

STAT556_HW1

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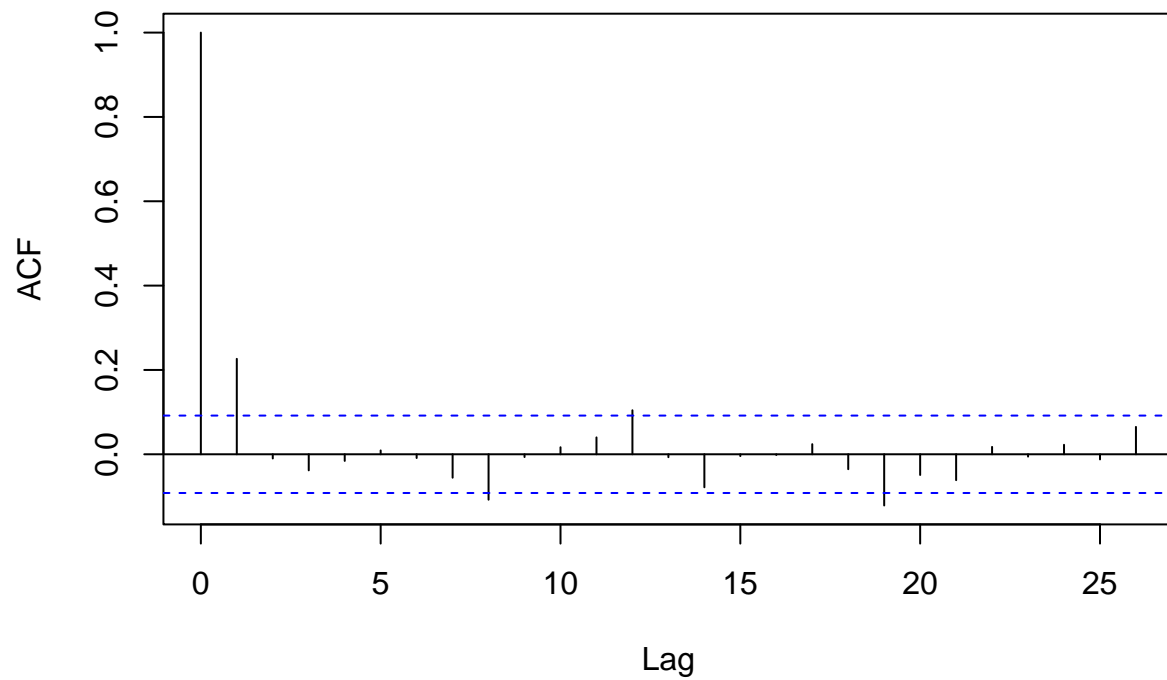
2024-09-11

```
library(LSTS)
```

```
## Warning: package 'LSTS' was built under R version 4.3.3
```

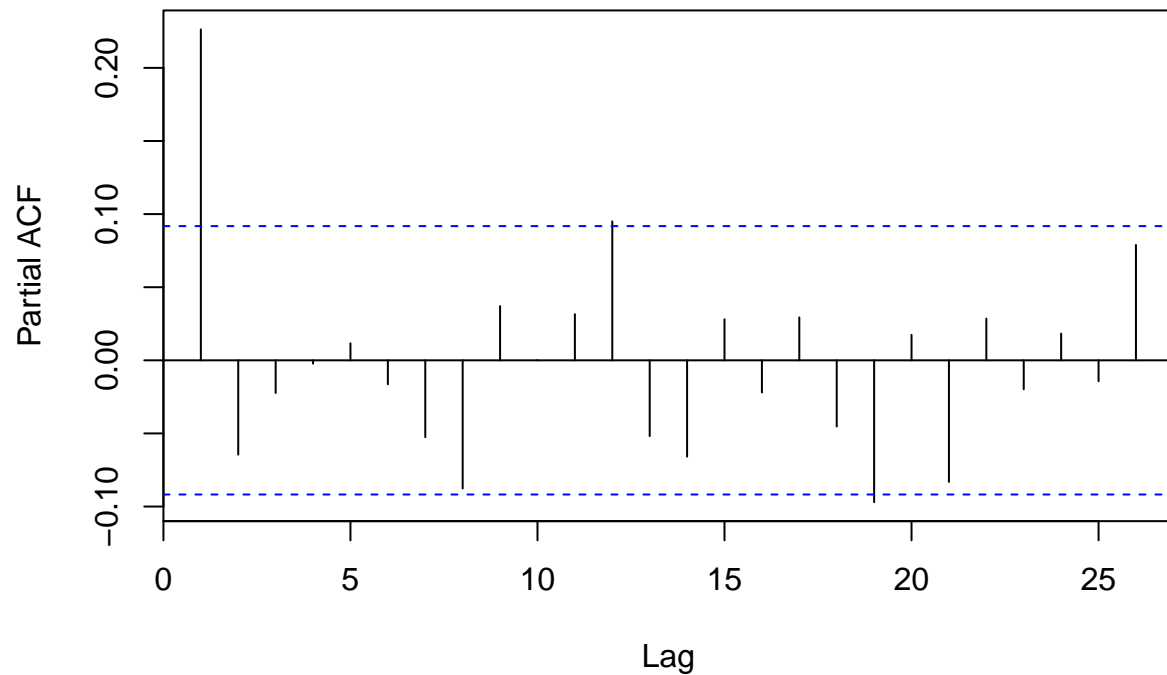
```
data = read.csv("m-ew6299-1.txt", header=FALSE)  
acf(data)
```

