STAT_37810_HW2

Boxin

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Some preparation work before test

```
source("E:/function.R")

trueA <- 5
trueB <- 0
trueSd <- 10
sampleSize <- 31

# create independent x-values
x <- (-(sampleSize-1)/2):((sampleSize-1)/2)
# create dependent values according to ax + b + N(0,sd)
y <-  trueA * x + trueB + rnorm(n=sampleSize,mean=0,sd=trueSd)
```

Compare different iteration times

```
# comparison between different iteration numbers
iteration.numbers <- c(1000, 10000, 100000)
compare_outcomes(iteration.numbers)
```

```
##                 iteration: 1000       iteration: 10000
## loop  1  mean: 5.313 std: 0.892  mean: 5.098 std: 0.39
## loop  2  mean: 5.018 std: 0.315  mean: 5.043 std: 0.24
## loop  3  mean: 5.017 std: 0.333  mean: 5.06 std: 0.219
## loop  4  mean: 4.556 std: 1.201 mean: 5.013 std: 0.435
## loop  5  mean: 5.143 std: 0.307 mean: 5.084 std: 0.219
## loop  6  mean: 5.048 std: 0.275 mean: 5.065 std: 0.208
## loop  7  mean: 4.937 std: 0.551 mean: 5.074 std: 0.238
## loop  8  mean: 5.282 std: 0.626 mean: 5.072 std: 0.261
## loop  9  mean: 5.343 std: 0.481  mean: 5.07 std: 0.246
## loop  10 mean: 4.794 std: 0.974 mean: 5.058 std: 0.438
##                iteration: 1e+05
## loop  1  mean: 5.073 std: 0.237
## loop  2   mean: 5.07 std: 0.222
## loop  3  mean: 5.076 std: 0.214
## loop  4   mean: 5.07 std: 0.237
## loop  5  mean: 5.073 std: 0.211
## loop  6  mean: 5.073 std: 0.208
## loop  7  mean: 5.071 std: 0.213
## loop  8   mean: 5.076 std: 0.22
## loop  9  mean: 5.071 std: 0.213
## loop  10 mean: 5.068 std: 0.236
```