BSTT562 Project I

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```r
rm(list = ls())
library(ggplot2)
library(data.table)

# read data from github

data <- read.csv('https://raw.githubusercontent.com/yuebanfengqing/BSTT-562/master/data.csv', sep = ','

## transform data from wide to long

zero <- data[,3]
twenty <- data[,4]
hundred <- data[,5]

con1 <- cbind(data[,1:2], zero)
con1$Concentration <- rep(0, 25)
colnames(con1)[3] <- 'Real'

con2 <- cbind(data[,1:2], twenty)
con2$Concentration <- rep(20, 25)
colnames(con2)[3] <- 'Real'

con3 <- cbind(data[,1:2], hundred)
con3$Concentration <- rep(100, 25)
colnames(con3)[3] <- 'Real'

p1.data <- rbind(con1, con2, con3)
head(p1.data)
```

```
##   Lab Rep  Real Concentration
## 1   1   1 -3.00             0
## 2   1   2  4.00             0
## 3   1   3 -4.00             0
## 4   1   4  3.00             0
## 5   1   5  3.10             0
## 6   2   1 -0.06             0
```

Abstract

In this project, we want to reproduce the results presented in Table 3 Interlaboratory Data for Cadmium from Bhaumik and Gibbons (2005)

Introduction

A key characteristics of the data is its heteroscedasticity.

Reference

Bhaumik, Dulal K, and Robert D Gibbons. 2005. "Confidence Regions for Random-Effects Calibration Curves with Heteroscedastic Errors." *Technometrics* 47 (2). Informa UK Limited: 223–31. doi:10.1198/004017005000000021.