V1



```
pacf(data)
```

Series data



#AR(1)

```
ar_model = arima(data, order=c(1,0,0))
ar_model
```

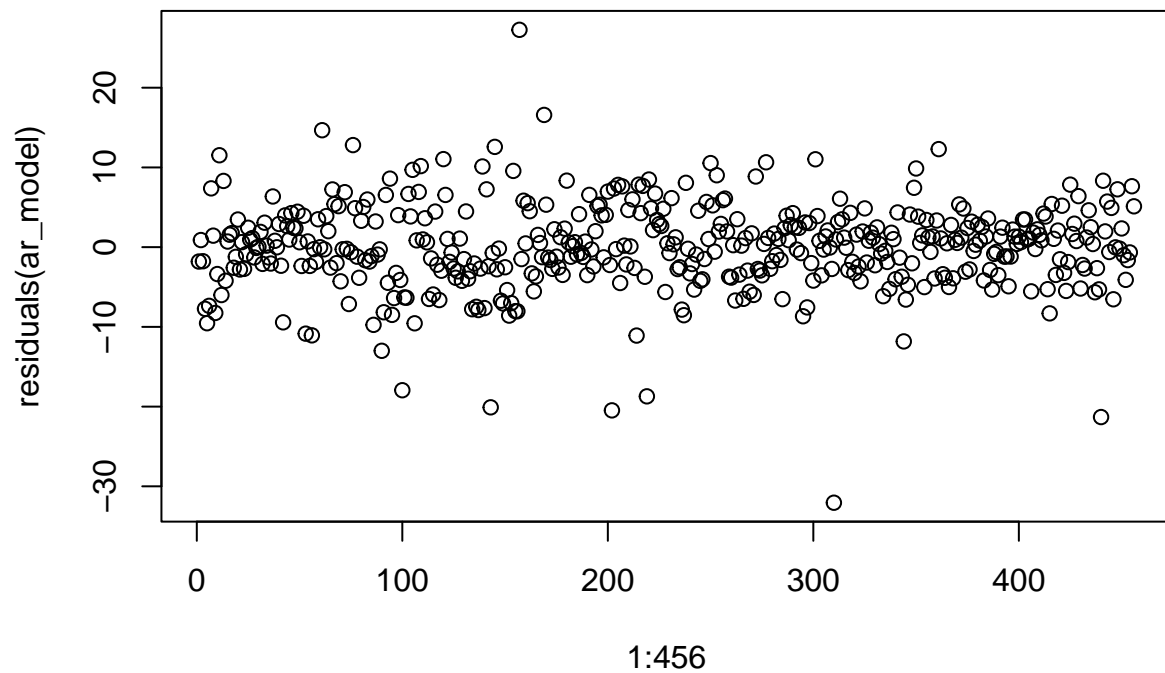
```
##
## Call:
## arima(x = data, order = c(1, 0, 0))
##
## Coefficients:
##      ar1  intercept
##      0.2267    1.0626
## s.e.  0.0456    0.3297
##
## sigma^2 estimated as 29.68:  log likelihood = -1420.11,  aic = 2846.22
```

```
predict(ar_model, n.ahead = 2)
```

