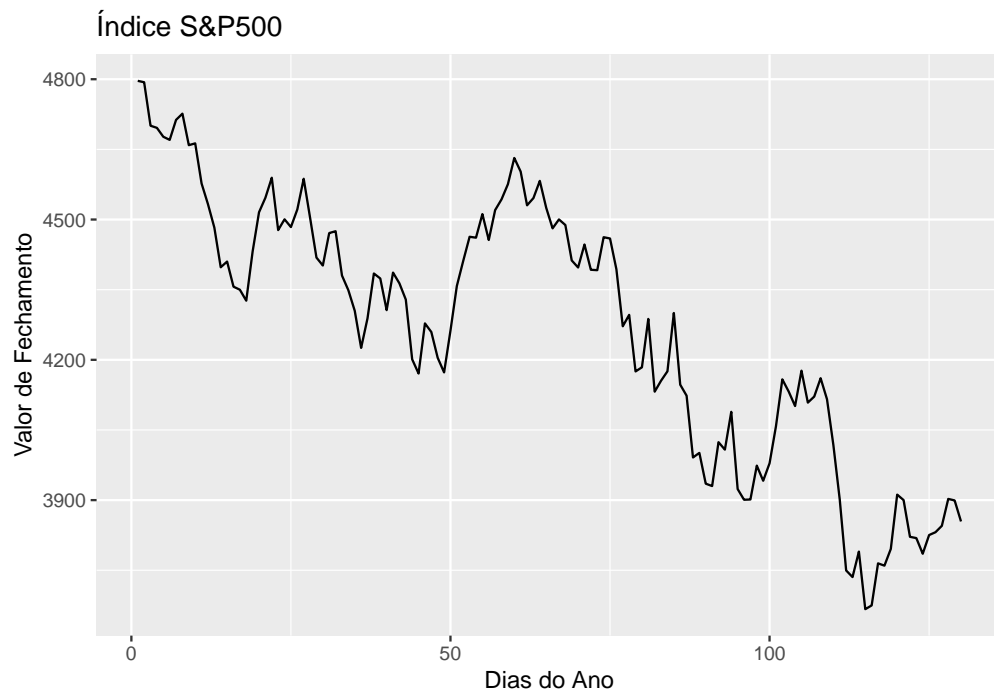


# Prova GED-17

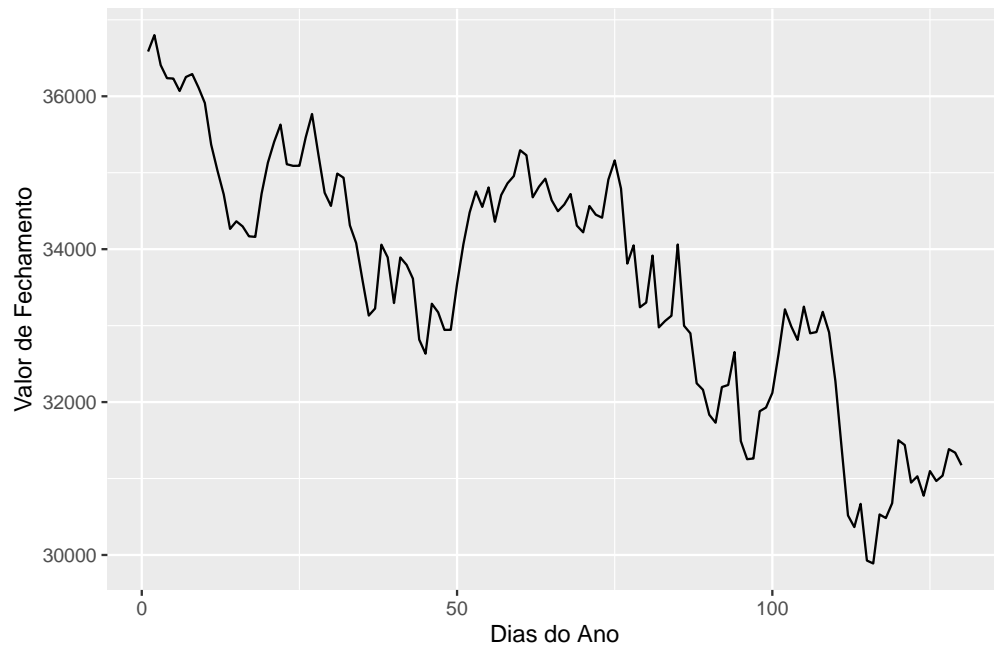
Arthur Stevenson

2022-07-05

Inicialmente, são fornecidas várias séries temporais, representando os valores de diferentes índices, como o Bovespa, e a cotação de diferentes moedas, como o Dólar. Assim, tratando dos valores de fechamento para essas séries, podemos gerar os seus respectivos plots.

