
title: "Week 4 Project, Part 1 -- Simulation"

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output:

pdf_document: default

html_document: default

PART 0: SETUP

echo settings for embedding code

```
```${r setup, include=FALSE}
```

```
knitr::opts_chunk$set(echo = TRUE)
```

```
library(knitr)
```

```
library(rmarkdown)
```

```
````
```

Setting Directory

```
```${r dir}
```

```
getwd()
```

```
setwd("C:/Dhruv/misc/data/R_6_statistical_inference/wk4_power_sampling")
```

```
````
```

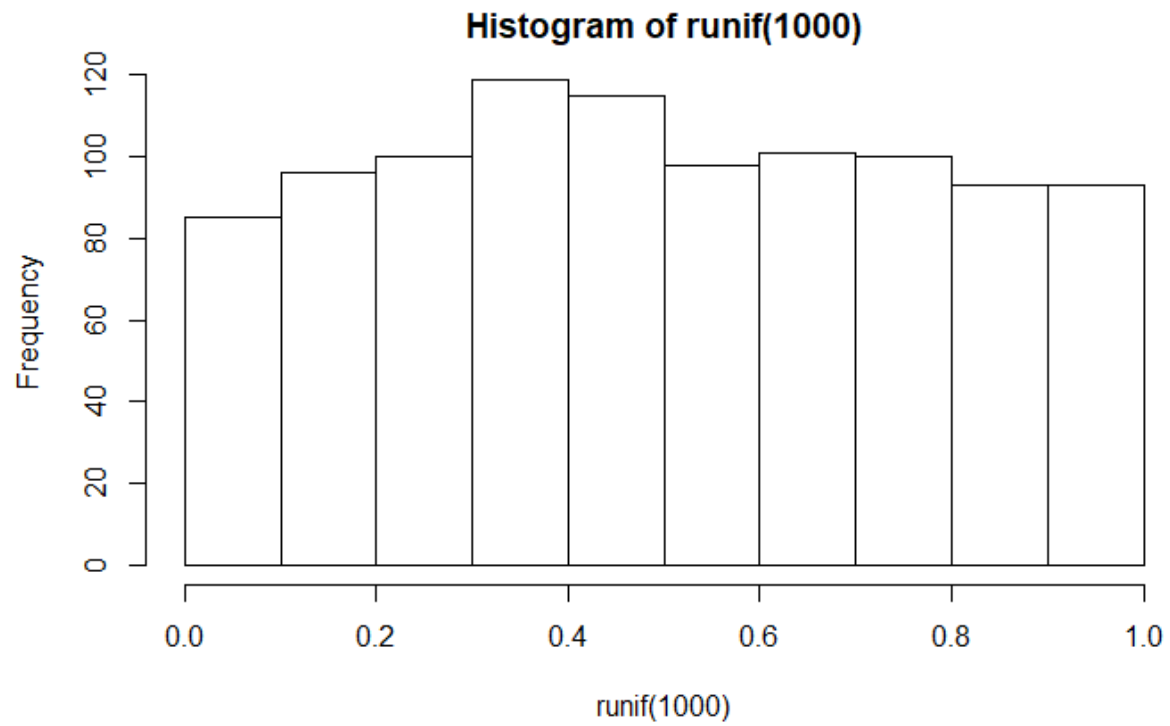
PART I: Simulation Exercise

Using starter code to motivate simulation

```
``{r random uniforms}
```

```
hist(runif(1000))
```

```
``
```



