Časovne vrste - seminarska naloga

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Maj, 2022

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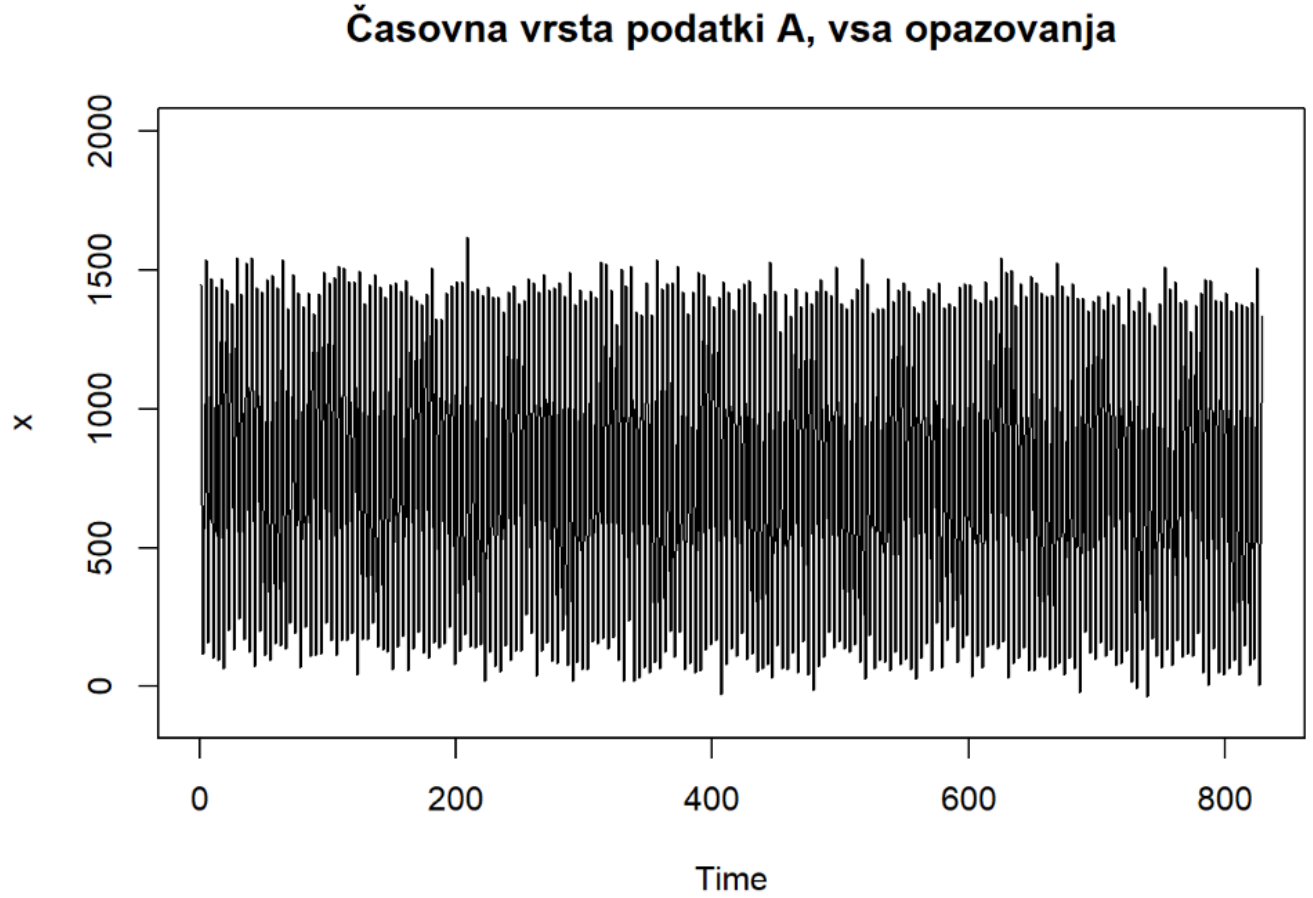
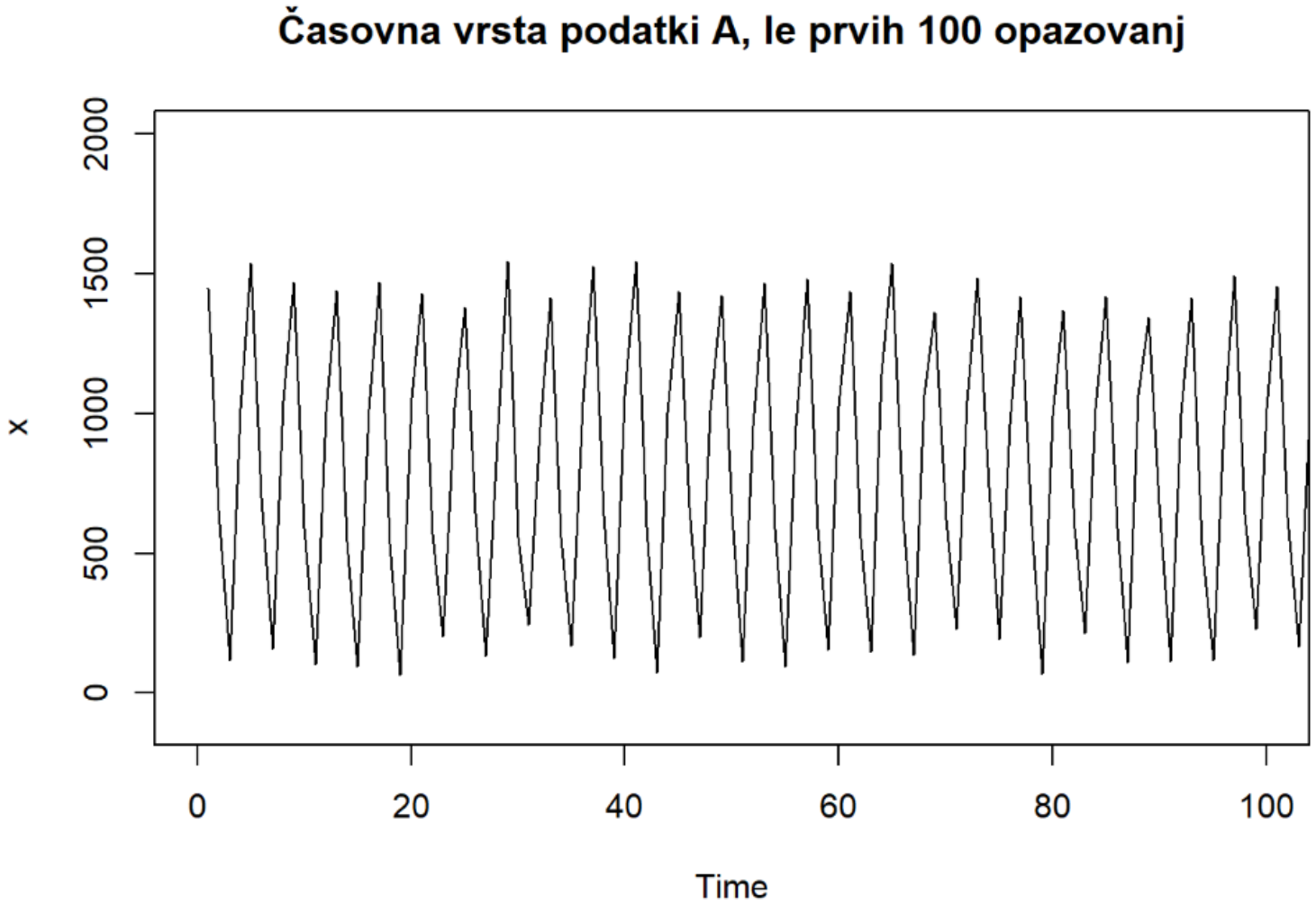
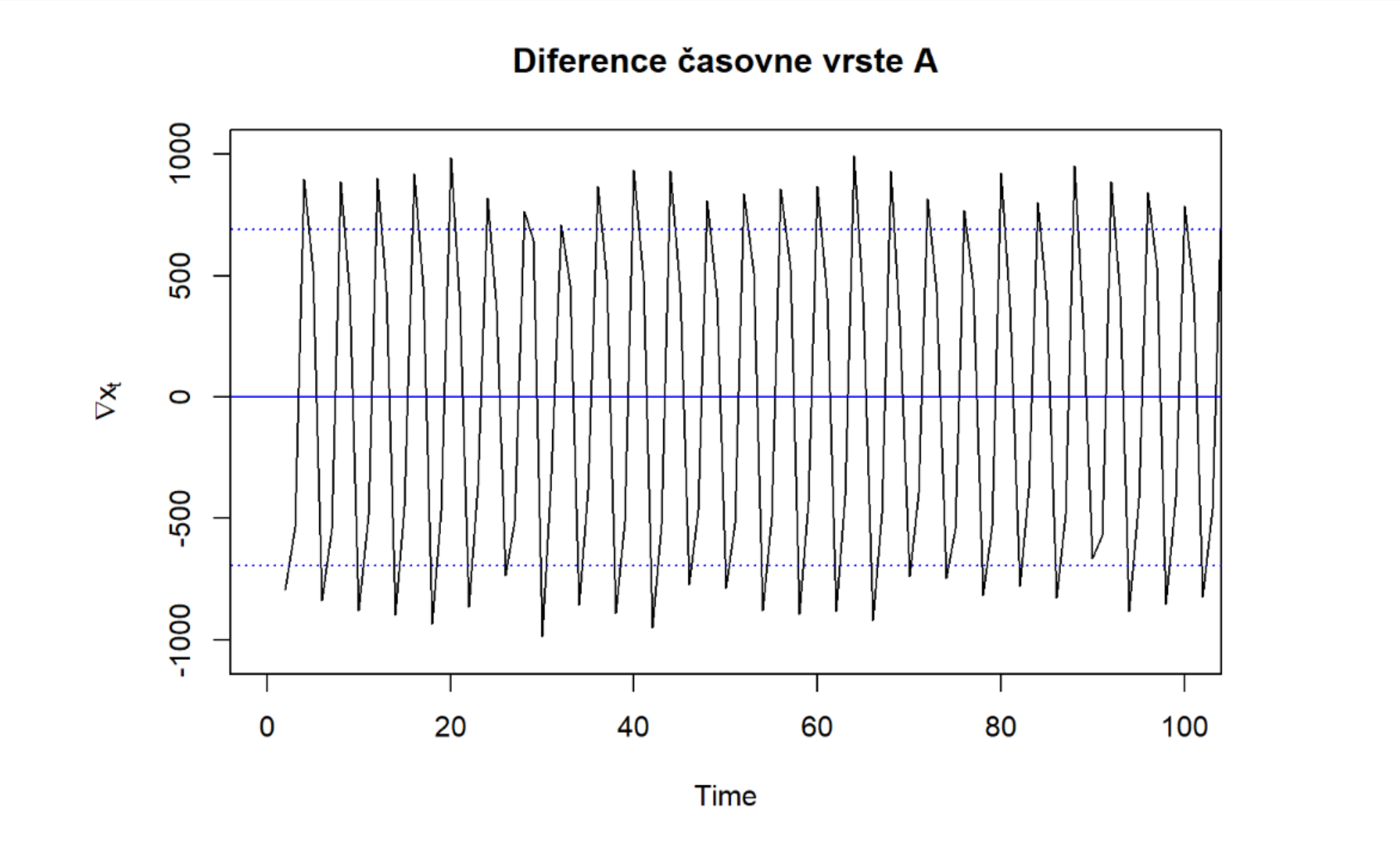
Časovna vrsta A