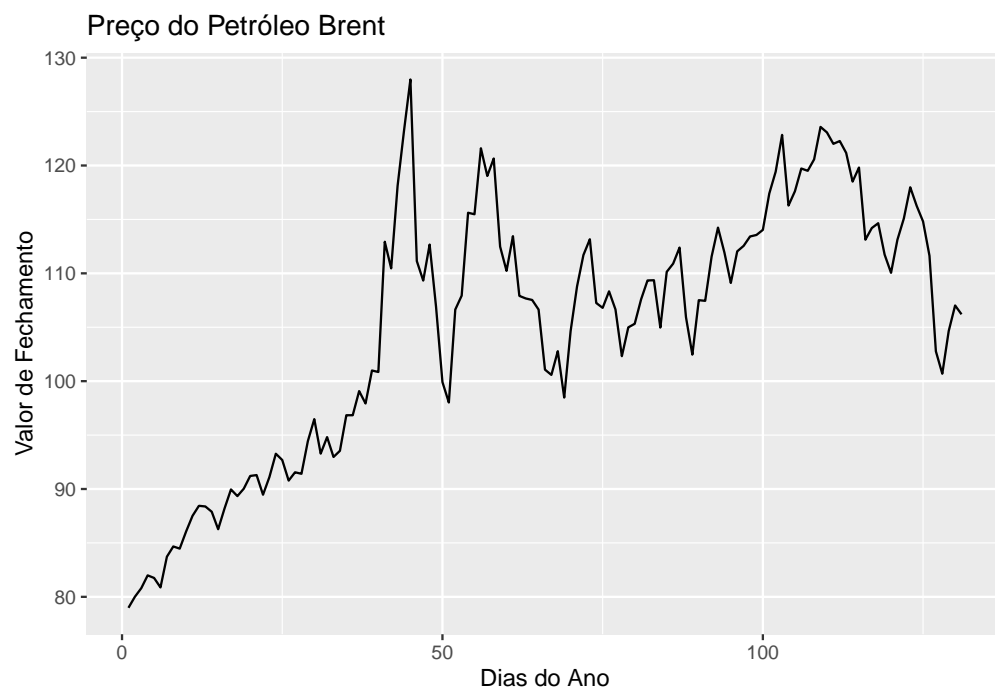
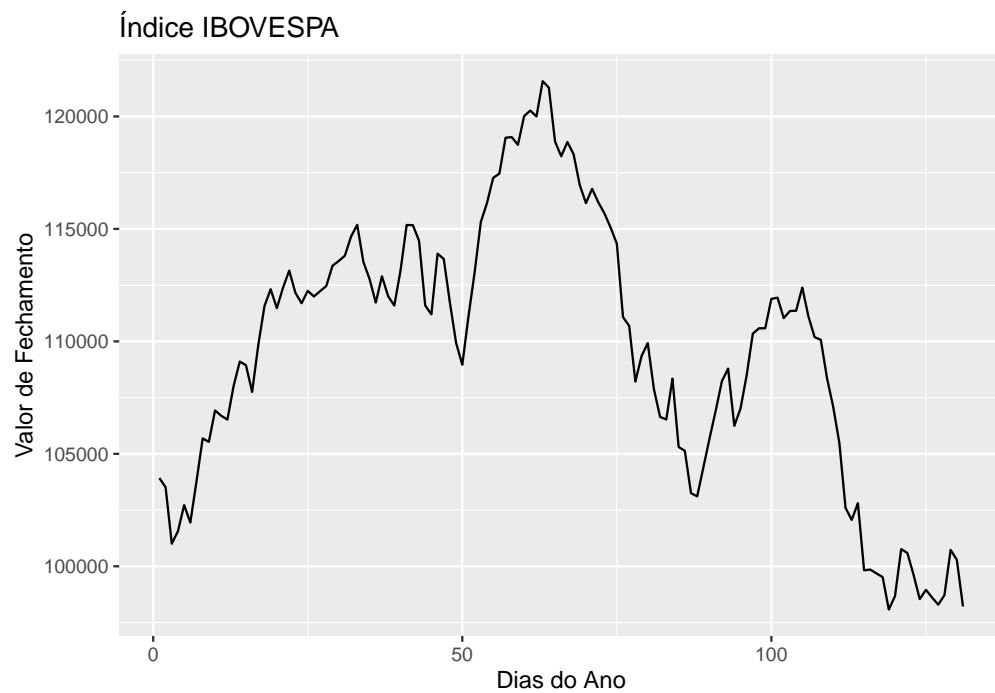