1000 avgs of 40 random unifs

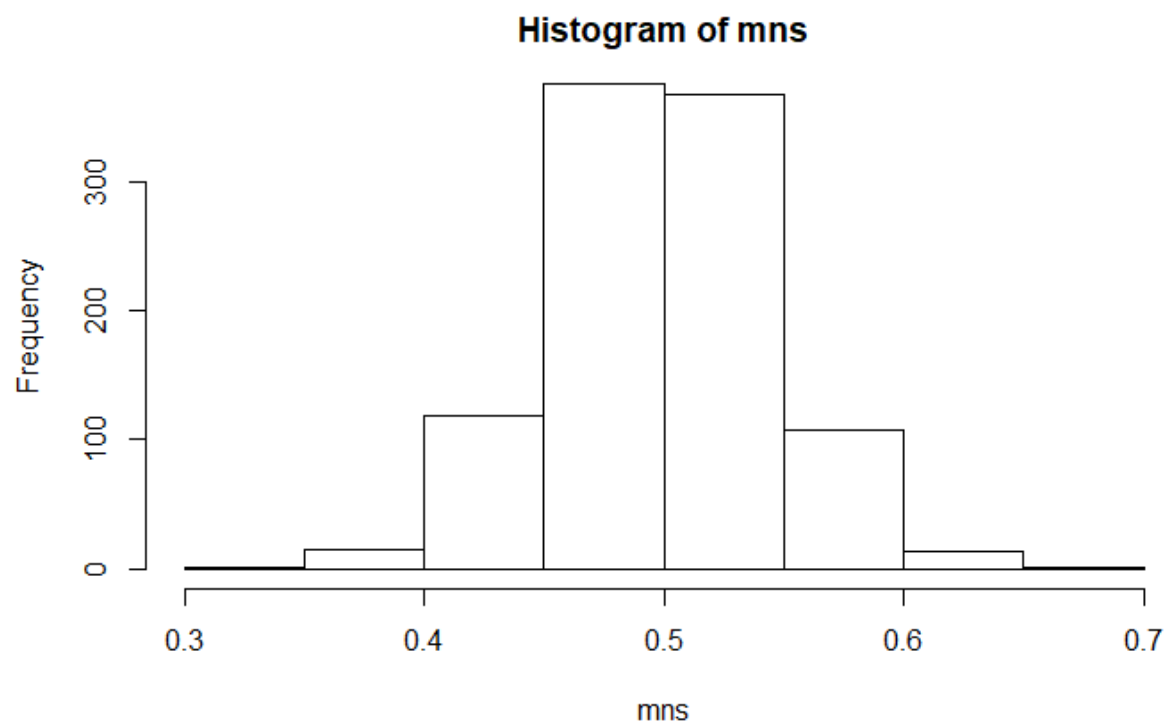
```
```{r random uniform averages}
```

```
mns = NULL
```

```
for (i in 1 : 1000) mns = c(mns, mean(runif(40)))
```

```
hist(mns)
```

```
```
```



1. Simulating mean:

```
```{r mean sim}
```

```
lambda = 0.2
```

```
mean of one iteration/simulation
```

```
mean(rexp(40,0.2))
```

```
mean of 1000 iterations / simulations
```

```
mean_simulation = NULL
```

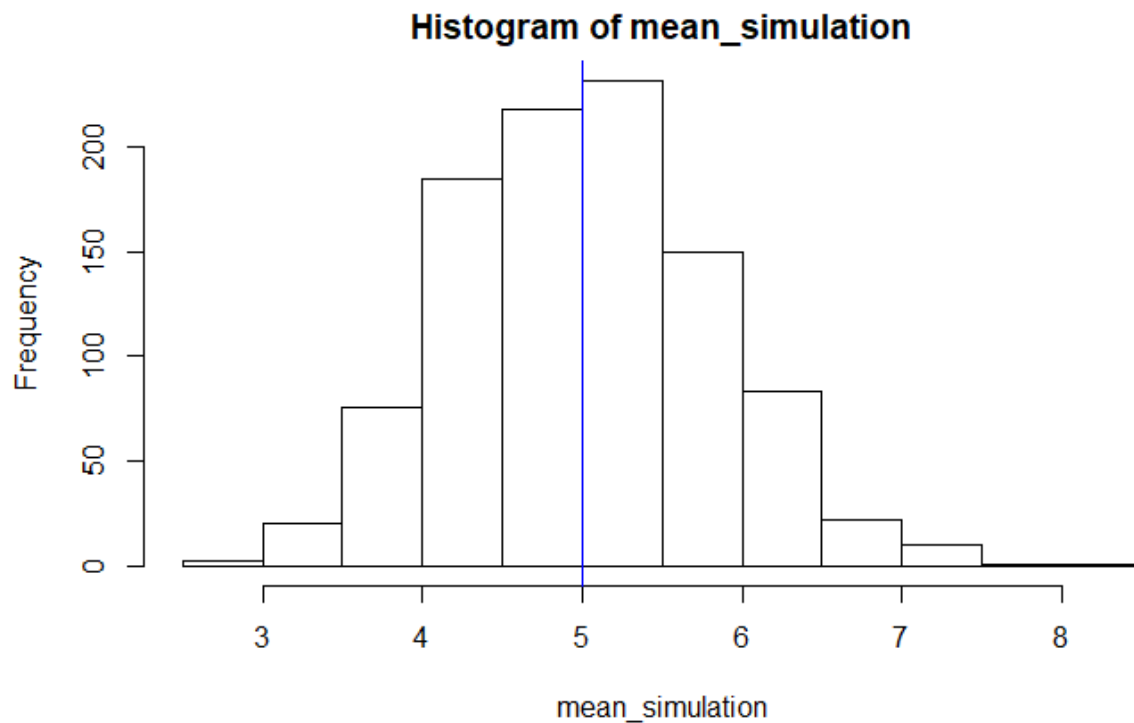
```
for (i in 1 : 1000) mean_simulation = c(mean_simulation, mean(rexp(40, 0.2)))
```

```
{hist(mean_simulation)
```

```
abline(v=mean(mean_simulation), col = "red")
```

```
abline(v=1/0.2, col = "blue")}
```

```
```
```



2. Simulating standard deviation:

```
```{r standard deviation simulation}
```

```
lambda = 0.2
```

```
std dev of one iteration/simulation
```

```
sd(rexp(40,0.2))
```

```
std dev of 1000 iterations / simulations
```

```
stdev_simulation = NULL
```

```
for (i in 1 : 1000) stdev_simulation = c(stdev_simulation, sd(rexp(40, 0.2)))
```

```
{hist(stdev_simulation)
```

```
abline(v=sd(stdev_simulation), col = "red")
```

```
abline(v=1/0.2, col = "blue")}
```

# the returned standard deviation from the simulations (~1) is much smaller than the theorized standard deviation (~5)

```
...
```

