ST2132 Semester 1 AY2022/2023

Number	A0239079R		
Name	Claudeon Reinard Susanto		
	Estimate	SE	Bias
α	8.1606017	0.3873534	0.0255312
λ	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
```