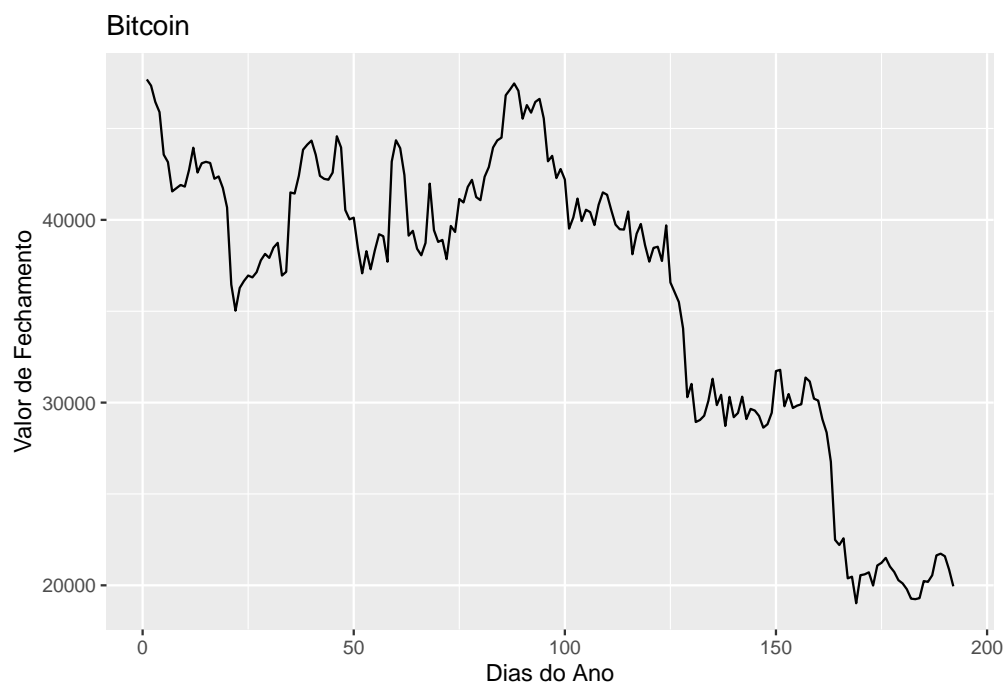
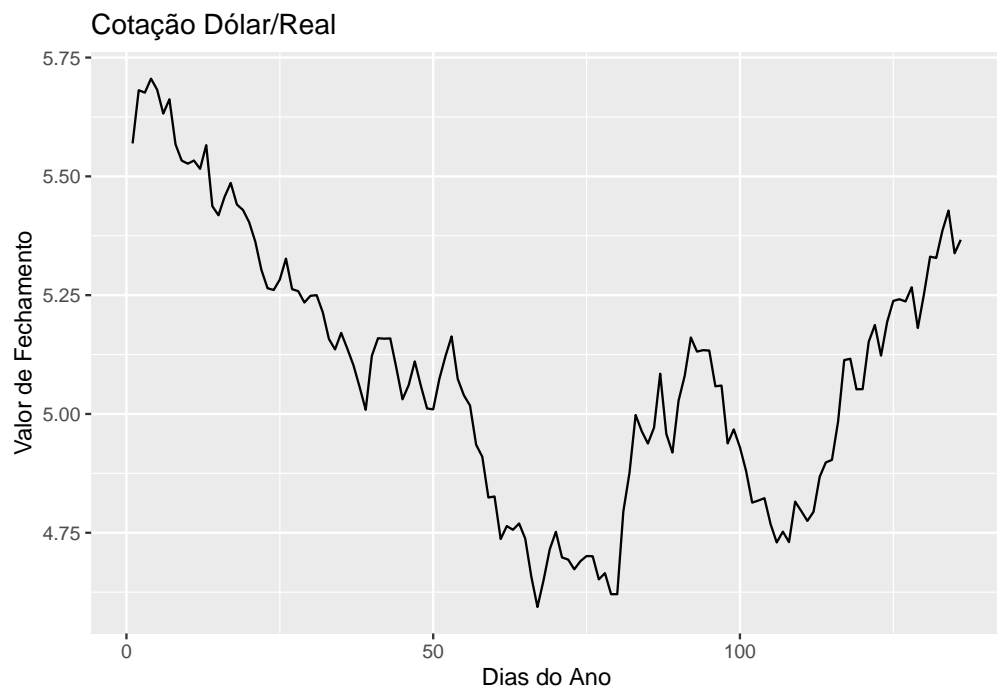
Índice Dow Jones



Índice Nasdaq







Em seguida, podemos fazer o teste ADF para as séries temporais originais obtidas.

```
##
## Augmented Dickey-Fuller Test
##
## data: stdpoors.ts
## Dickey-Fuller = -2.6571, Lag order = 5, p-value = 0.3033
## alternative hypothesis: stationary
##
## Augmented Dickey-Fuller Test
```

```

##
## data:  dowjones.ts
## Dickey-Fuller = -2.9621, Lag order = 5, p-value = 0.1765
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data:  nasdaq.ts
## Dickey-Fuller = -2.5921, Lag order = 5, p-value = 0.3304
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data:  bovespa.ts
## Dickey-Fuller = -2.5755, Lag order = 5, p-value = 0.3372
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data:  brent.ts
## Dickey-Fuller = -2.4028, Lag order = 5, p-value = 0.409
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data:  dolar.ts
## Dickey-Fuller = -1.1202, Lag order = 5, p-value = 0.9161
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data:  bitcoin.ts
## Dickey-Fuller = -1.758, Lag order = 5, p-value = 0.6774
## alternative hypothesis: stationary

```

Com os plots das séries temporais, podemos, então, obter as séries do log, e da diferença do log e, assim realizar o teste ADF novamente.

```

## Warning in adf.test(stdpoors.ts.difflog): p-value smaller than printed p-value

##
## Augmented Dickey-Fuller Test
##
## data:  stdpoors.ts.difflog
## Dickey-Fuller = -5.0284, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

## Warning in adf.test(dowjones.ts.difflog): p-value smaller than printed p-value

##
## Augmented Dickey-Fuller Test
##
## data:  dowjones.ts.difflog
## Dickey-Fuller = -5.0185, Lag order = 5, p-value = 0.01

