9.2
CA	621.7	9.0
CA	735.4	9.5
CA	990.0	12.5
CA	862.7	11.7
CO	731.0	8.0
CO	710.0	7.3
CO	604.7	7.2
CO	508.8	6.1
CO	393.0	6.4
CO	416.0	6.4
CO	400.0	6.9
CO	335.6	5.8
CO	306.4	5.3
CO	426.0	6.7
CO	382.5	5.8
CO	340.8	5.7
CO	436.7	6.1
CO	333.3	6.2
CO	382.3	6.3
CO	397.7	6.0
CO	619.1	6.8
CO	857.3	7.9
CO	592.5	7.2
PO	983.3	13.0
PO	958.8	13.3
PO	747.8	10.7
PO	866.0	12.2
PO	810.8	11.6
PO	950.0	9.7
PO	1282.0	10.8
PO	1233.8	10.1
PO	1660.0	12.7
PO	746.0	9.8
PO	650.0	10.0
PO	992.5	13.8
PO	896.7	13.3
PO	873.9	12.4
PO	924.4	12.2
PO	1050.0	14.1
PO	973.3	13.7

```
## Warning in mean.default(StarchData[, ][2]): argument is not numeric or
## logical: returning NA
```

Starch	StrengthMean	ThicknessMean
CA	795.2923	10.192308
CO	482.8263	6.531579
PO	976.4294	11.964706

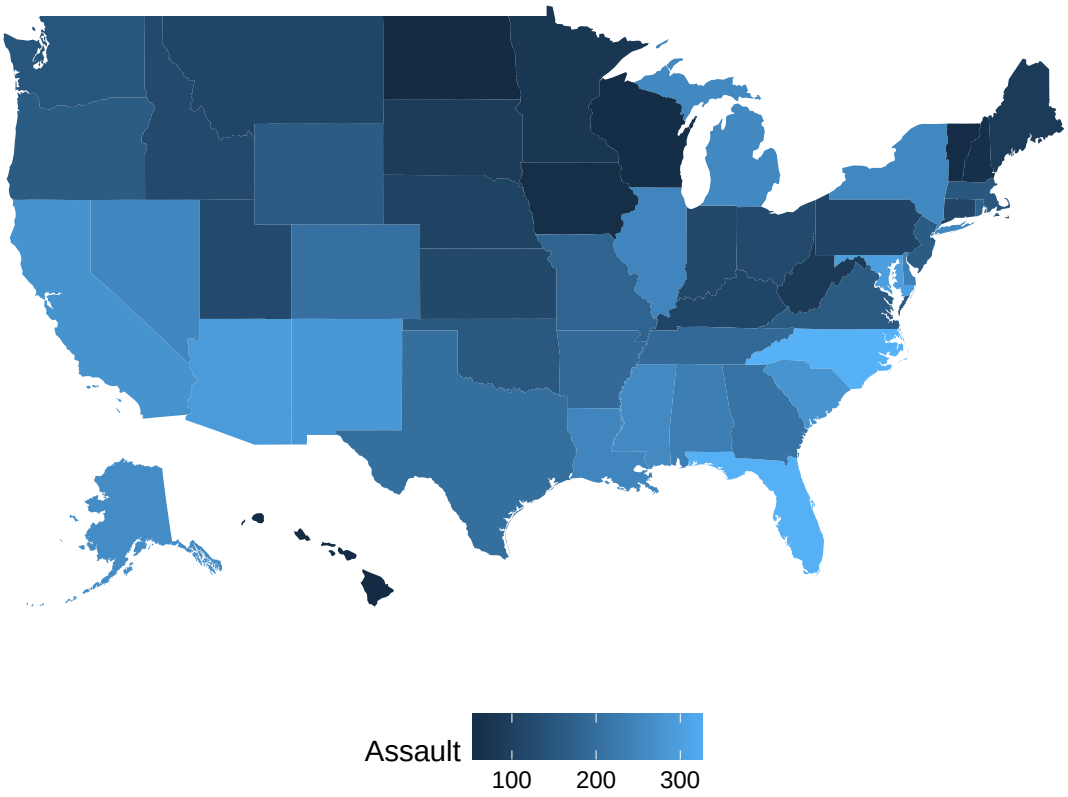



```
##
## Call:
## lm(formula = StarchData$strength ~ StarchData$starch + StarchData$thickness)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -203.63  -99.45  -57.84   56.72  637.61
##
## Coefficients:
##                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)             158.26     179.78   0.880 0.383360
## StarchData$starchCO     -83.67      86.10  -0.972 0.336351
## StarchData$starchPO      70.36      67.78   1.038 0.304795
## StarchData$thickness     62.50      17.06   3.664 0.000653 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 164.7 on 45 degrees of freedom
## Multiple R-squared:  0.6815, Adjusted R-squared:  0.6602
## F-statistic: 32.09 on 3 and 45 DF,  p-value: 3.001e-11
```

Problem 6

StateName	Freq
Alabama	838

StateName	Freq
Alaska	273
Arizona	532
Arkansas	709
California	2651
Colorado	659
Connecticut	438
Delaware	98
District of Columbia	284
Florida	1487
Georgia	972
Hawaii	139
Idaho	325
Illinois	1587
Indiana	989
Iowa	1060
Kansas	756
Kentucky	961
Louisiana	725
Maine	489
Maryland	619
Massachusetts	703
Michigan	1170
Minnesota	1031
Mississippi	533
Missouri	1170
Montana	405
Nebraska	620
Nevada	253
New Hampshire	284
New Jersey	733
New Mexico	426
New York	2207
North Carolina	1090
North Dakota	407
Ohio	1446
Oklahoma	774
Oregon	484
Pennsylvania	2208
Rhode Island	91
South Carolina	539
South Dakota	394
Tennessee	795
Texas	2650
Utah	344
Vermont	309
Virginia	1238
Washington	732
West Virginia	859
Wisconsin	898
Wyoming	195


Assault
100
200
300