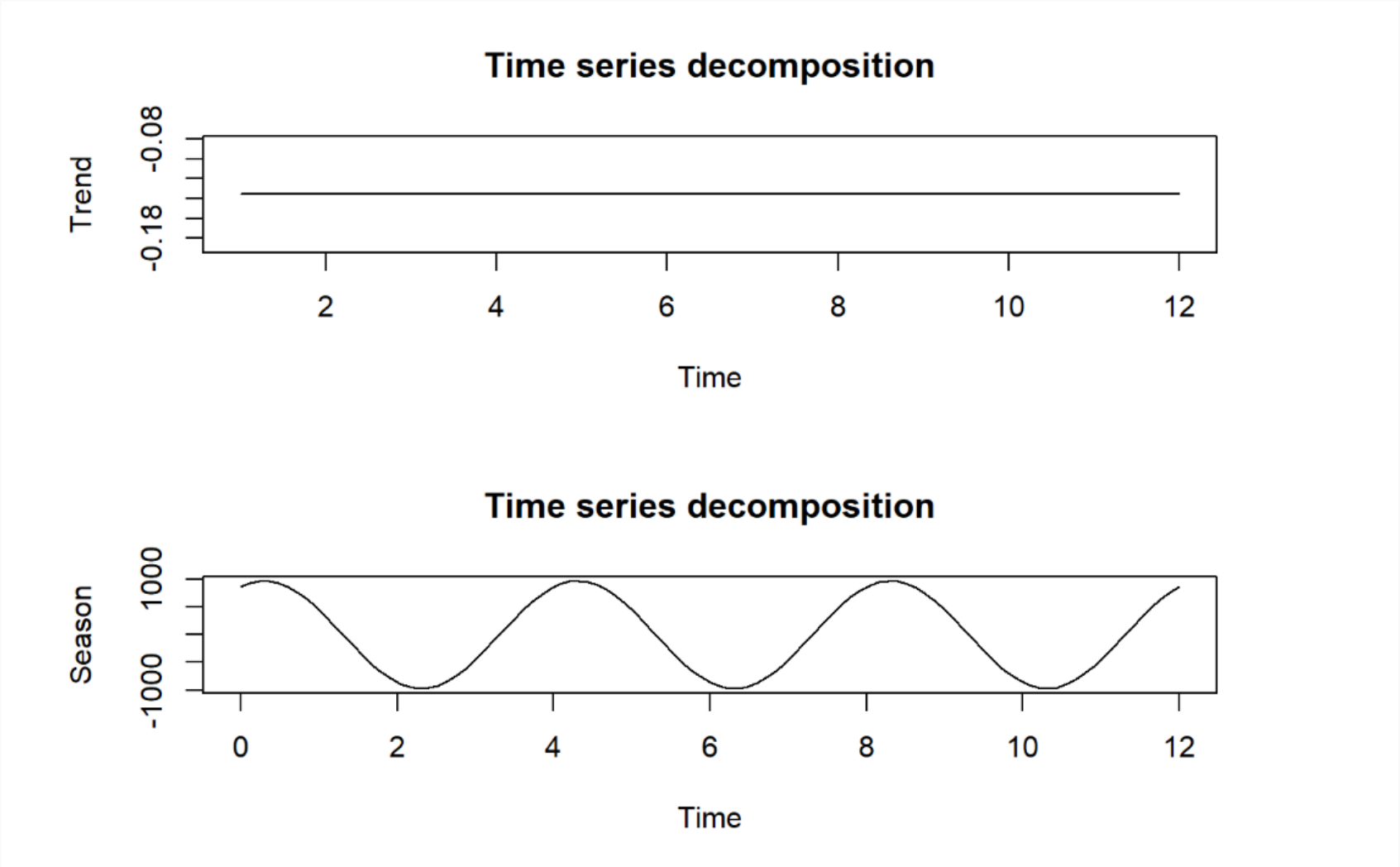
Časovna vrsta A - 100 opazovanj



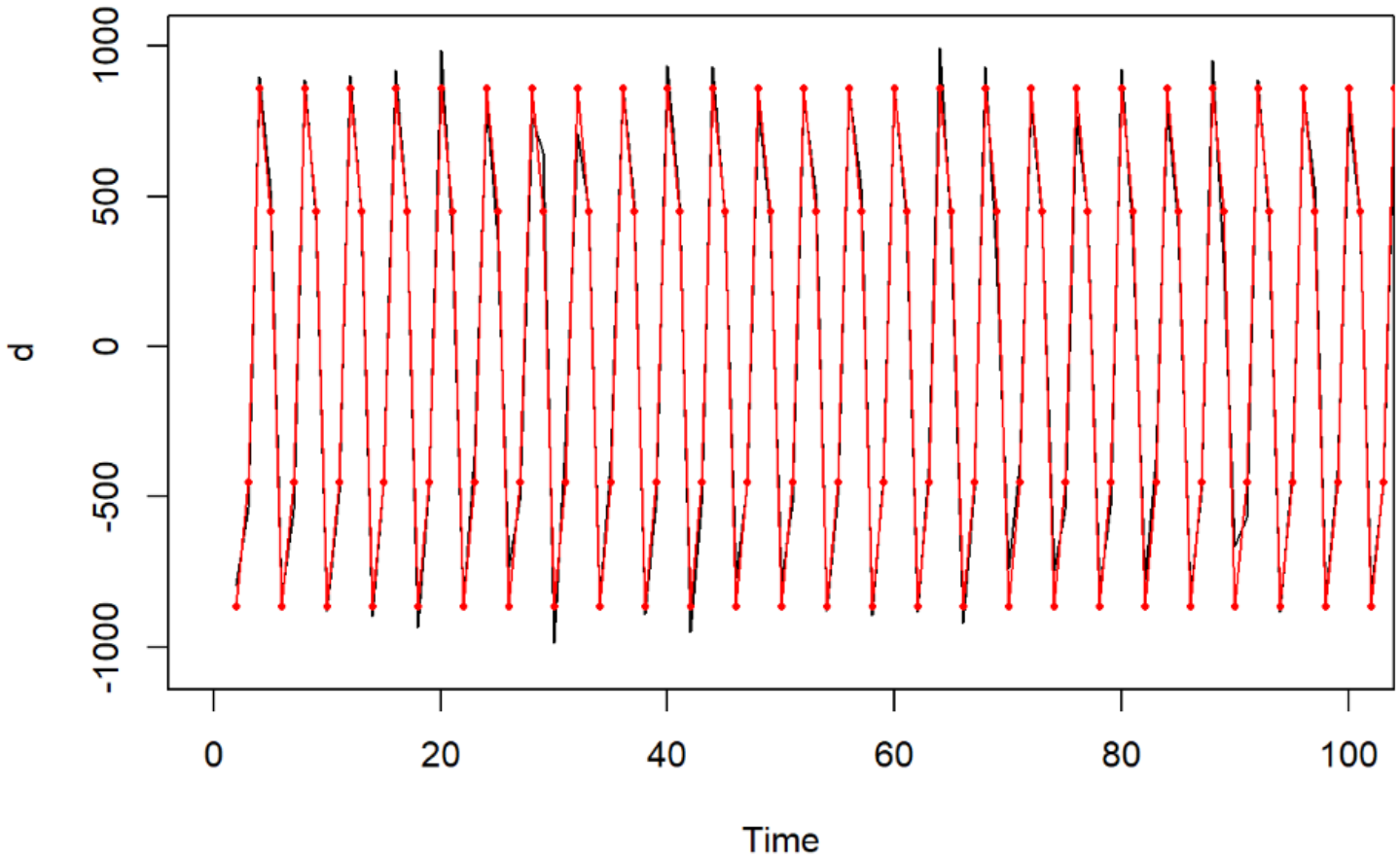
Diference


Diference časovne vrste A
∇x_t
1000
500
0
-500
-1000
0
20
40
60
80
100
Time

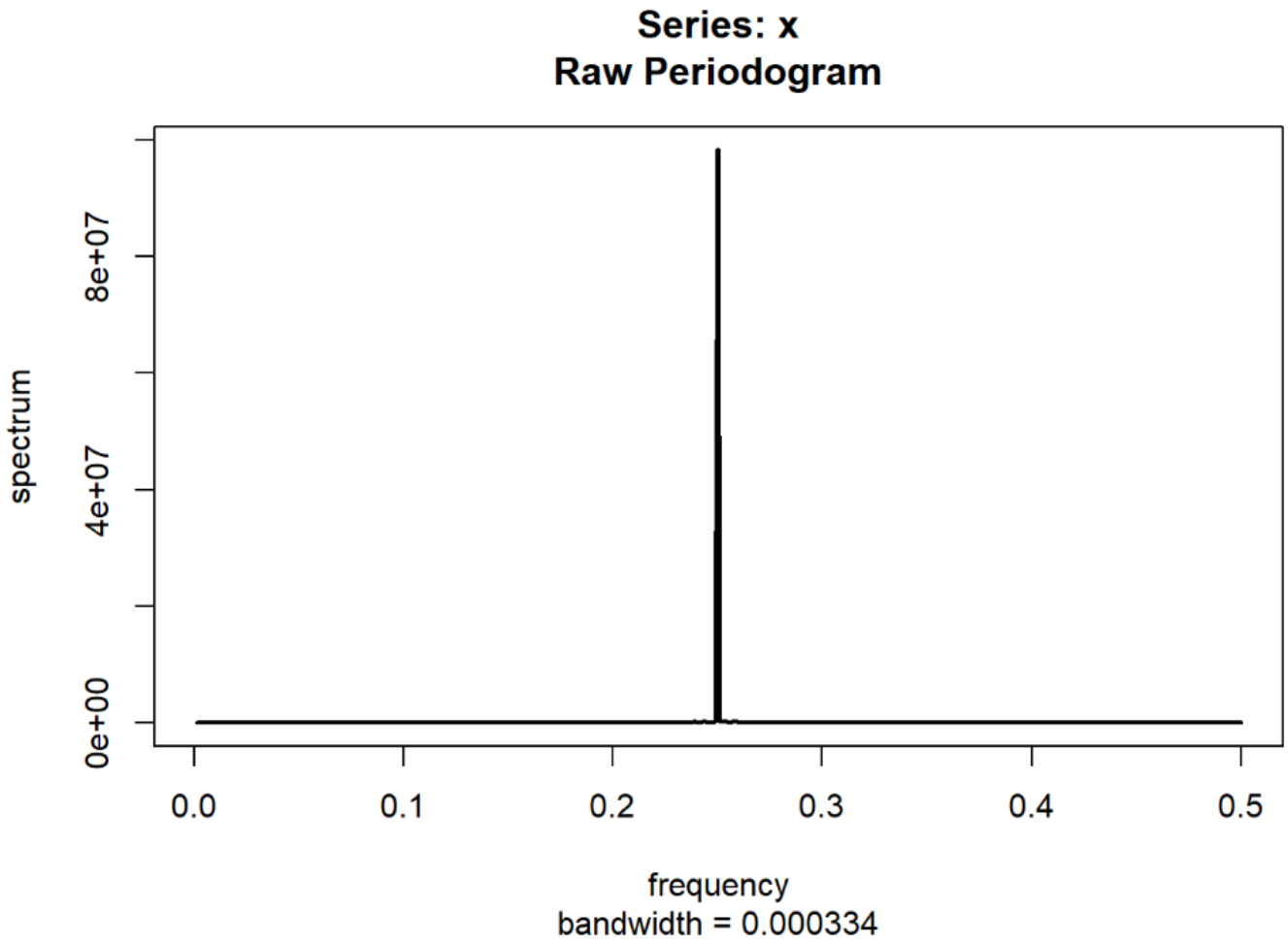
Trend in sezonskost - dekompozicija



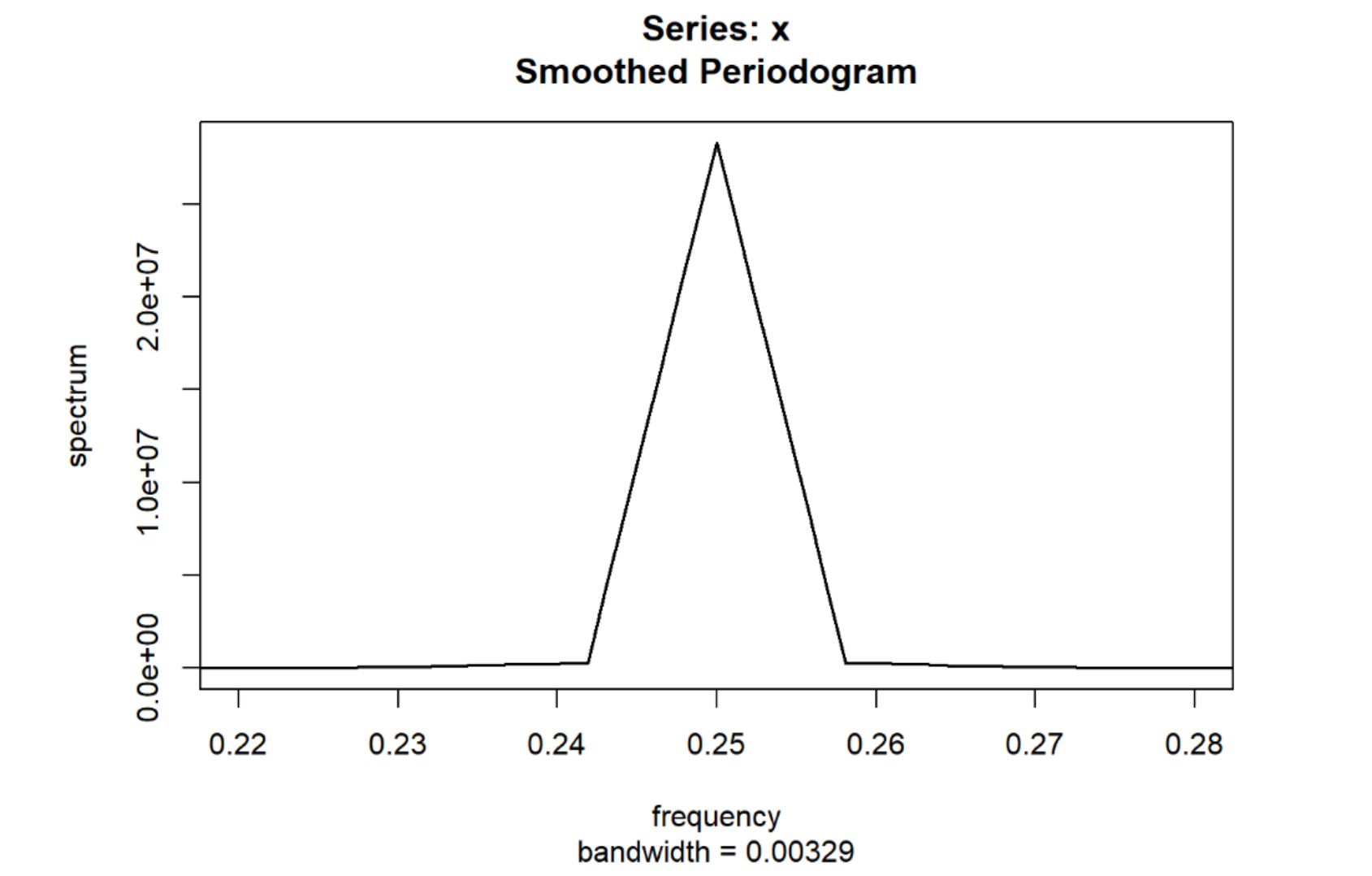
Harmonična regresija



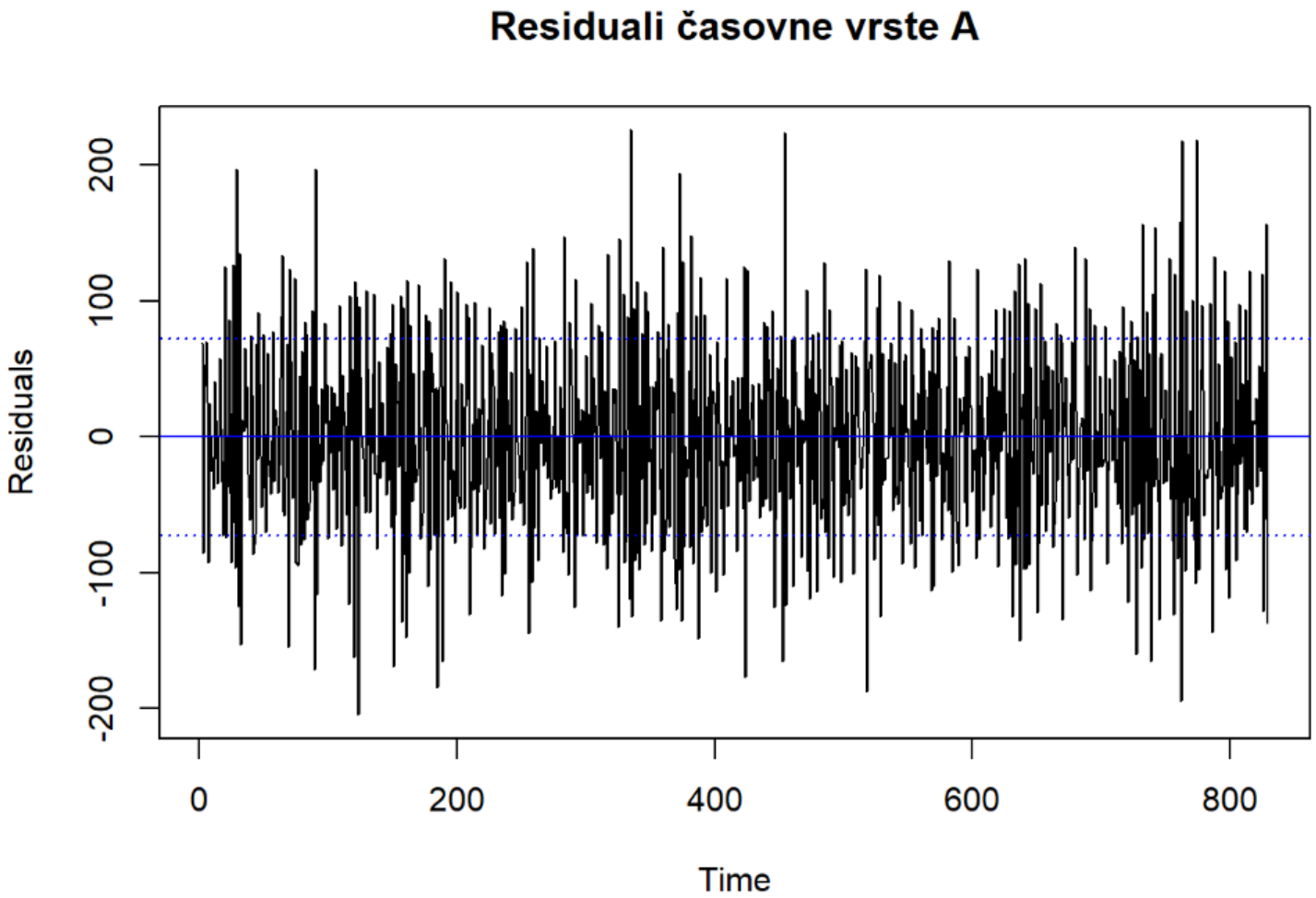
Surovi periodogram



Zglajeni periodogram

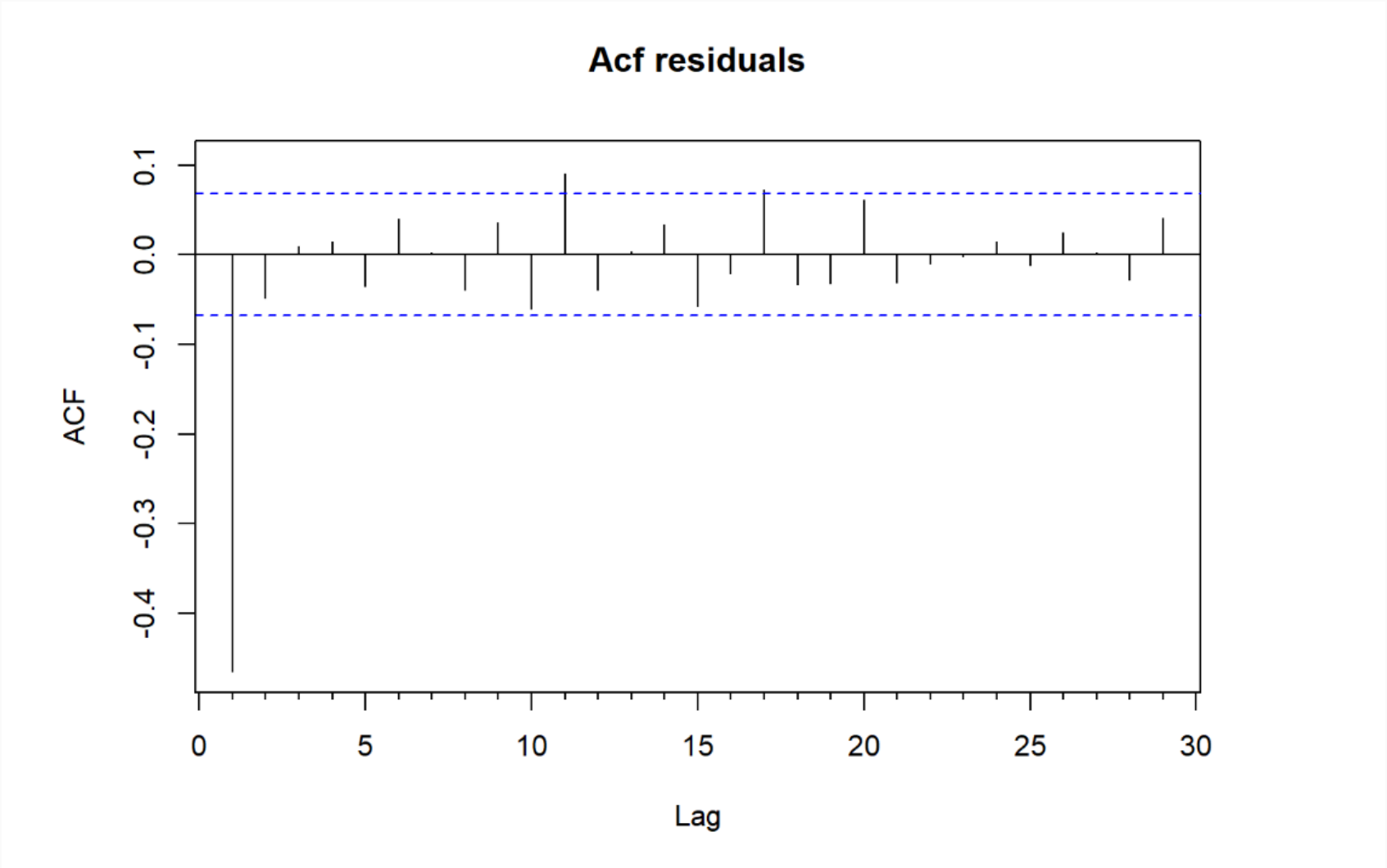


Residuali - stacionarnost

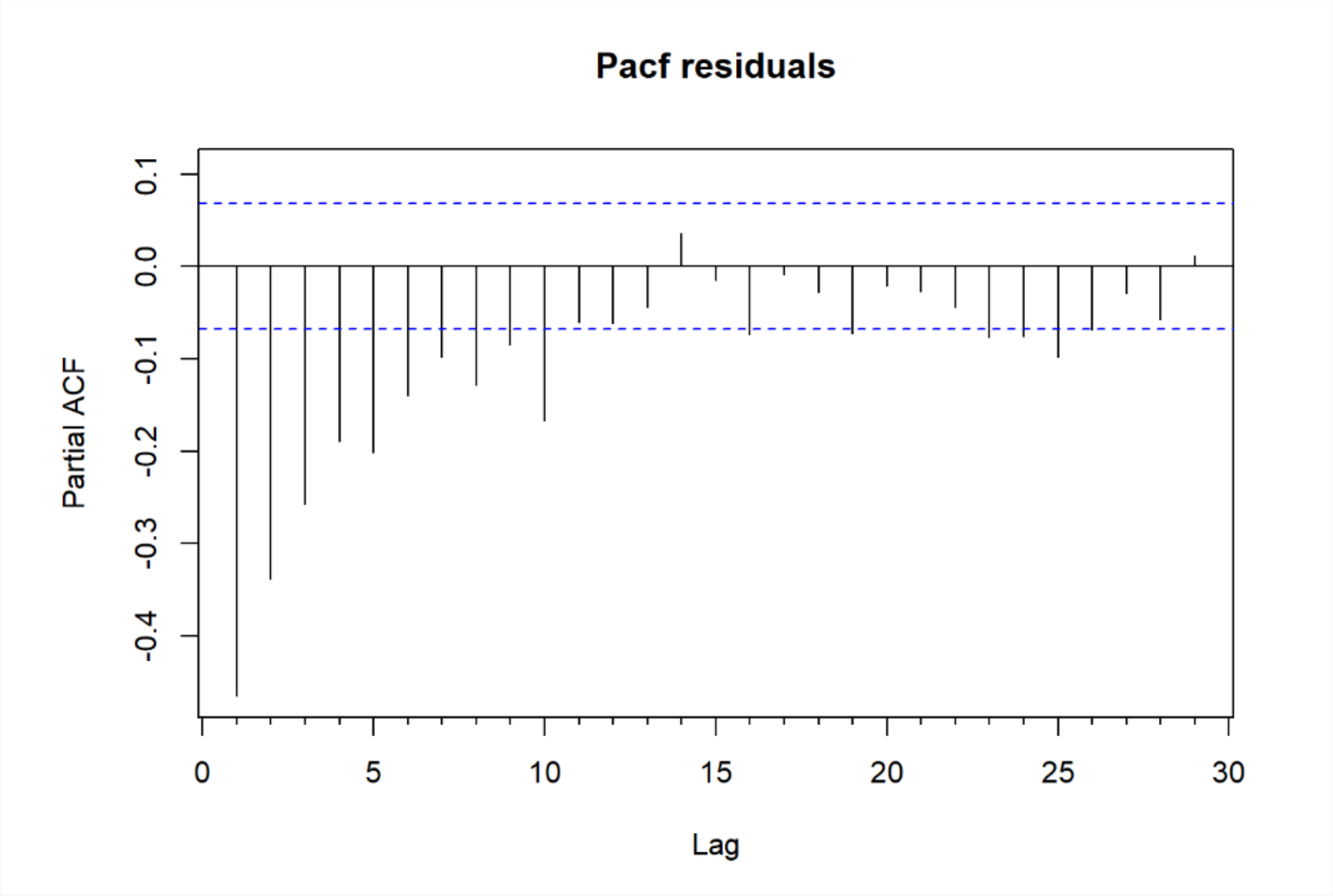



```