```

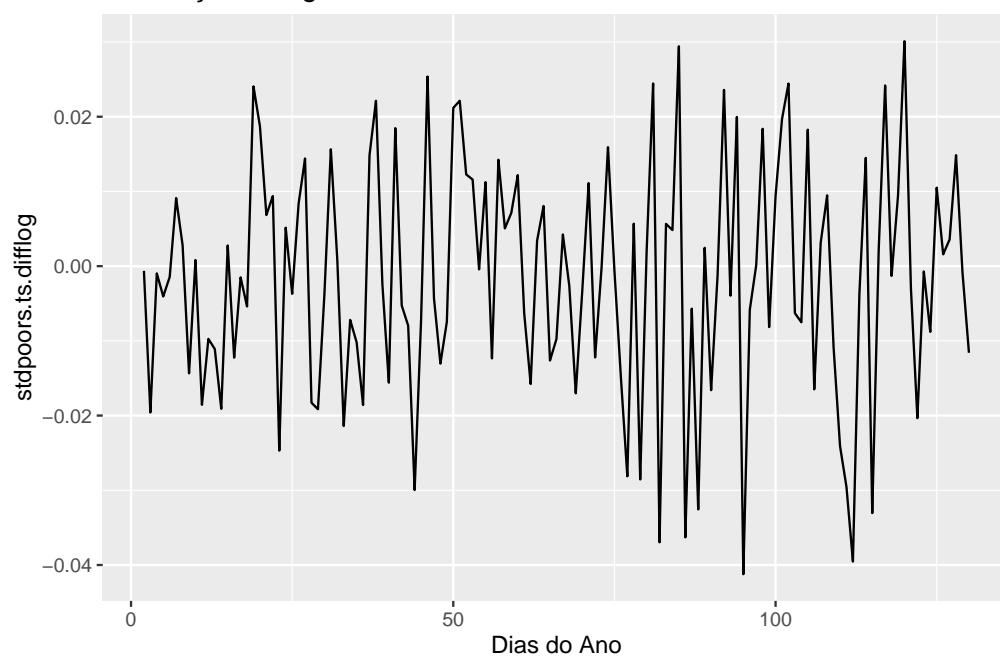
```

## alternative hypothesis: stationary
## Warning in adf.test(nasdaq.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data:  nasdaq.ts.difflog
## Dickey-Fuller = -5.2601, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary
##
## Augmented Dickey-Fuller Test
##
## data:  bovespa.ts.difflog
## Dickey-Fuller = -3.9145, Lag order = 5, p-value = 0.01564
## alternative hypothesis: stationary
## Warning in adf.test(brent.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data:  brent.ts.difflog
## Dickey-Fuller = -6.2331, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary
## Warning in adf.test(dolar.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data:  dolar.ts.difflog
## Dickey-Fuller = -4.2795, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary
## Warning in adf.test(bitcoin.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data:  bitcoin.ts.difflog
## Dickey-Fuller = -5.6309, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

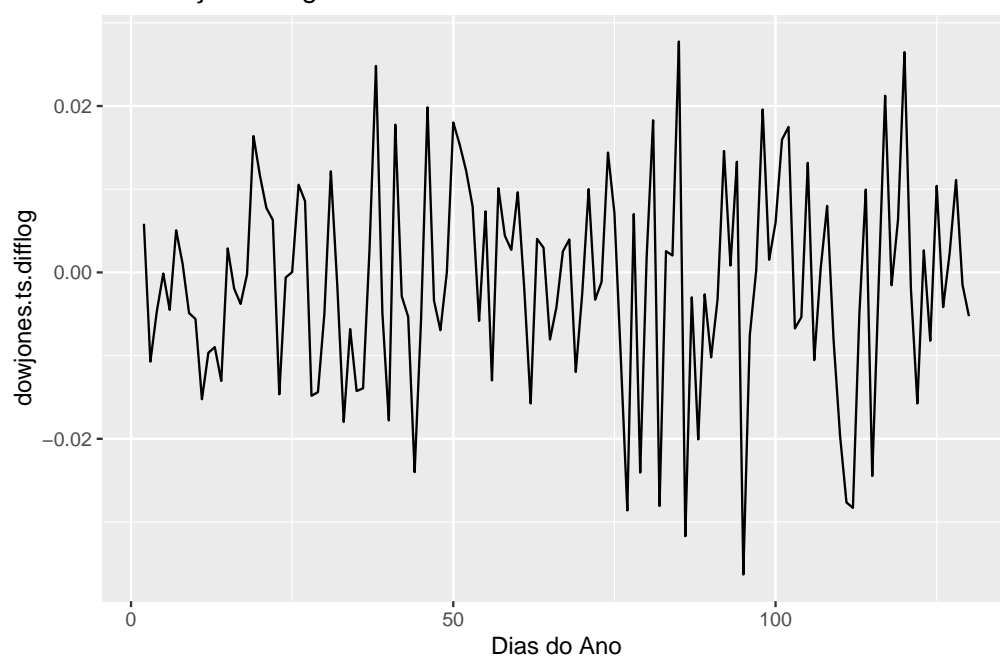
```

