

# Homework 1

Due Wednesday Sep 2

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8/26/2020

## Problem 1

R is an open source, community built, programming platform. Not only is there a plethora of useful web based resources, there also exists in-R tutorials. As per the instructions, I did both of the Primers labeled as The Basics on Rstudio.cloud.

## Problem 2

After having the R environment setup, with the help of a basic understanding of R, I created this Markdown, saved the file to the directory containing the *README.md* file.

### Part A

Although I had a brief experience with R before, I have not studied it from the basics properly and therefore, had problems understanding codes during certain instances in the past. With this class, I hope to have a more innate understanding of the language and to have a certain level of comfort using it in the future. Desired learning objectives:

1. Better command and understanding of R
2. Better understanding of statistical simulations in R
3. Hopefully, learn a bit about SAS

### Part B

- (1) *The density of the sum of two normals:*

$$If[Re[z] < 0, \frac{e^{-\frac{z^2}{4}}}{2\pi}, \int_{-\infty}^{\infty} \frac{E^{-\frac{y^2}{2} - \frac{1}{2}(-y+z)^2}}{2\pi} dy]$$

- (2) *The density of the sum of two Cauchys:*

$$\frac{2}{\pi(-2I + z)(2I + z)}$$

- (3) *The density of the sum of two t's with 5 degrees of freedom:*

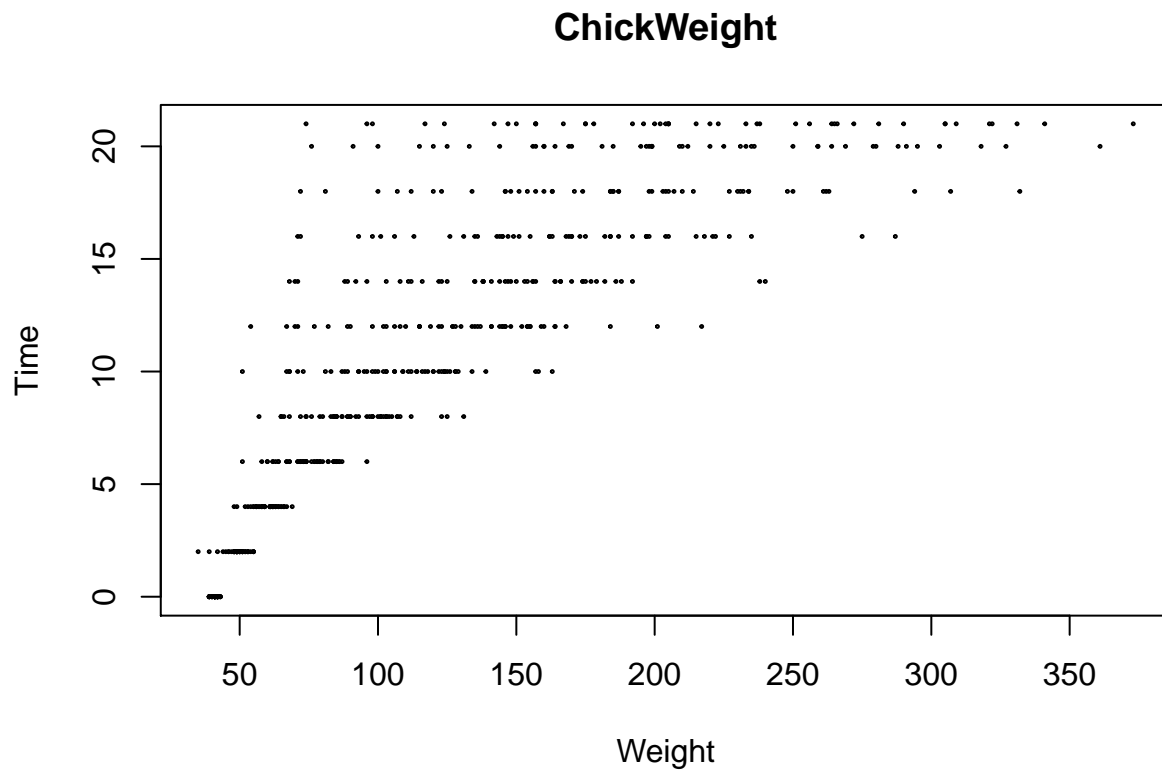
$$\frac{400\sqrt{5}(8400 + 120z^2 + z^4)}{3\pi(20 + z^2)^5}$$

## Problem 3

## Problem 4

Following is a basic scatter plot:

```
plot(ChickWeight$weight, ChickWeight$Time, cex = 0.2, xlab = "Weight", ylab = "Time",  
     main = "ChickWeight")
```



Following is a histogram:

```
hist(ChickWeight$weight, xlab = "Weight", ylab = "Frequency",  
     main = "ChickWeight")
```