##
##  Augmented Dickey-Fuller Test
##
## data:  d.res
## Dickey-Fuller = -16.866, Lag order = 9, p-value = 0.01
## alternative hypothesis: stationary
```

ACF in predlog za model MA(p)



PACF in predlog za model AR(q)

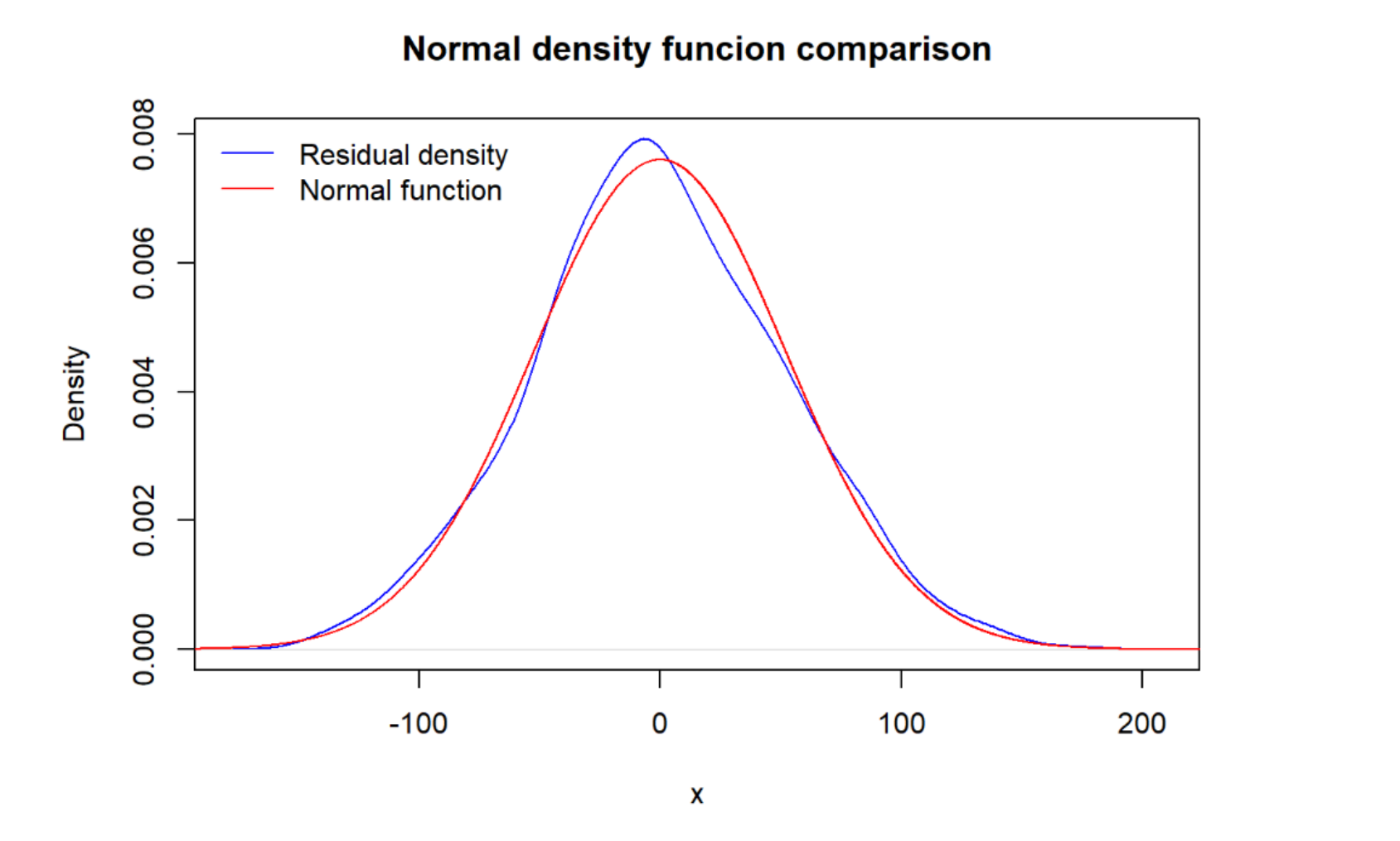


Izbira modela ARMA(p,q) za $p + q \leq 3$

```
##
## Call:
## arima(x = d.res, order = c(0, 0, 1))
##
## Coefficients:
##           ma1  intercept
##       -0.9897     0.0537
## s.e.   0.0060     0.0214
##
## sigma^2 estimated as 2748:  log likelihood = -4455.07,  aic = 8916.14
```

```
## [1] "Izbrali sva model MA(1)."
```

