# Homework #1

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**"Adjust" the dice or play with the random number generator. Can you get them to roll a 6 more or less often than would be expected? How would you know - what is "more often"? Can you write some code in R that will simulate a fair roll?**

```
I think if I adjusted the dice and tried rolling it, it wouldn't have an effect on whether the dice woul
```

**Can you write some code in R that will simulate a fair roll?**

```
dice = c("1", "2", "3", "4", "5", "6")
sample(x = dice, size = 20, replace = TRUE)
```

**Replicate the commands given in the lecture notes R Basics for Lecture 1 to do some simple stats on the PUMS-NY data. Those notes request that you find average ages for men and women after accounting for the top-coding. Tell me something else interesting, that you learned from the data, for example about educational attainments in different neighborhoods in the city. Are there surprises for you?**

```
The data has a lot of information, but something that I found interesting was the relation between diffe
```

load("acs2017_ny_data.RData")

```
acs2017_ny[1:10,1:7]
```

summary(acs2017_ny)

```
print(NN_obs <- length(AGE))
```

summary(AGE[female == 1])

```
summary(AGE[!female])
```

mean(AGE[female == 1])

```
sd(AGE[female == 1])
```

mean(AGE[!female])

```
sd(AGE[!female])
```

## SP500 Returns

```
Date     Open     High     Low        Close    Adj Close   Volume
1/2/182683.729982695.8898932682.3601072695.8100592695.8100593367250000
1/3/182697.8500982714.3701172697.770022713.0600592713.0600593538660000
1/4/182719.3100592729.2900392719.0700682723.989992723.989993695260000
1/5/182731.3300782743.4499512727.9199222743.1499022743.1499023236620000
1/8/182742.6699222748.510012737.6000982747.7099612747.7099613242650000
1/9/182751.1499022759.1398932747.8601072751.2900392751.2900393453480000
1/10/182745.5500492750.8000492736.0600592748.229982748.229983576350000
1/11/182752.9699712767.5600592752.7800292767.5600592767.5600593641320000
1/12/182770.1799322787.8500982769.6398932786.239992786.239993573970000
1/16/182798.9599612807.5400392768.6398932776.4199222776.4199224325970000
1/17/182784.989992807.0400392778.3798832802.5600592802.5600593778050000
1/18/182802.3999022805.8300782792.5600592798.0300292798.0300293681470000
1/19/182802.6000982810.3300782798.0800782810.3000492810.3000493639430000
1/22/182809.1599122833.0300292808.1201172832.9699712832.9699713471780000
1/23/182835.0500492842.239992830.5900882839.1298832839.1298833519650000
1/24/182845.4199222852.9699712824.8100592837.5400392837.5400394014070000
1/25/182846.239992848.5600592830.9399412839.25    2839.25    3835150000
1/26/182847.479982872.8701172846.1799322872.8701172872.8701173443230000
1/29/182867.229982870.6201172851.479982853.5300292853.5300293573830000
1/30/182832.739992837.75    2818.270022822.4299322822.429932 3990650000
1/31/182832.4099122839.260012813.0400392823.8100592823.8100594261280000
2/1/182816.4499512835.9599612812.6999512821.979982821.979983938450000
```

Daily Return Date -0.004501227 1/2/18 -0.005637808 1/3/18 -0.001720999 1/4/18 -0.004327497 1/5/18 -0.00183764 1/8/18 -5.09376E-05 1/9/18 -0.0009761 1/10/18 -0.005299763 1/11/18 -0.005797478 1/12/18 0.008053005 1/16/18 -0.006308845 1/17/18 0.001559332 1/18/18 -0.002747431 1/19/18 -0.008475865 1/22/18 -0.001439069 1/23/18 0.002769322 1/24/18 0.002455868 1/25/18 -0.008916704 1/26/18 0.004778114 1/29/18 0.003639606 1/30/18 0.003036232 1/31/18 -0.001963475 2/1/18

## What is the mean return on days when the previous day's return was positive? When the previous 2 days were positive? Negative?

The mean return on days when the previous day's return was positive is -0.006308845 on January 17. The mean return when the previous 2 days were positive was 0.001559332 on January 18.

```
## Read about "hot hands fallacy" and tell if you think that helps investment strategy.
```

Hot hands fallacy results when individuals base their expectations and predictions about an event based on an event just before that. Although, data shows that this usually leads people to make false assumptions, this is very common. I think hot hands fallacy doesn't help investment because investors must assess markets using base rate information while considering the historical data and analysis. I think hot hands fallacy would lead to investors making erroneous investments. "'