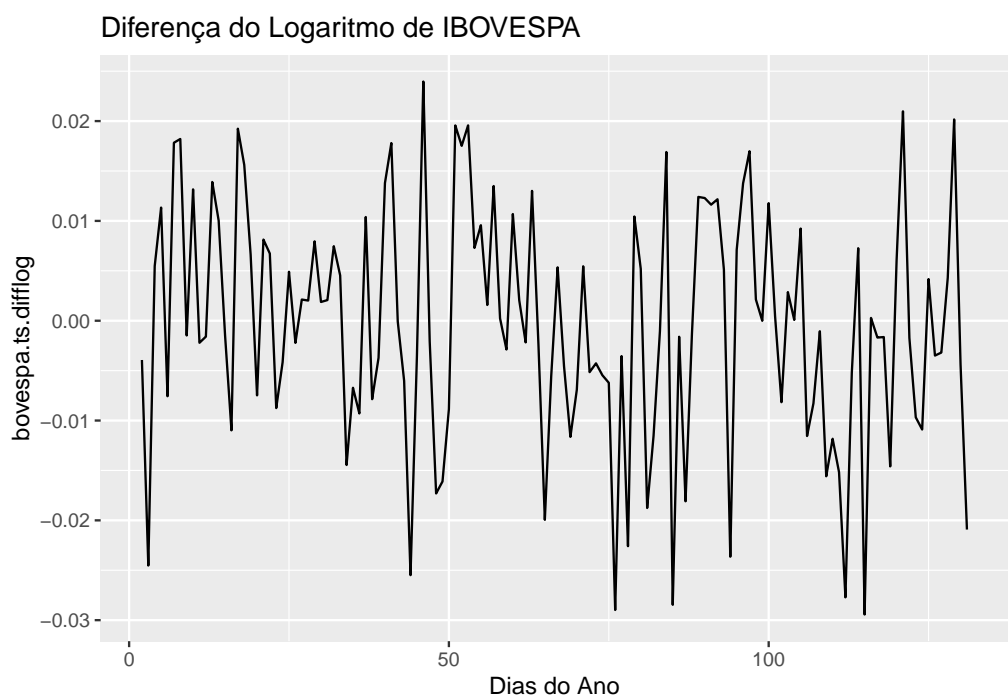
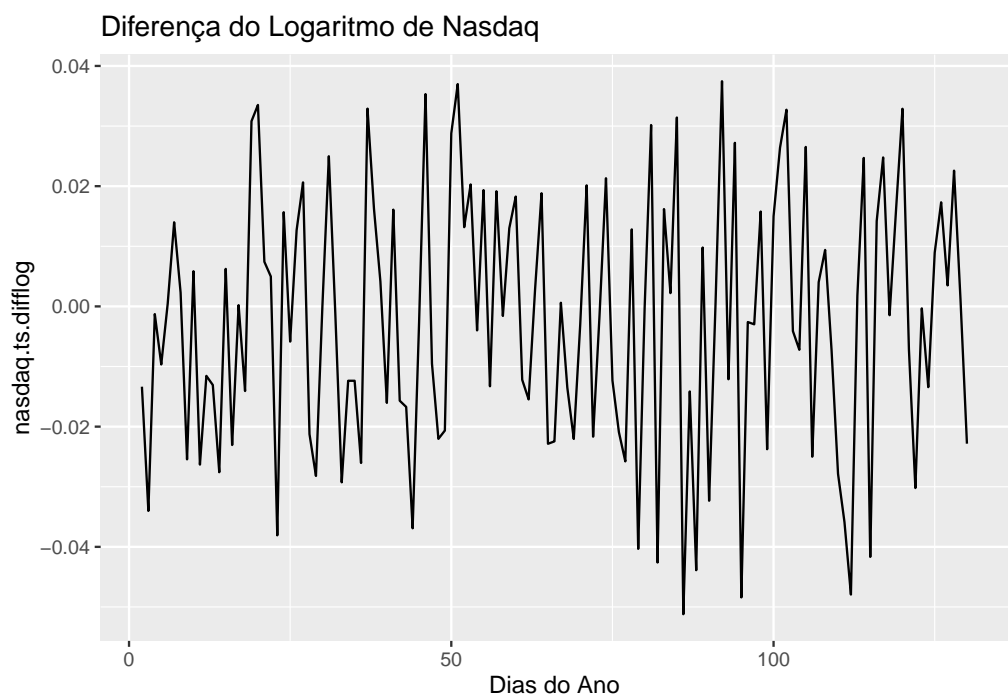
Assim, com os resultados do teste ADF, podemos então realizar o plot das séries da diferença do logaritmo.

