```
library("Rcpp")
library("ggplot2")
library("stats")
library("forecast")

path<-file.path("C:","Users","User","Downloads", fsep="\\")
setwd(path)
dataset.raw <- read.csv("DataInflation.csv")
dataset.ts = ts(data=dataset.raw[,2], start=c(2016,7), frequency=12)


################ Question 1 ####################

plot(dataset.ts,xlab="Time (Year) ", ylab="Inflation Rate (%) ",main="Monthly
Inflation Rate (%) from July 2016")
abline(h=mean(dataset.ts), col="blue", lty=2)
mean(dataset.ts)

dataset_diff <- diff(dataset.ts)
plot(dataset_diff, xlab = "Time", ylab="Differenced Inflation Rate")
abline(h=mean(dataset_diff), col="red", lty=2)
mean(dataset_diff)


################ Question 2 ######################
k<-20
#ACF & PACF original data
par(mfrow=c(1,2))
acf(dataset.ts, lag.max =k, main = "ACF of Original Inflation Rate Data",
      xlab = "Lag", ylab = "ACG")
pacf(dataset.ts, lag.max = k, main = "PACF of Original Inflation Rate Data",
    xlab = "Lag"  , ylab = "PACF")

pacf(dataset.ts, lag.max = k, main = "PACF of Original Inflation Rate Data",
     xlab = "Lag", ylab = "PACF", xlim = c(0, k))

#ACF & PACF first diffrenced data
acf(dataset_diff, lag.max = k, main = "ACF of First-Differenced Inflation Data",
    xlab = "Lag", ylab="ACF") #MA

pacf(dataset_diff, lag.max = k, main = "PACF of First-Differenced Inflation Data",
     xlab = "Lag", ylab = "PACF") #AR

########### Question 4 ################################
#ARIMA(0,1,1)

arima_model<- Arima(dataset.ts , c(0,1,1), include.drift = T)

summary(arima_model)

################ Question 5 ########################
fit_ARIMA<- Arima(dataset.ts, c(2,1,5))
summary(fit_ARIMA)

################## Question 6 ########################
# Ensure we only have one plot on the screen
par(mfrow=c(1,1))

# Display the coefficients of the ARIMA(0,1,1) with drift model
```

```
coef <- as.array(arima_model$coef)
print(coef)

forecast_est <- forecast(arima_model, h=12)
print(forecast_est)

plot(forecast_est, xlab="Time (Year)", ylab="Inflation Rate (%)" ,main="Future
Inflation Rates for the Next 12 Months")
lines(dataset.ts, col = "black")

legend(x = "topleft", legend = c("Original Data", "Forecasted Mean"),
       lty = 1, lwd = 2, col = c("black", "blue"))

forecast_est$mean
```