

# Homework 5

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```
library(tidyr)
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
library(downloader)

## Warning: package 'downloader' was built under R version 3.4.2
library(data.table)

##
## Attaching package: 'data.table'
## The following objects are masked from 'package:dplyr':
##
##   between, first, last
library(readr)

## Warning: package 'readr' was built under R version 3.4.2
library(ggplot2)
library(fiftystater)

## Warning: package 'fiftystater' was built under R version 3.4.2
library(maps)

## Warning: package 'maps' was built under R version 3.4.2
library(mapdata)

## Warning: package 'mapdata' was built under R version 3.4.2
suppressMessages(library(tidyr))
suppressMessages(library(dplyr))
suppressMessages(library(downloader))
suppressMessages(library(data.table))
suppressMessages(library(readr))
suppressMessages(library(ggplot2))
suppressMessages(library(fiftystater))
suppressMessages(library(maps))
suppressMessages(library(mapdata))
```

### Problem 3

A good figure depends on whether or not it looks exactly the way it looks to others who see it, the way the researcher wanted them to visualize it. The objective for making the figure should be clear, its axes clearly labeled, while also being able to give the views an intuitive understanding of the data and convey the researcher's ideas. A good figure represents the underlying data in the "quickest and dirtiest" form.

### Problem 4

Part (a)

#### Proportion of successes

Part (b)

#### Simulation of 10 coin flips