Diferença do Logaritmo de S&P500



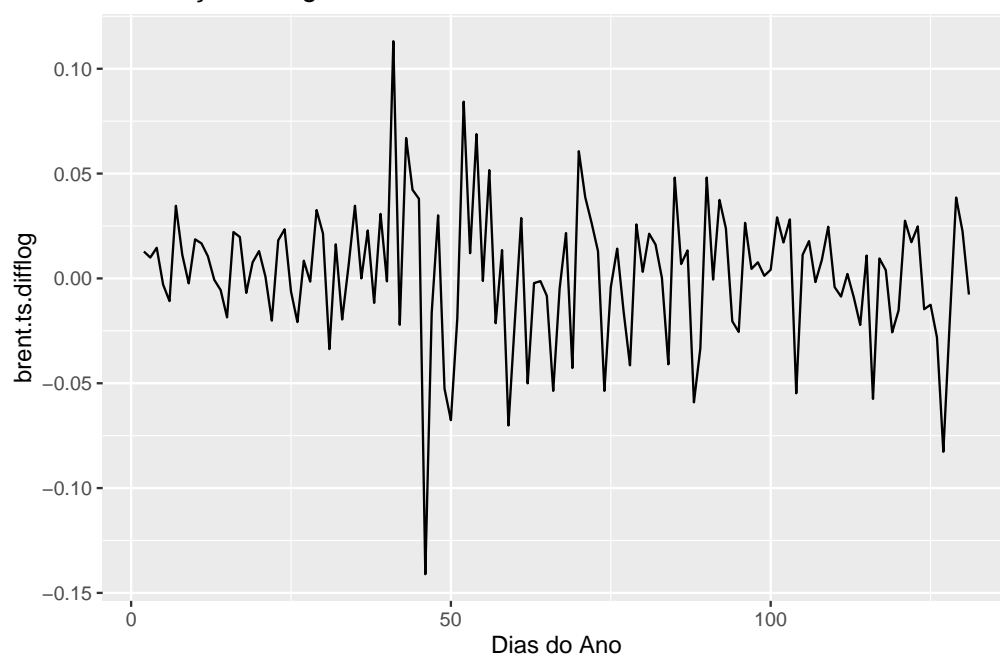
Diferença do Logaritmo de Dow Jones



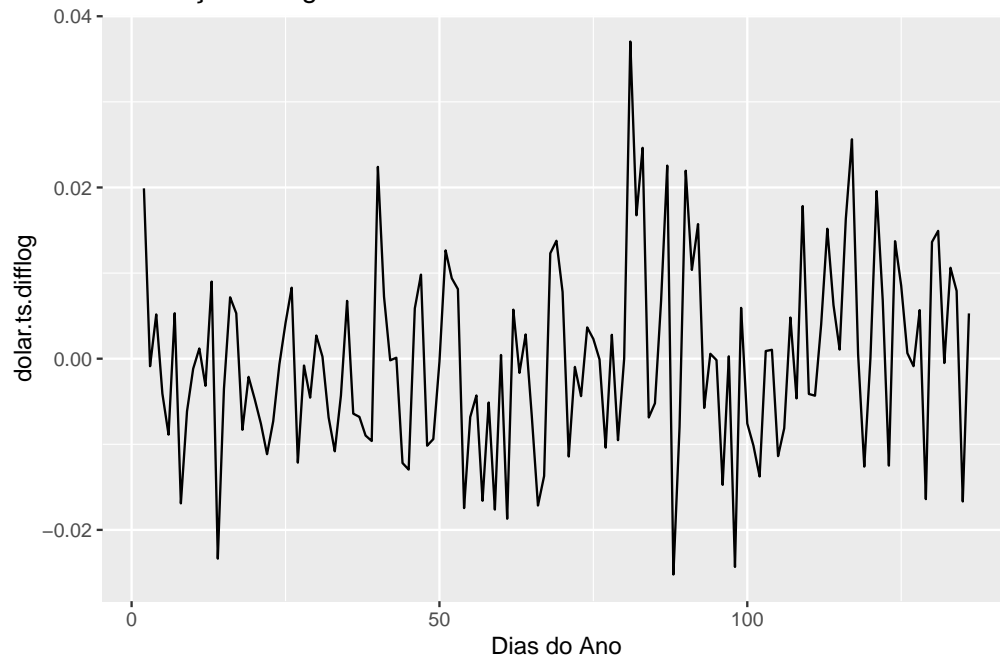


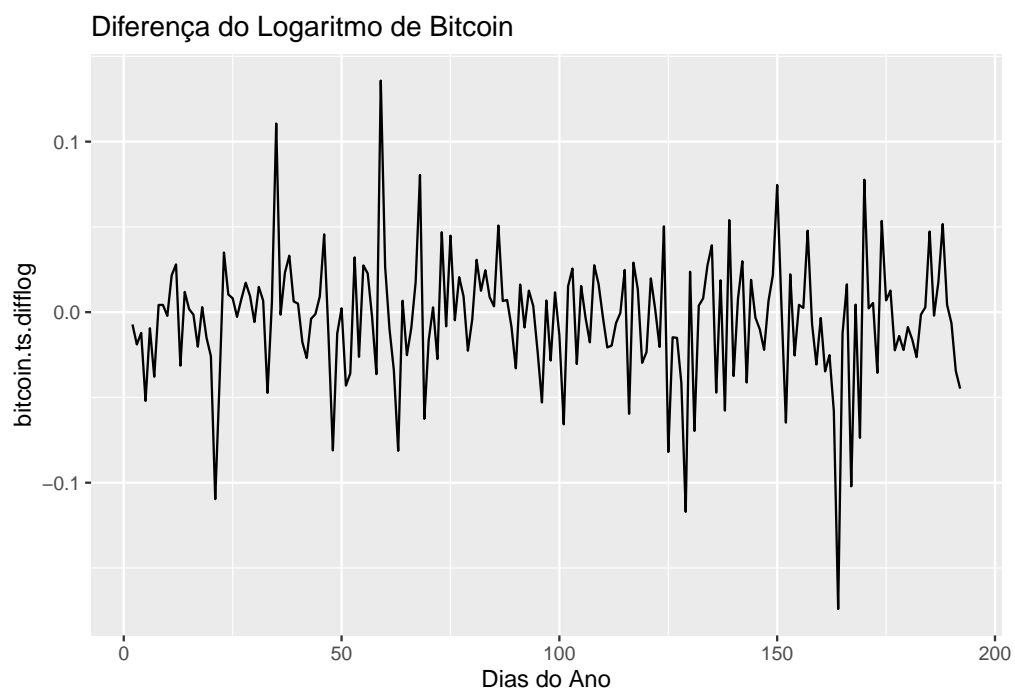


Diferença do Logaritmo de Petróleo Brent