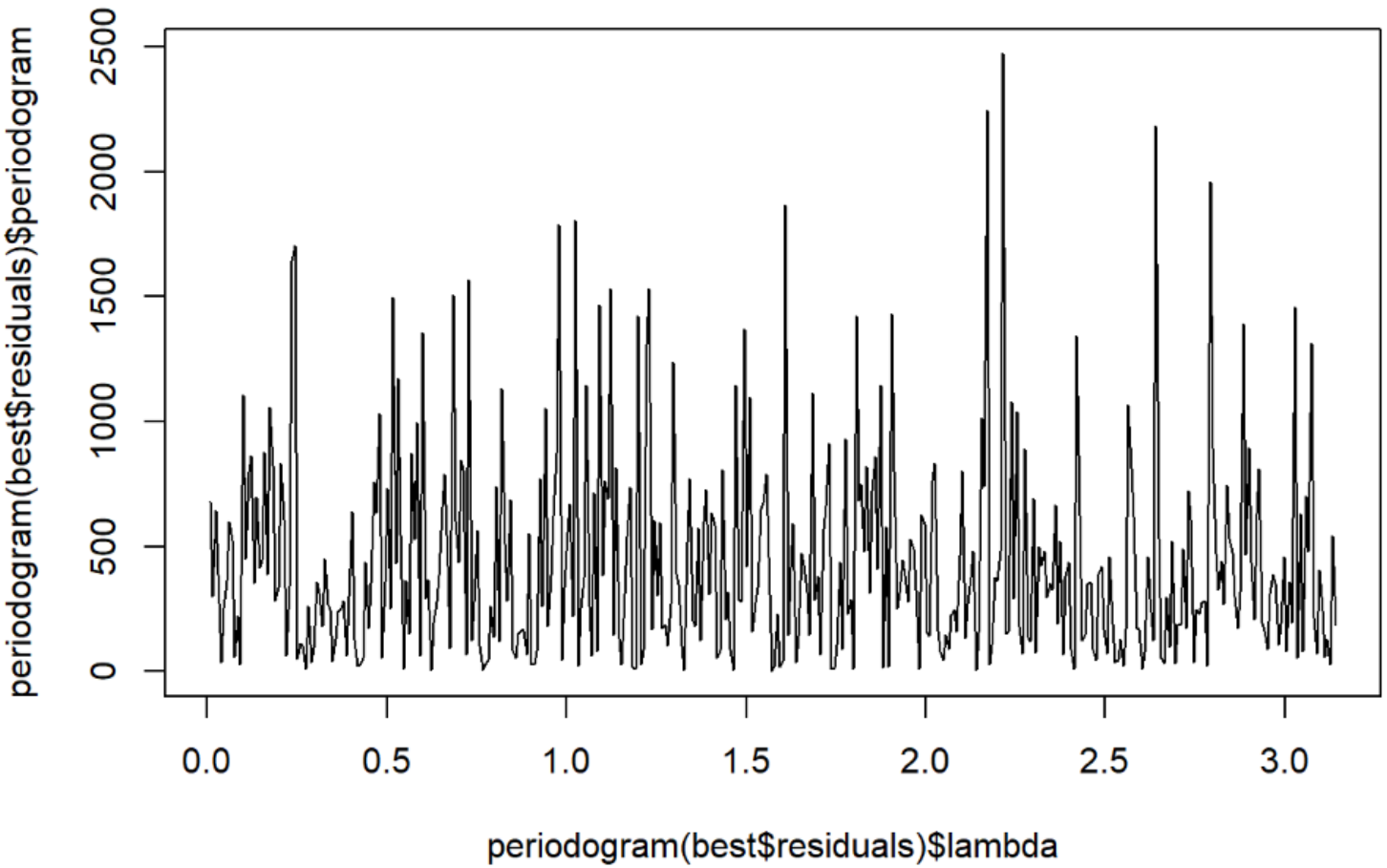
Test za normalno porazdelitev



Test za normalno porazdelitev

```
##
##  Shapiro-Wilk normality test
##
## data:  best$residuals
## W = 0.99795, p-value = 0.4167
```

White Noise


periodogram(best$residuals)$periodogram
0
500
1000
1500
2000
2500
0.0
0.5
1.0
1.5
2.0
2.5
3.0
periodogram(best$residuals)$lambda

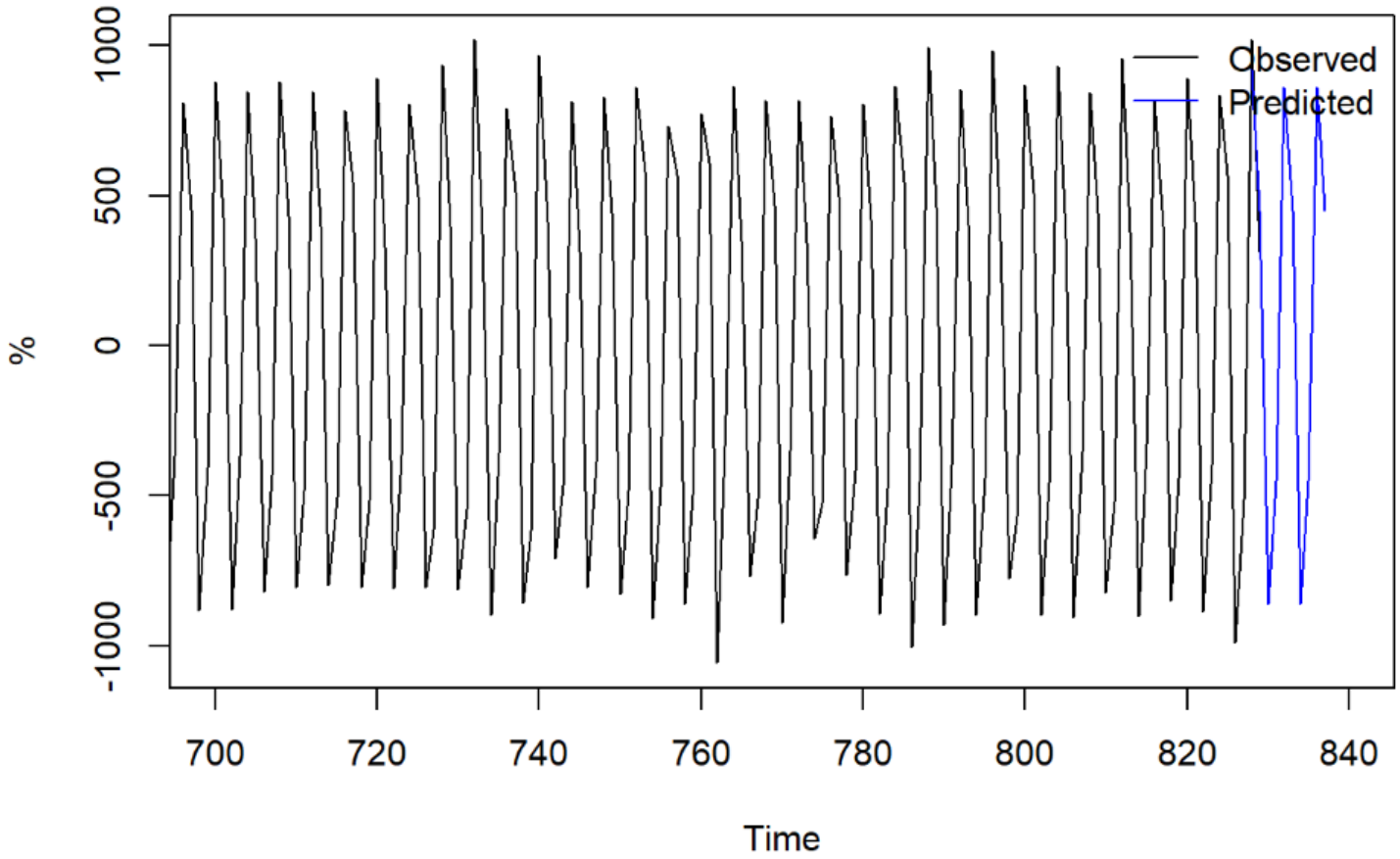
White Noise

```
##
##  Box-Pierce test
##
## data:  d.res
## X-squared = 179.27, df = 1, p-value < 2.2e-16
```

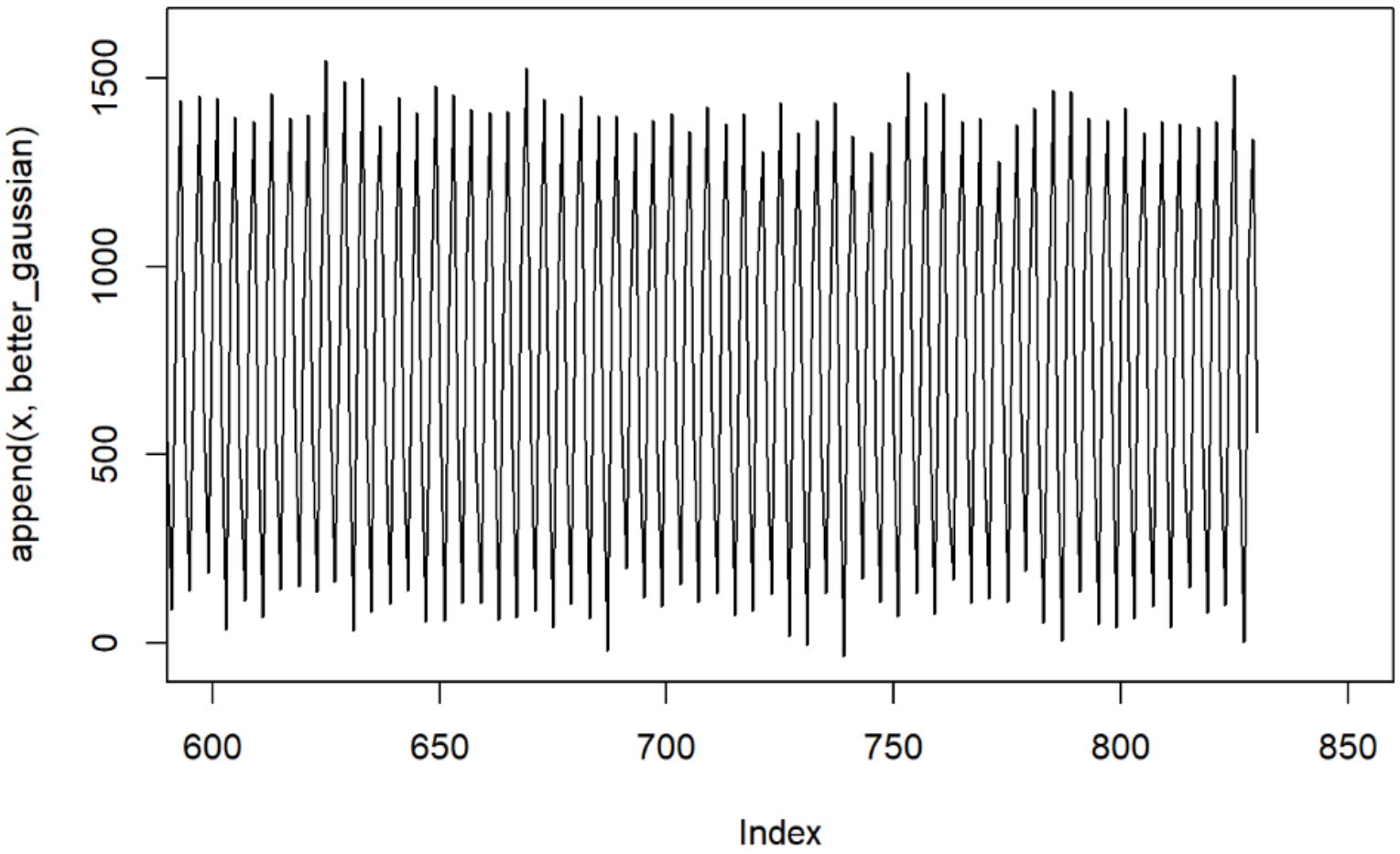
```
##
##  Box-Ljung test
##
## data:  d.res
## X-squared = 179.92, df = 1, p-value < 2.2e-16
```

```
## [1] "Ne gre za white noise."
```