```
set.seed(23456)
P4b_data <- matrix(rbinom(10, 1, prob = (30:40)/100), nrow = 10, ncol = 10)
```

Part (c)

#### Proportion of success in P4b\_\_data

*Comment:* We observe the same proportion of success for coin flips across both columns and rows. This is because the data follows Binomial Distribution.

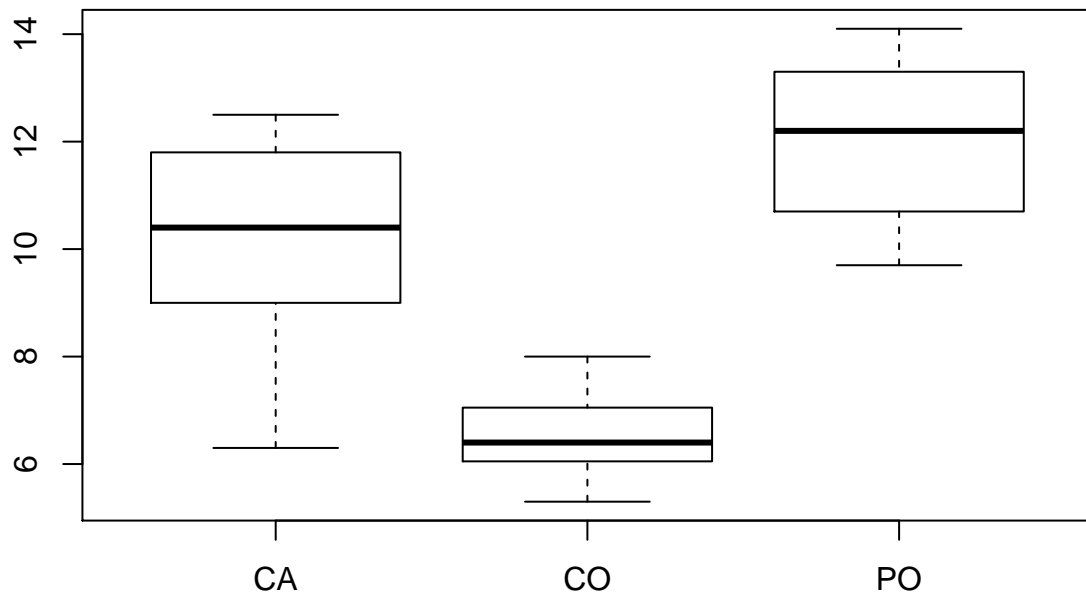
Part (d)

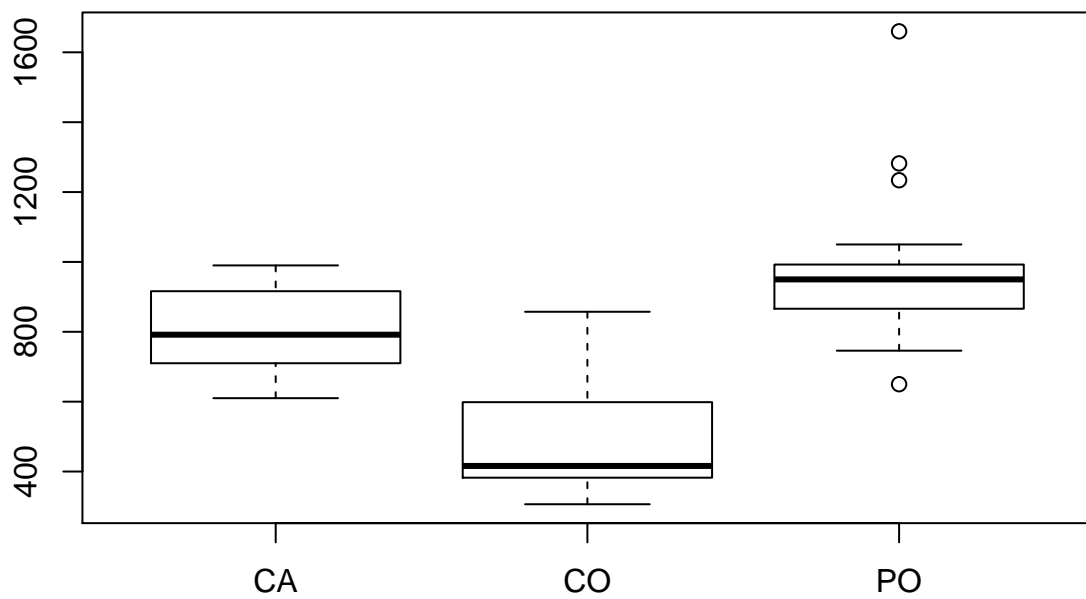
Matrix whose input is a probability function that gives a vector whose elements are 10 flips of a coin as output

##		[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]
##	[1,]	0	0	1	0	0	0	0	1	0	0	0
##	[2,]	1	0	0	0	0	0	1	0	1	1	0
##	[3,]	0	0	0	0	1	1	1	1	1	0	1
##	[4,]	1	1	1	0	0	1	0	0	0	0	1
##	[5,]	1	0	0	0	0	1	1	1	0	0	0
##	[6,]	0	1	1	0	0	1	0	1	0	0	0
##	[7,]	0	0	1	0	0	0	0	0	1	0	0
##	[8,]	0	0	0	0	0	0	0	1	1	1	0
##	[9,]	1	0	0	1	0	0	0	1	1	0	0
##	[10,]	0	1	1	0	0	0	0	0	1	0	1

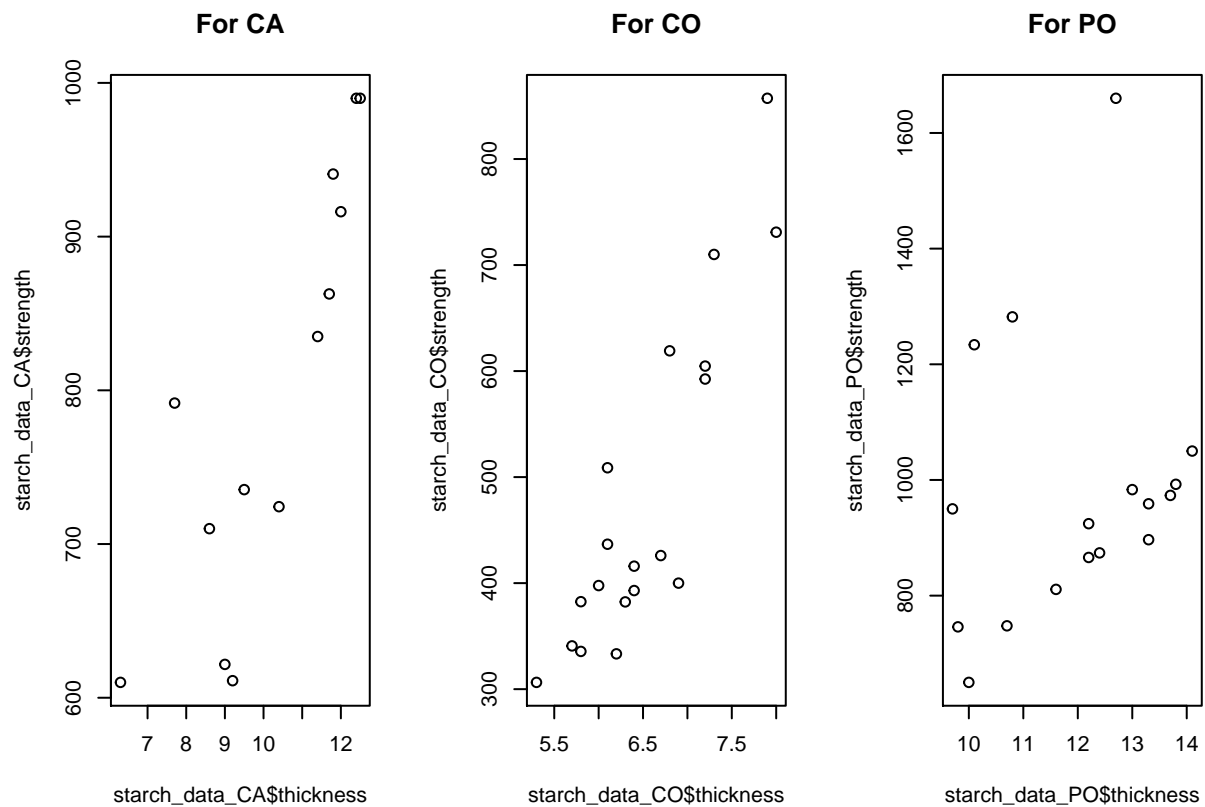
## Problem 5

