ST2132 Semester 1 AY2022/2023

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| --- | --- | --- | --- |
| Number | A0239079R | | |
| Name | Claudeon Reinard Susanto | | |
|  | Estimate | SE | Bias |
|  | 8.1606017 | 0.3873534 | 0.0255312 |
|  | 10.1566081 | 0.4955491 | 0.042879 |

library(tidyverse)

data <- read.csv("data2210")

x <- data %>%

filter(V1 == "A0239079R") %>%

select(starts\_with("X")) %>%

apply(1, function(x) x)

# estimate alpha given vector using MOM

estimate\_alpha <- function(x) {

mean(x)^2/sd(x)^2

}

# estimate lambda given vector using MOM

estimate\_lambda <- function(x) {

mean(x)/sd(x)^2

}

alpha\_est <- estimate\_alpha(x)

lambda\_est <- estimate\_lambda(x)

x\_star <- rgamma(1000\*1000, shape=alpha\_est, rate=lambda\_est)

x\_mat <- matrix(x\_star, nrow=1000)

# estimations for parameters of each row

alpha\_star <- apply(x\_mat, 1, estimate\_alpha)

lambda\_star <- apply(x\_mat, 1, estimate\_lambda)

se\_alpha <- sd(alpha\_star)

se\_lambda <- sd(lambda\_star)

E\_alpha\_star <- mean(alpha\_star)

bias\_alpha <- E\_alpha\_star - alpha\_est

E\_lambda\_star <- mean(lambda\_star)

bias\_lambda <- E\_lambda\_star - lambda\_est

alpha\_final <- alpha\_est - bias\_alpha

lambda\_final <- lambda\_est - bias\_lambda