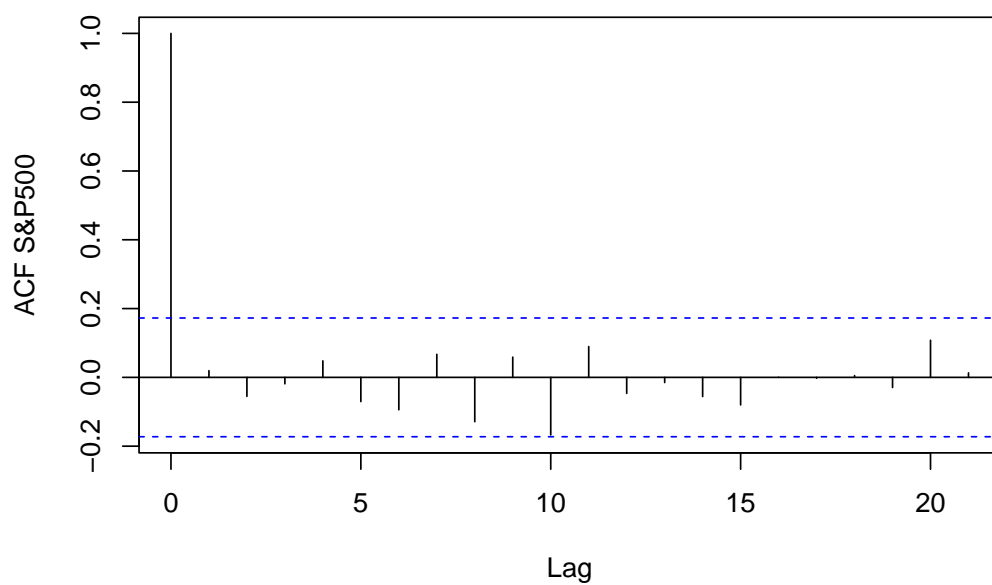
Diferença do Logaritmo de Dólar



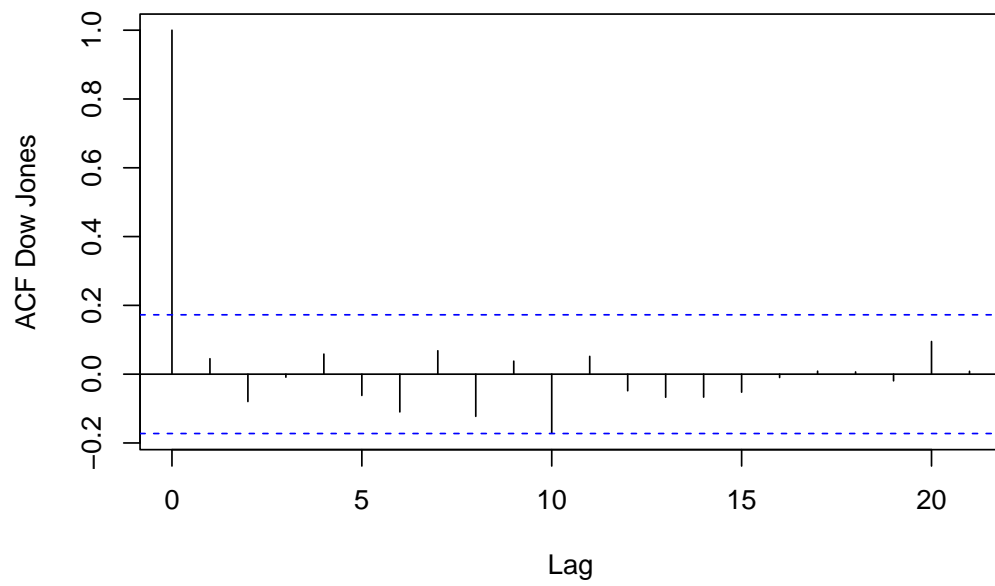


Feitos os plots das diferenças dos logaritmos, podemos, então, construir o correlograma da série da diferença do logaritmo de cada uma das séries criadas.