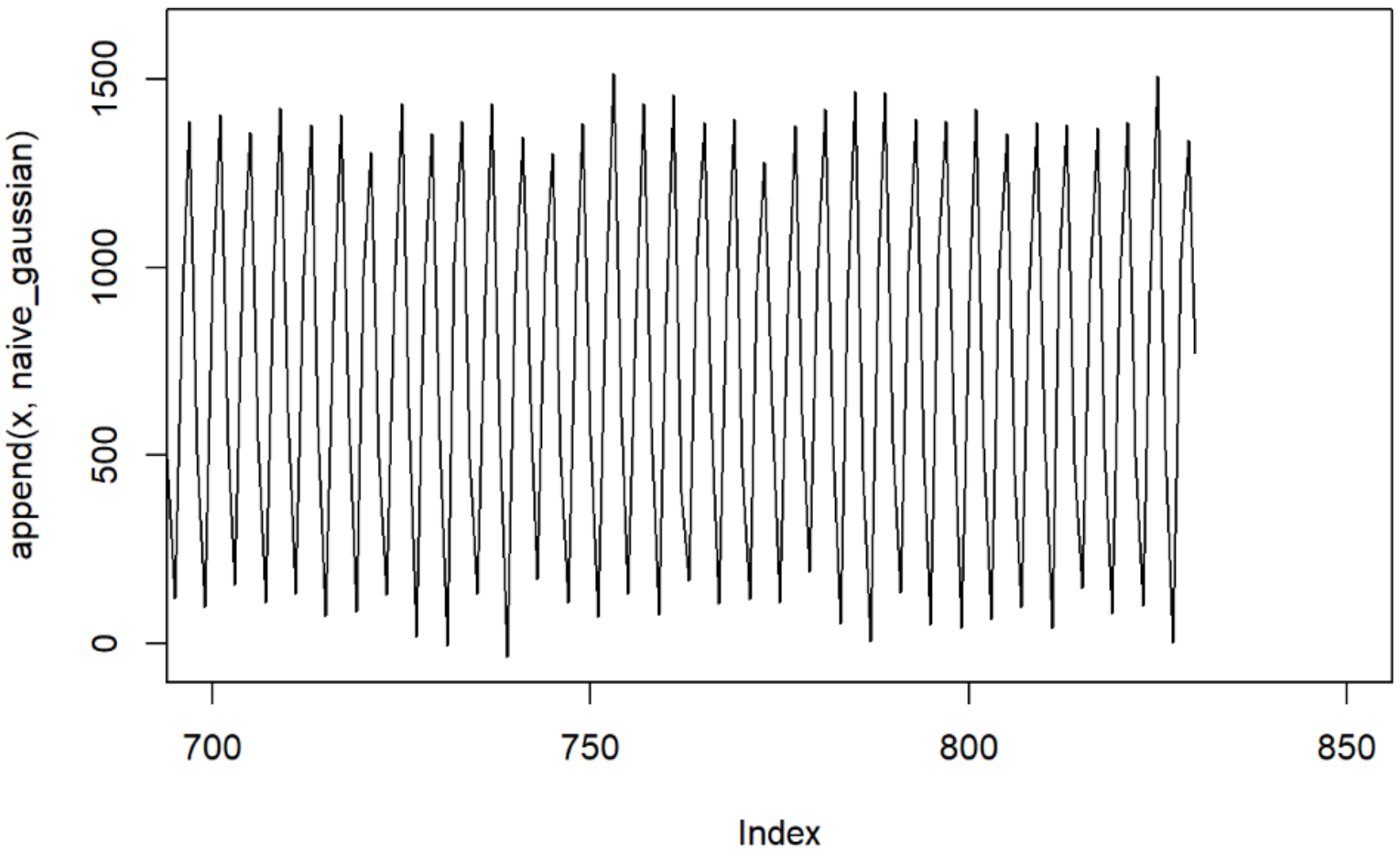
Napoved časovne vrste A



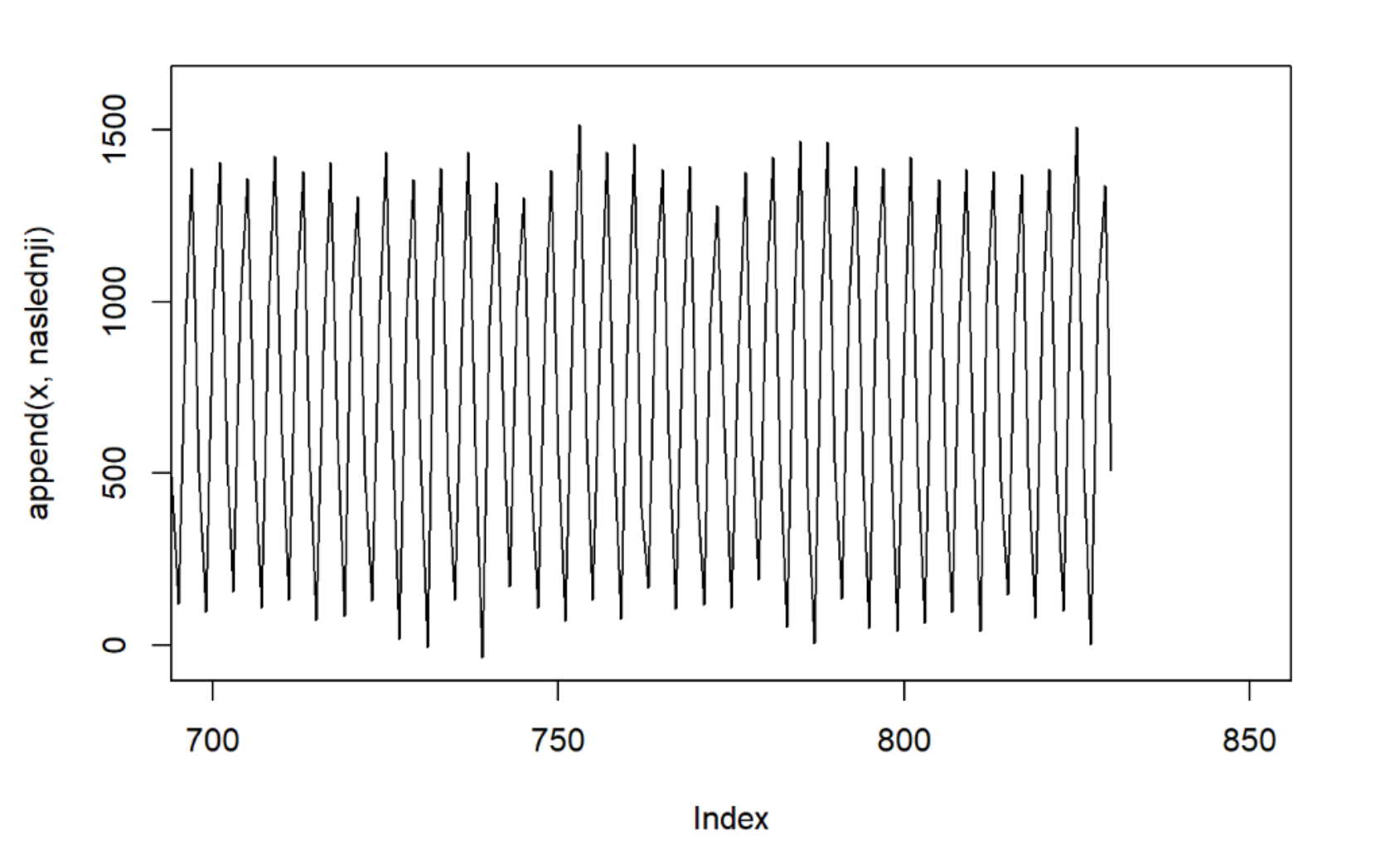
Gaussova napoved



Gaussova napoved

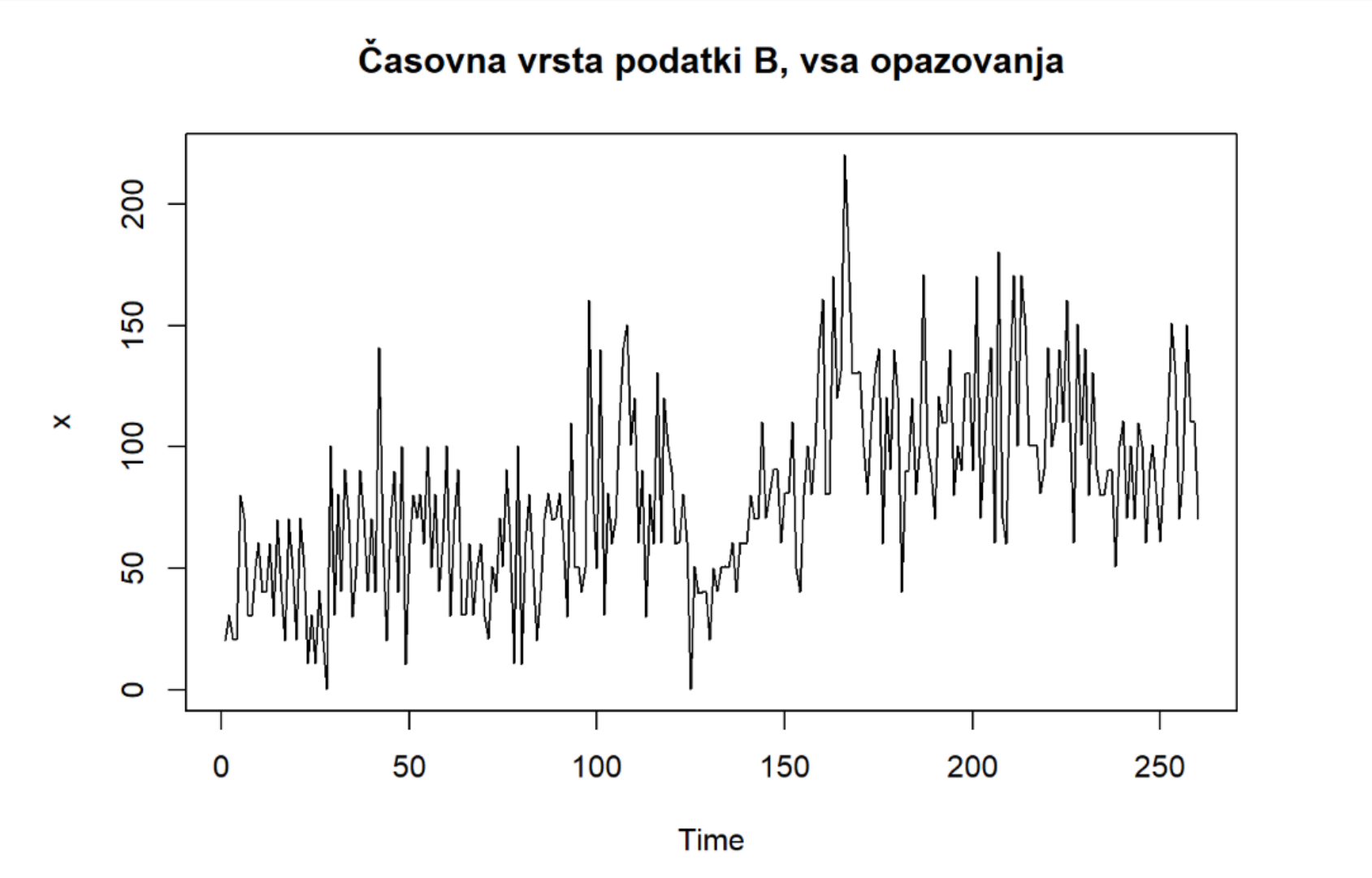


Gaussova napoved

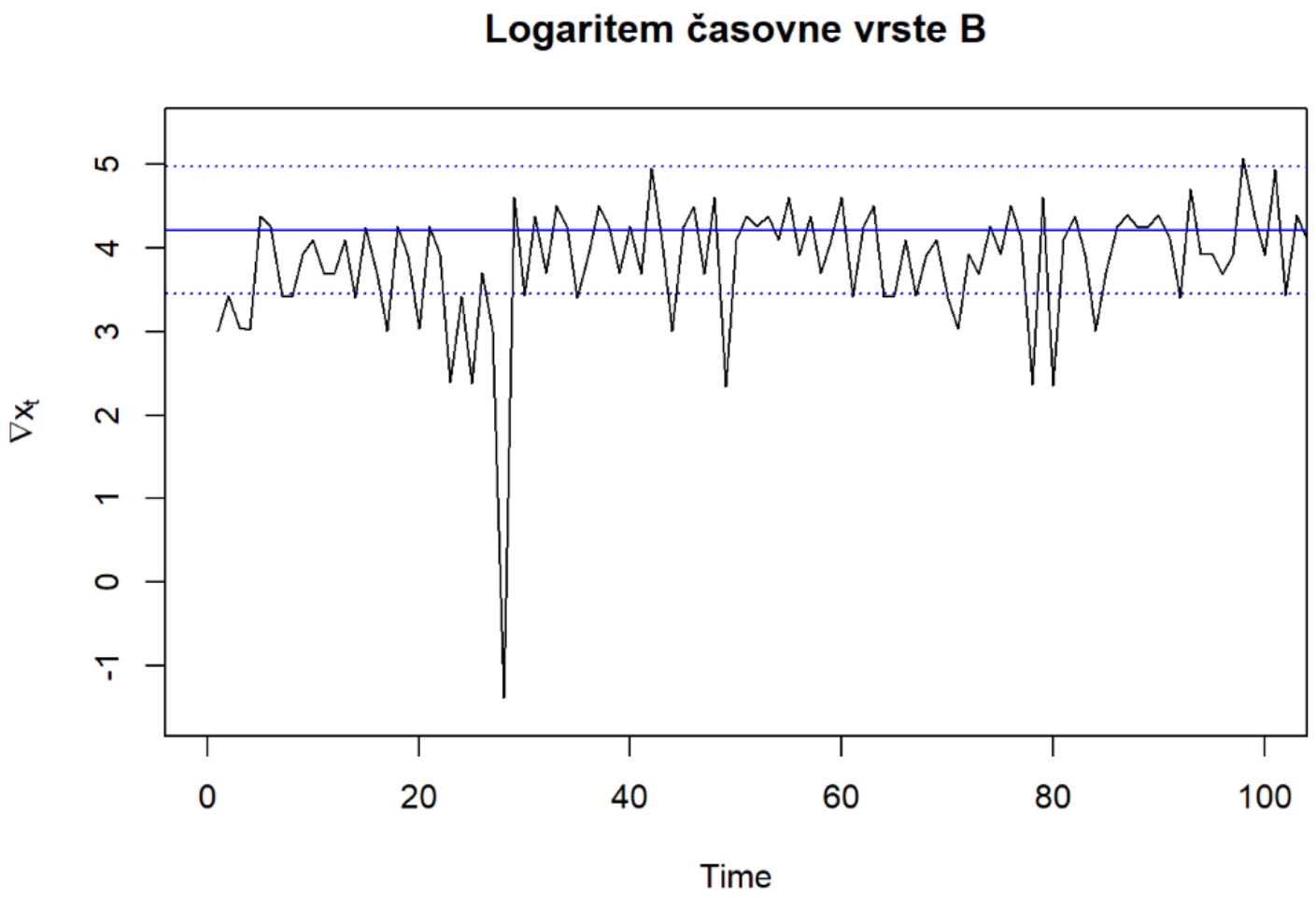


Časovna vrsta B

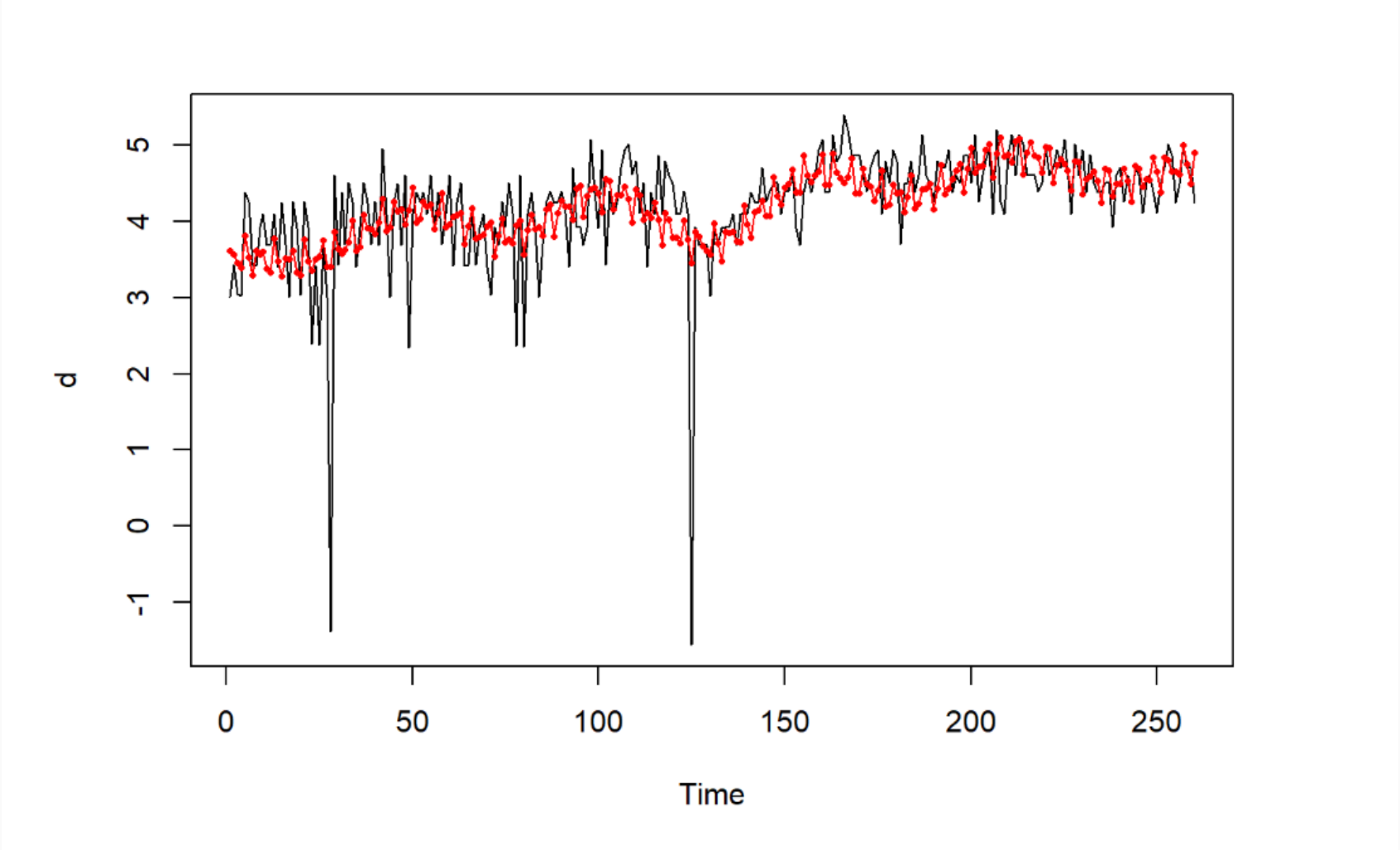
Časovna vrsta B