```
##      starch      strength      thickness
## Length:49      Min.   : 306.4      Min.   : 5.300
## Class :character 1st Qu.: 508.8      1st Qu.: 6.700
## Mode  :character Median : 735.4      Median : 9.500
##                Mean   : 737.0      Mean   : 9.388
##                3rd Qu.: 924.4      3rd Qu.:12.000
##                Max.   :1660.0      Max.   :14.100
```





## [1] 0.8164981



## Problem 6

Part (a)

Get and import a database of US cities and states

Part (b)

```
##      State Number of Cities
## 1      AK           229
## 2      AL           578
## 3      AR           605
## 4      AZ           264
## 5      CA          1239
## 6      CO           400
## 7      CT           269
## 8      DC            3
## 9      DE            57
## 10     FL           524
## 11     GA           628
## 12     HI            92
## 13     IA           937
## 14     ID           266
## 15     IL          1287
```

## 16	IN	738
## 17	KS	634
## 18	KY	803
## 19	LA	478
## 20	MA	511
## 21	MD	430
## 22	ME	461
## 23	MI	885
## 24	MN	810
## 25	MO	942
## 26	MS	440
## 27	MT	360
## 28	NC	762
## 29	ND	373
## 30	NE	528
## 31	NH	255
## 32	NJ	579
## 33	NM	346
## 34	NV	99
## 35	NY	1612
## 36	OH	1069
## 37	OK	585
## 38	OR	379
## 39	PA	1801
## 40	PR	99
## 41	RI	70
## 42	SC	377
## 43	SD	364
## 44	TN	548
## 45	TX	1466
## 46	UT	250
## 47	VA	839
## 48	VT	288
## 49	WA	493
## 50	WI	753
## 51	WV	753
## 52	WY	176

Part (c)

Sorry, I didn't finish this question owing to my regression test. :(

Part (d)

Map!!