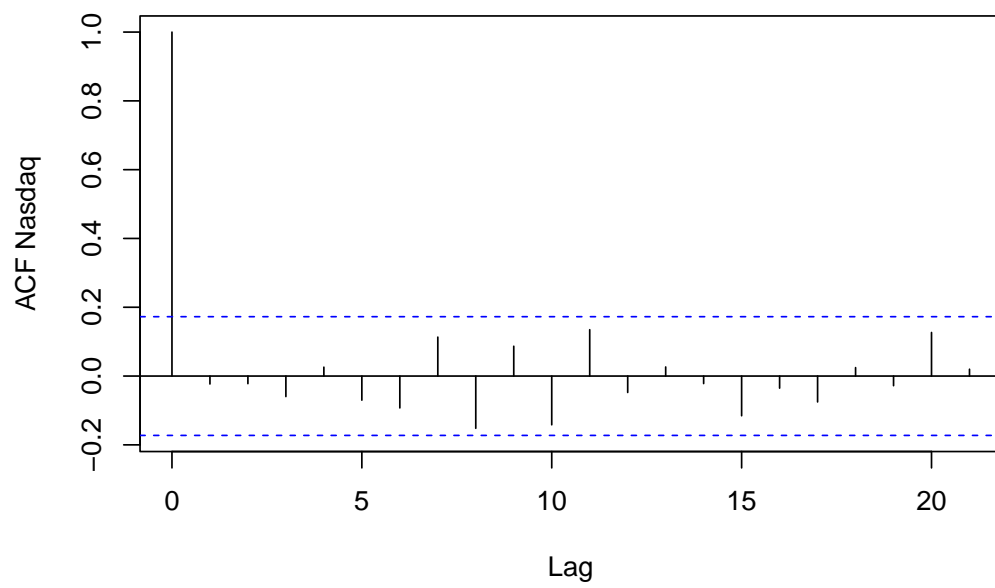
### GSPC.Close



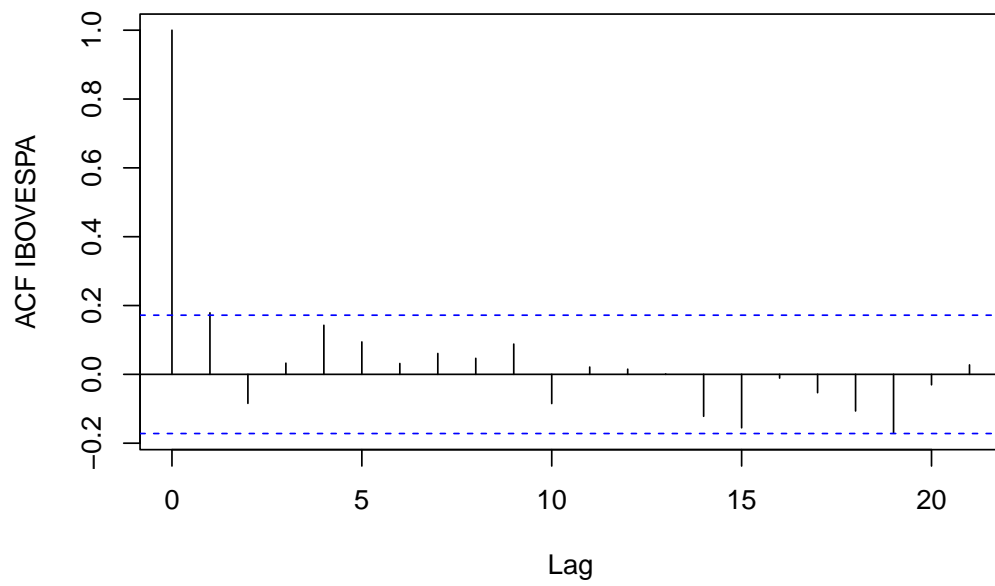
**DJI.Close**



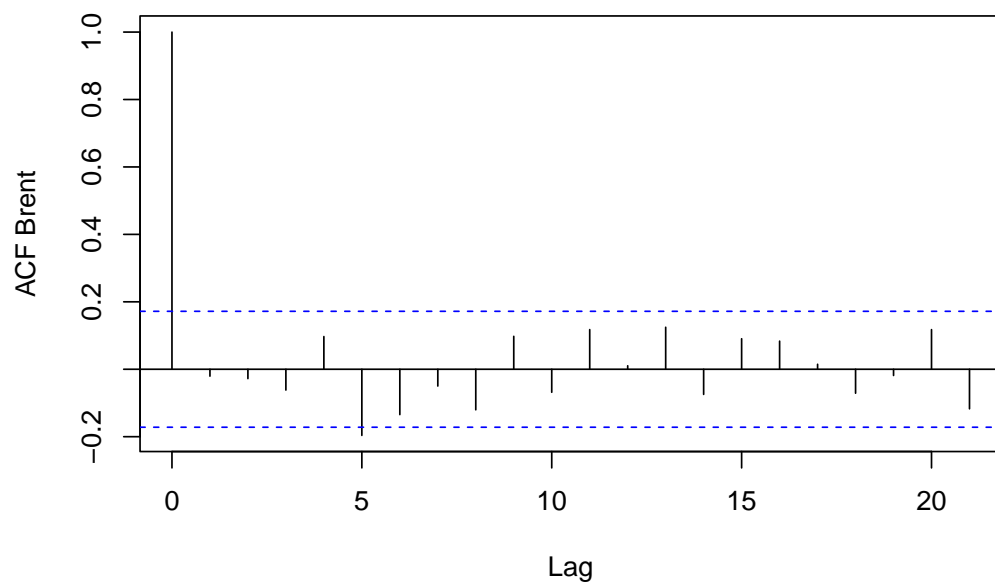
**IXIC.Close**



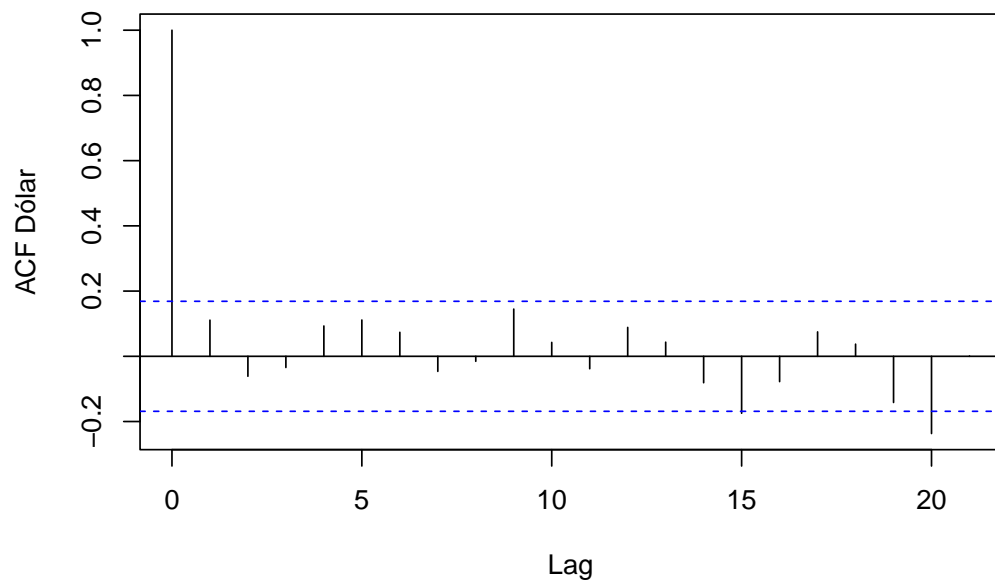
**BVSP.Close**



**BZ=F.Close**



**BRL=X.Close**



**BTC-USD.Close**