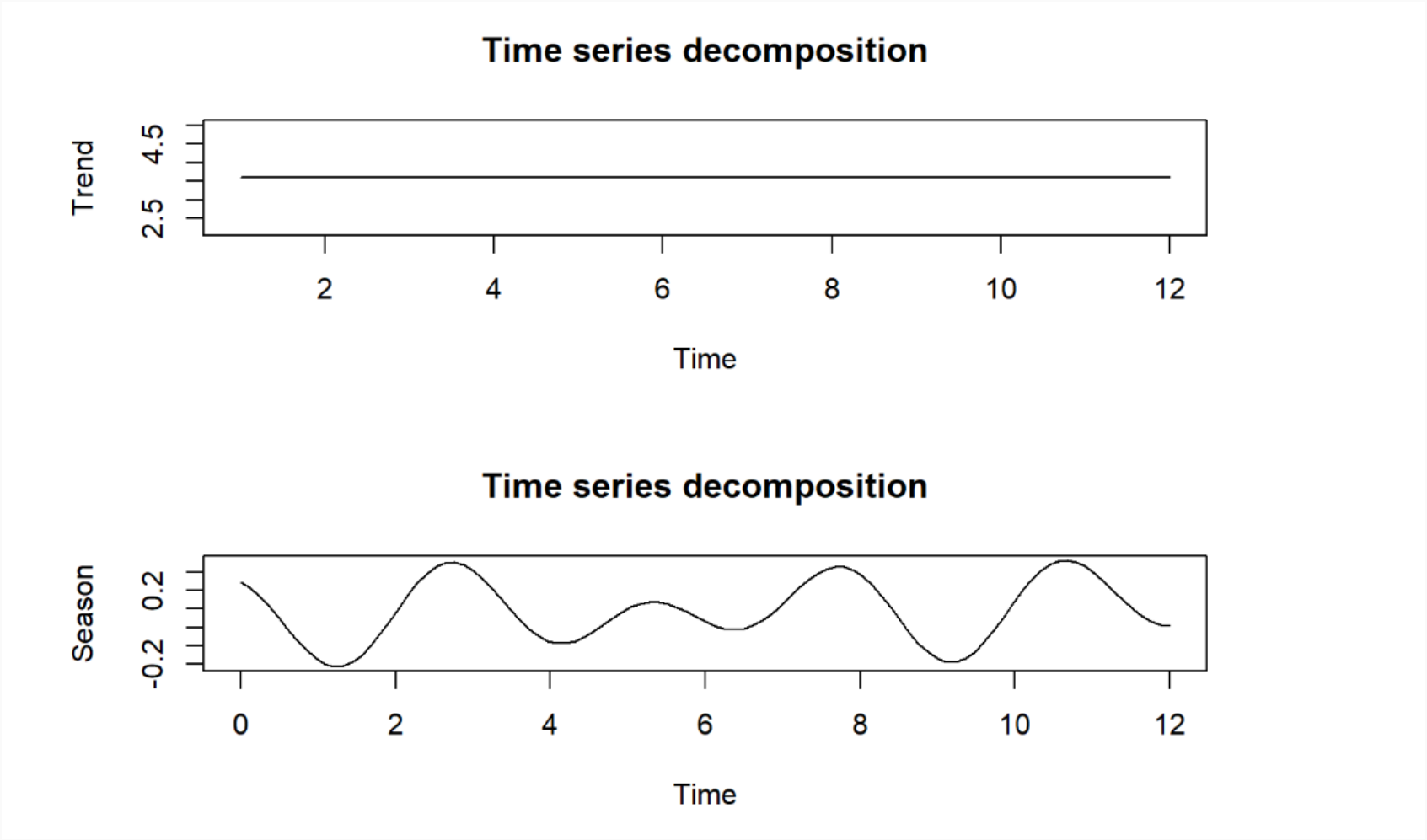
Logaritmirana časovna vrsta B



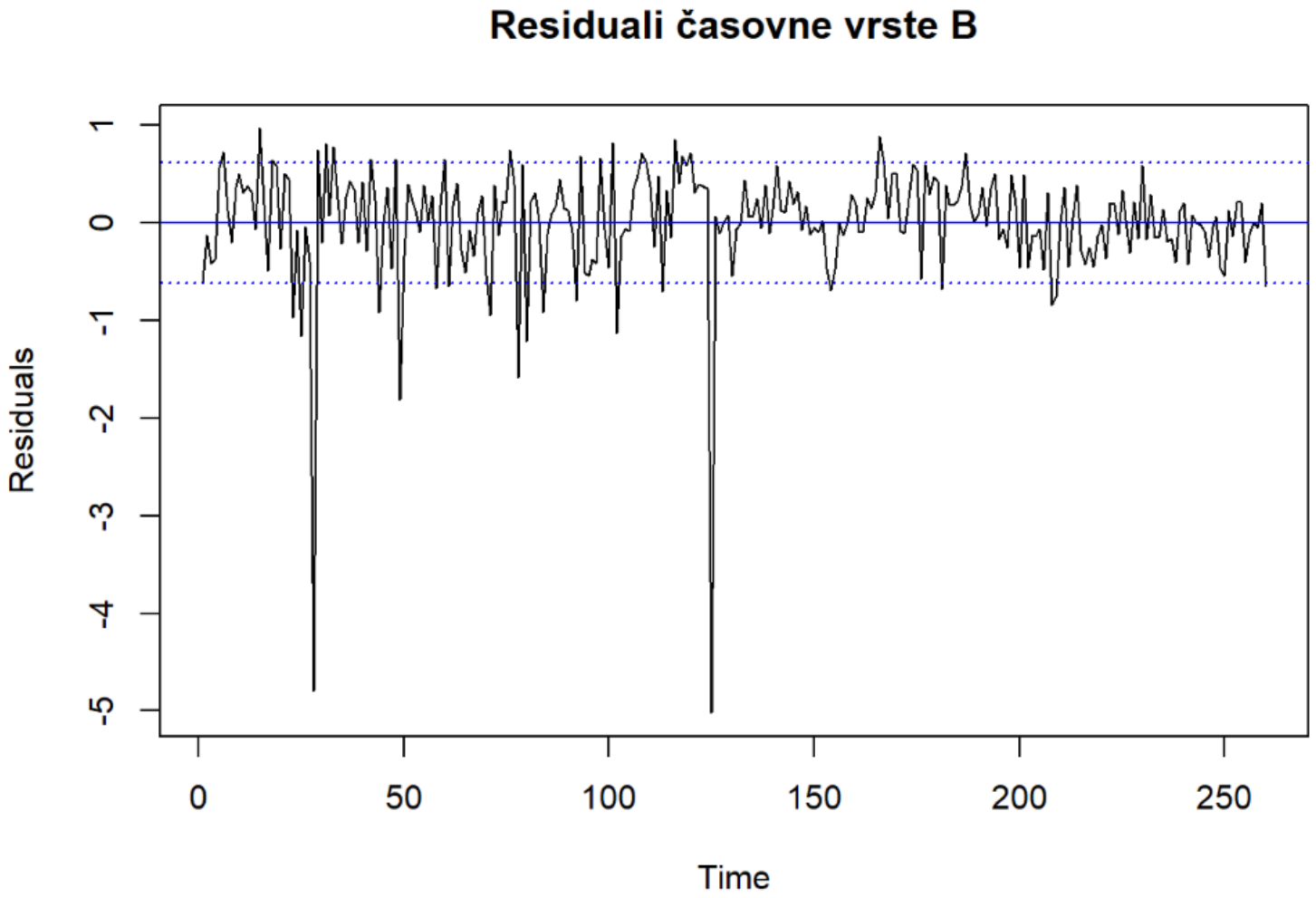
Harmonična regresija



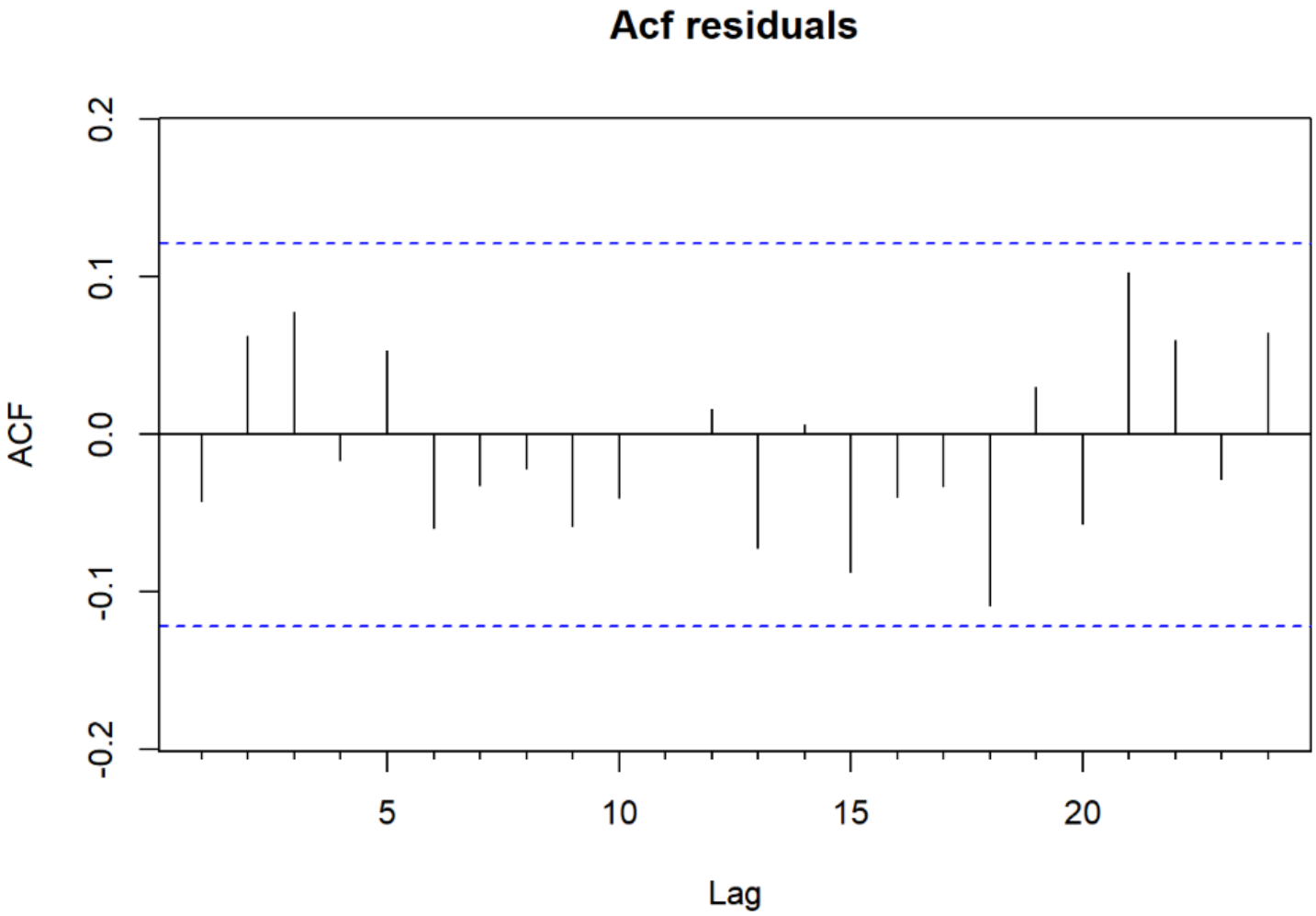
Trend in sezonskost - dekompozicija



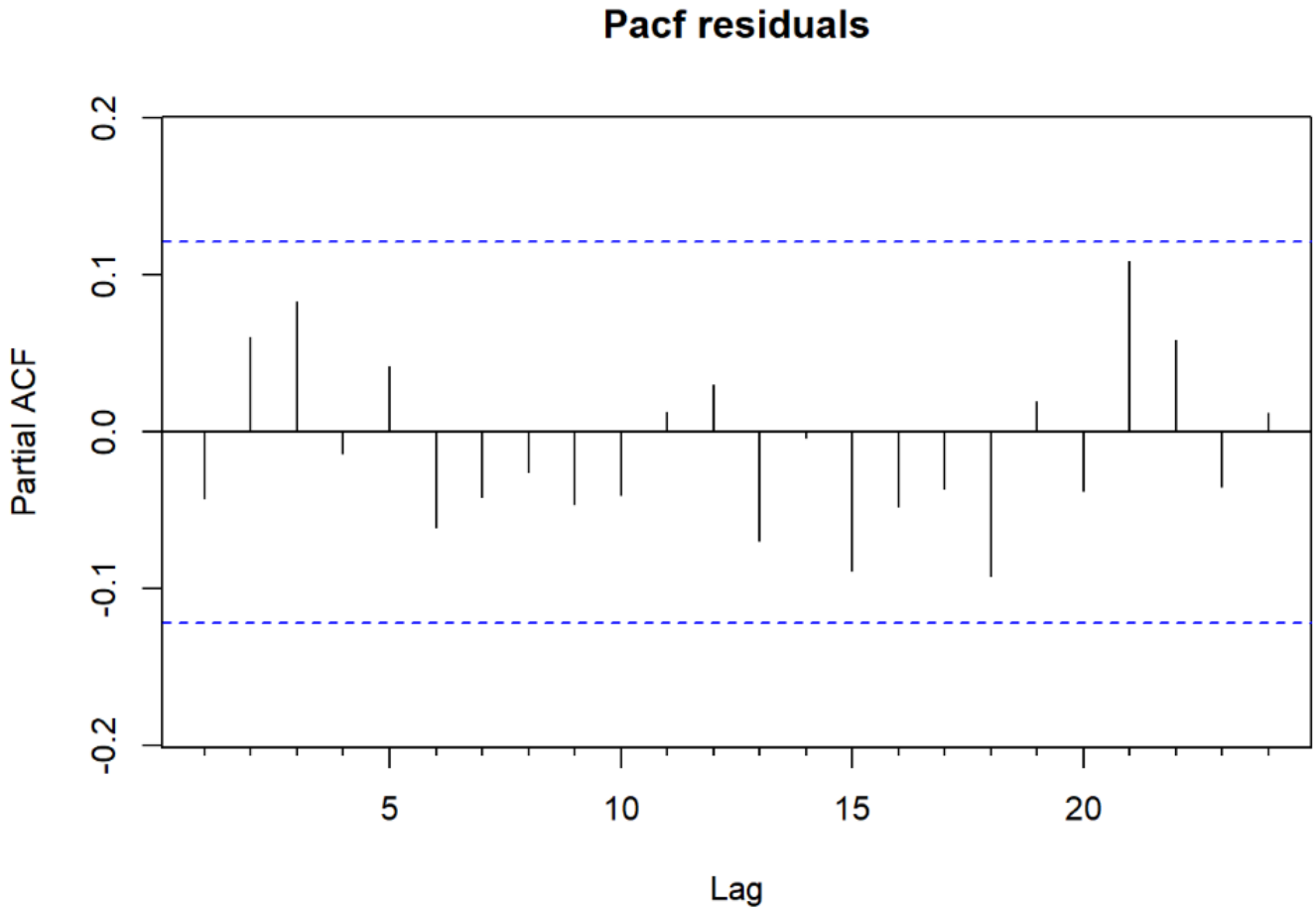
Residuali - stacionarnost



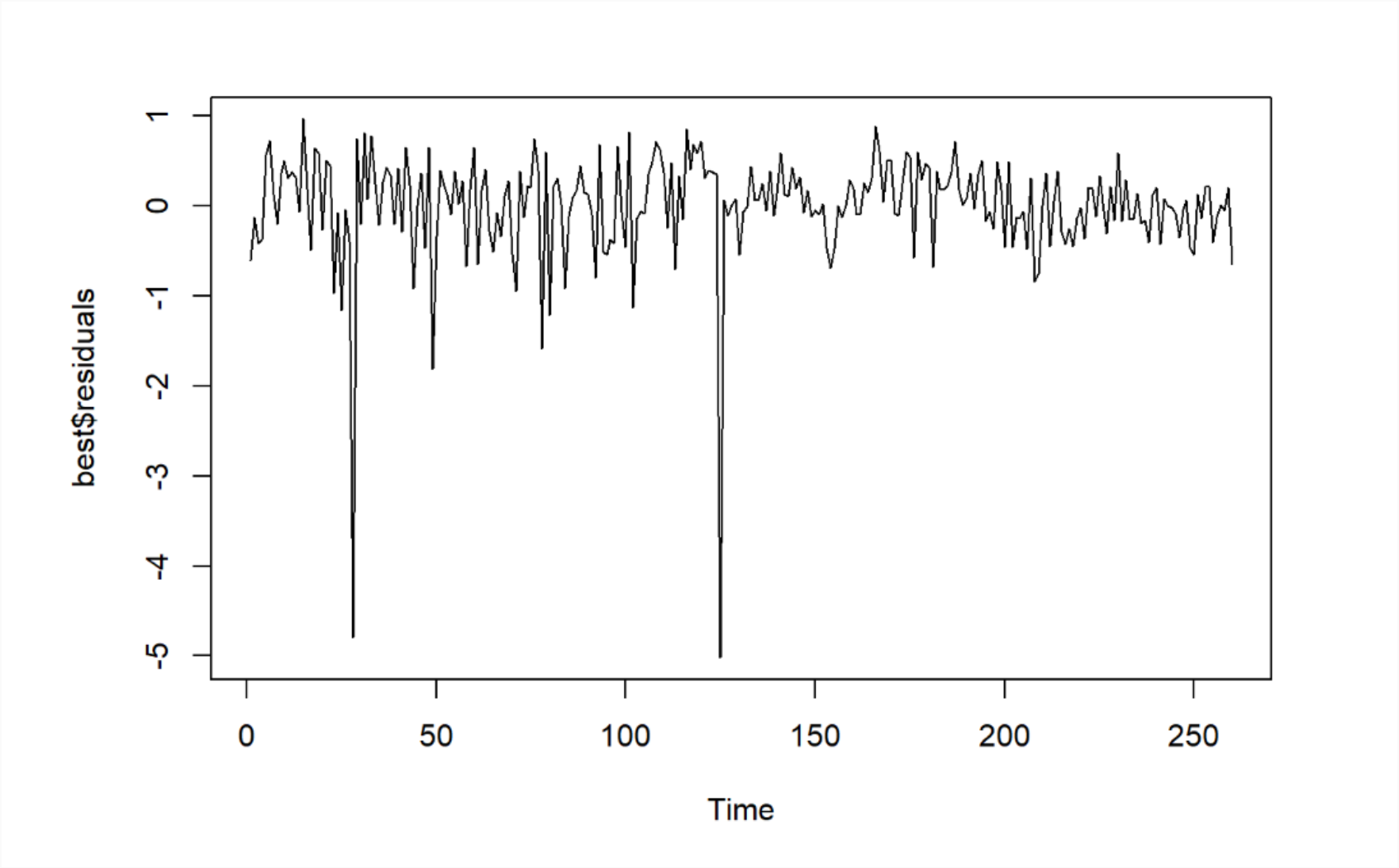
ACF



PACF



Residuali

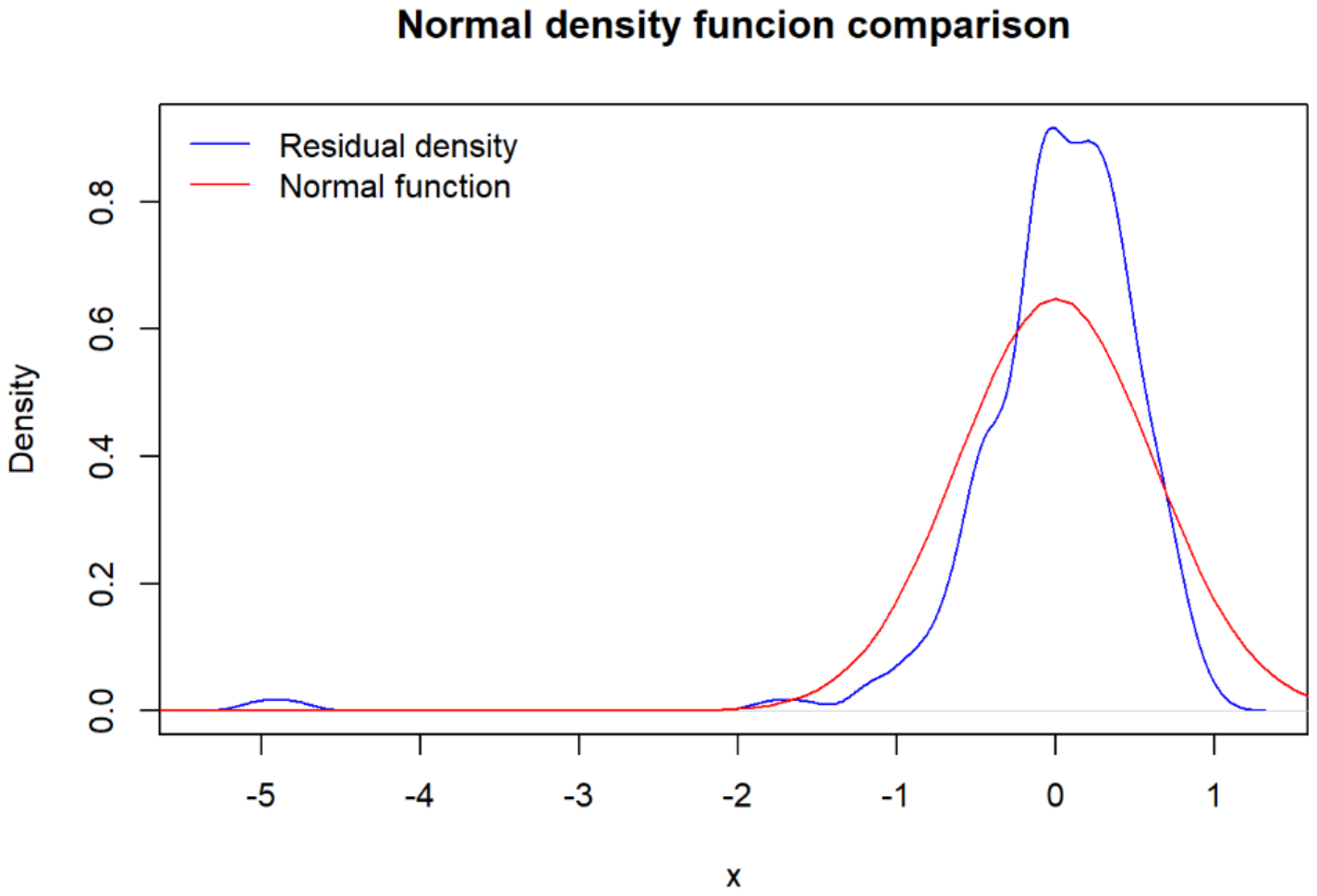


Izbira modela

```
##
## Call:
## arima(x = d.res, order = c(0, 0, 0))
##
## Coefficients:
##       intercept
##          0.0000
## s.e.     0.0381
##
## sigma^2 estimated as 0.378:  log likelihood = -242.45,  aic = 488.91
```

```
## [1] "Algoritem vrne predlog za model ARMA(0,0)."
```

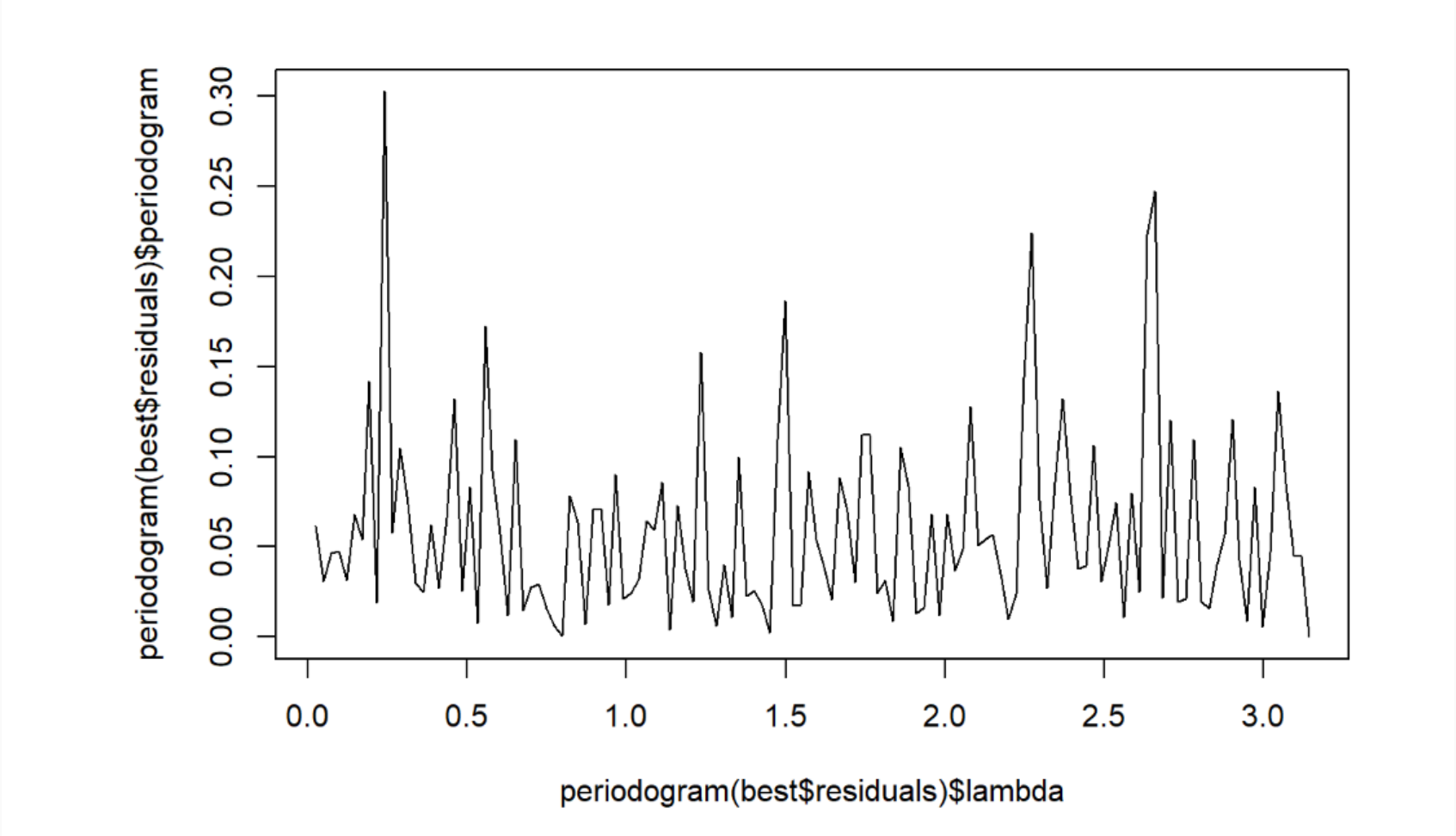
Test za normalno porazdelitev



Test za normalno porazdelitev

```
##
##  Shapiro-Wilk normality test
##
## data:  best$residuals
## W = 0.71579, p-value < 2.2e-16
```

White Noise


periodogram(best$residuals)$periodogram
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.0
0.5
1.0
1.5
2.0
2.5
3.0
periodogram(best$residuals)$lambda

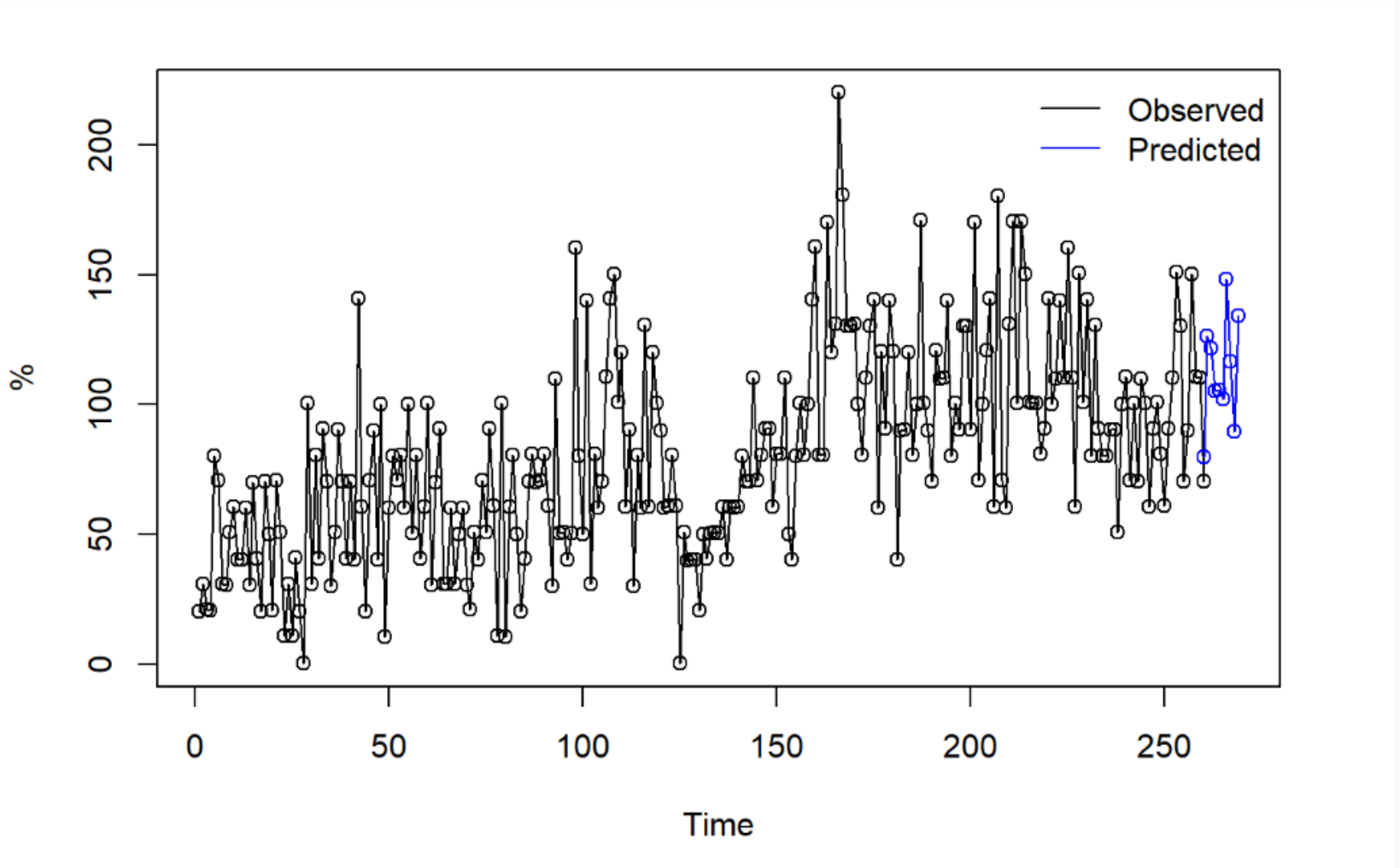
White Noise

```
##
##  Box-Pierce test
##
## data:  d.res
## X-squared = 0.46321, df = 1, p-value = 0.4961
```

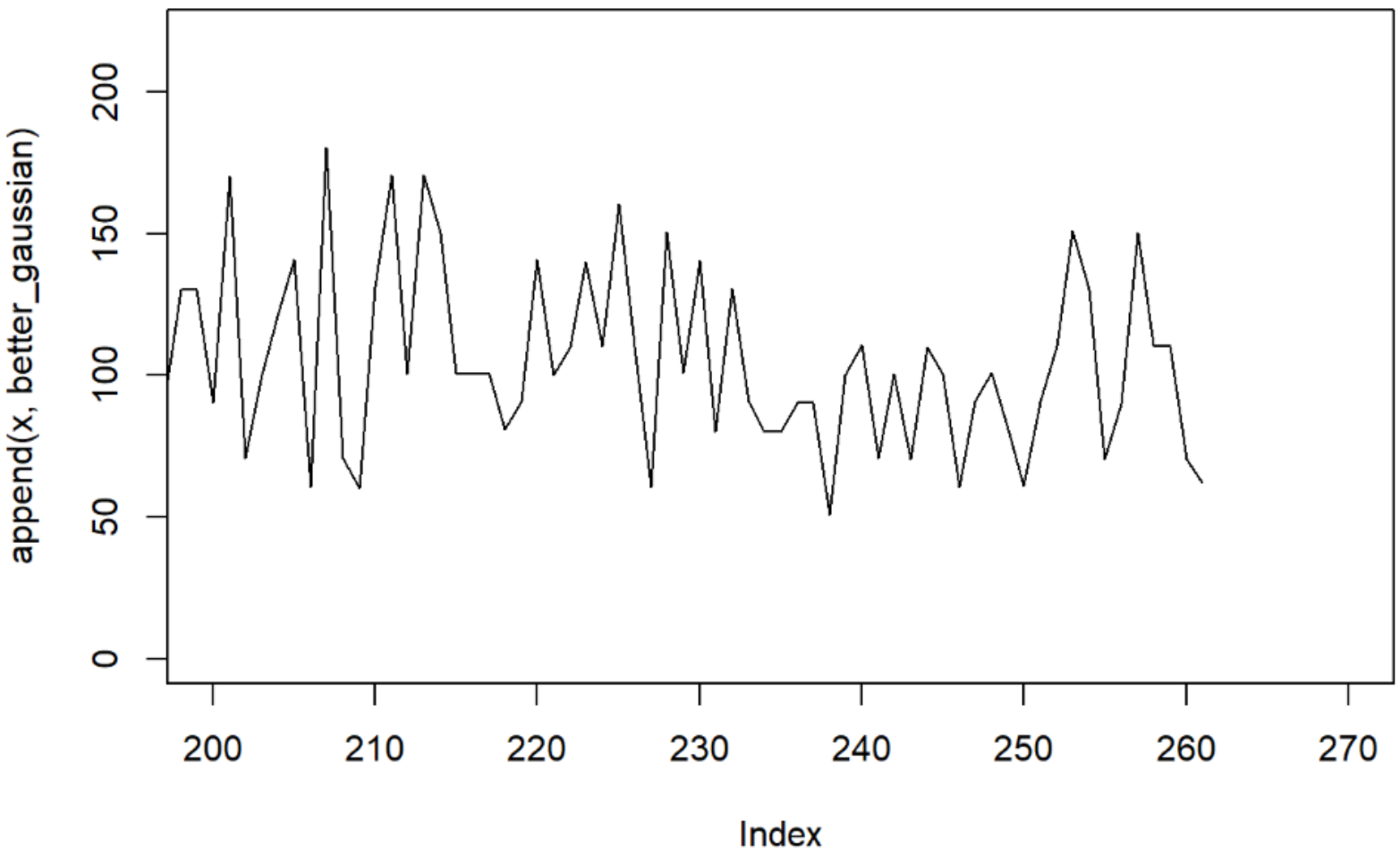
```
##
##  Box-Ljung test
##
## data:  d.res
## X-squared = 0.46858, df = 1, p-value = 0.4936
```

```
## [1] "Imamo white noise!"
```

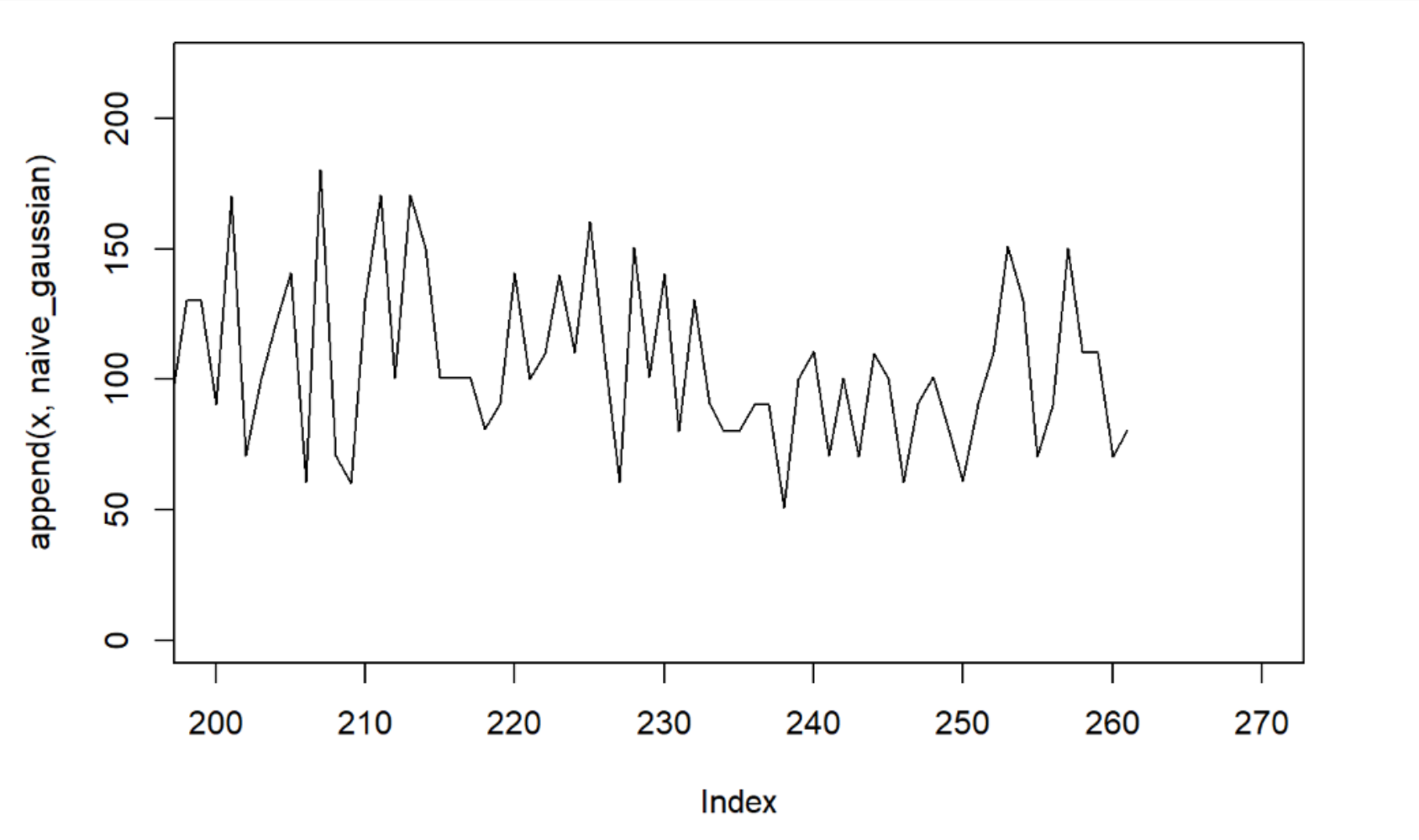
Napoved časovne vrste B



Gaussova napoved



Gaussova napoved



Gaussova napoved