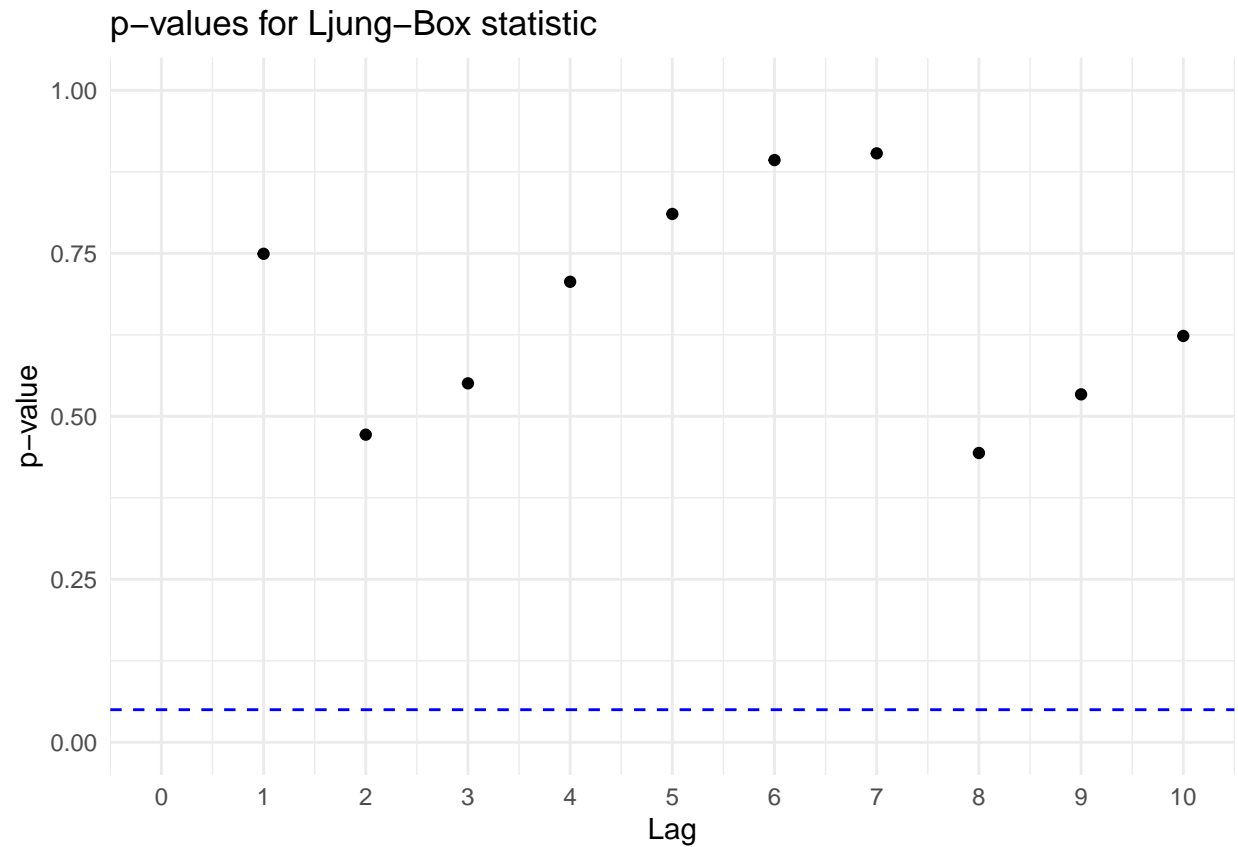
```
## $pred
## Time Series:
## Start = 457
## End = 458
## Frequency = 1
## [1] 2.601682 1.411453
##
```

```
## $se  
## Time Series:  
## Start = 457  
## End = 458  
## Frequency = 1  
## [1] 5.448175 5.586364
```

```
plot(1:456, residuals(ar_model))
```



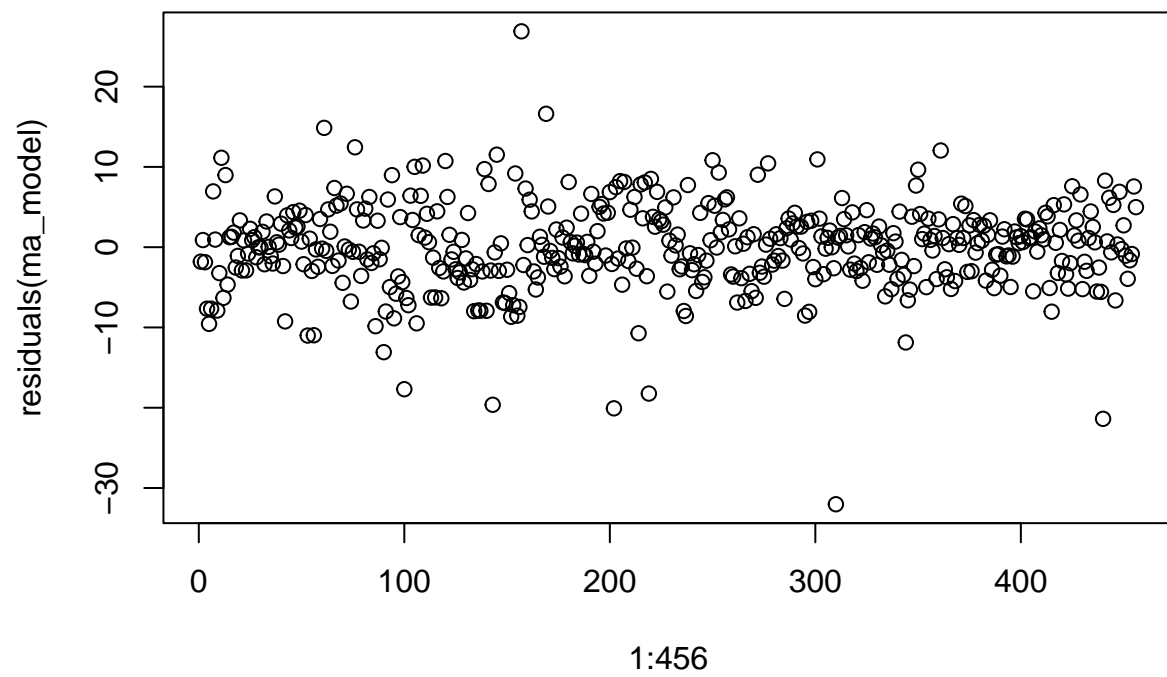
```
Box.Ljung.Test(residuals(ar_model), lag = 10)
```

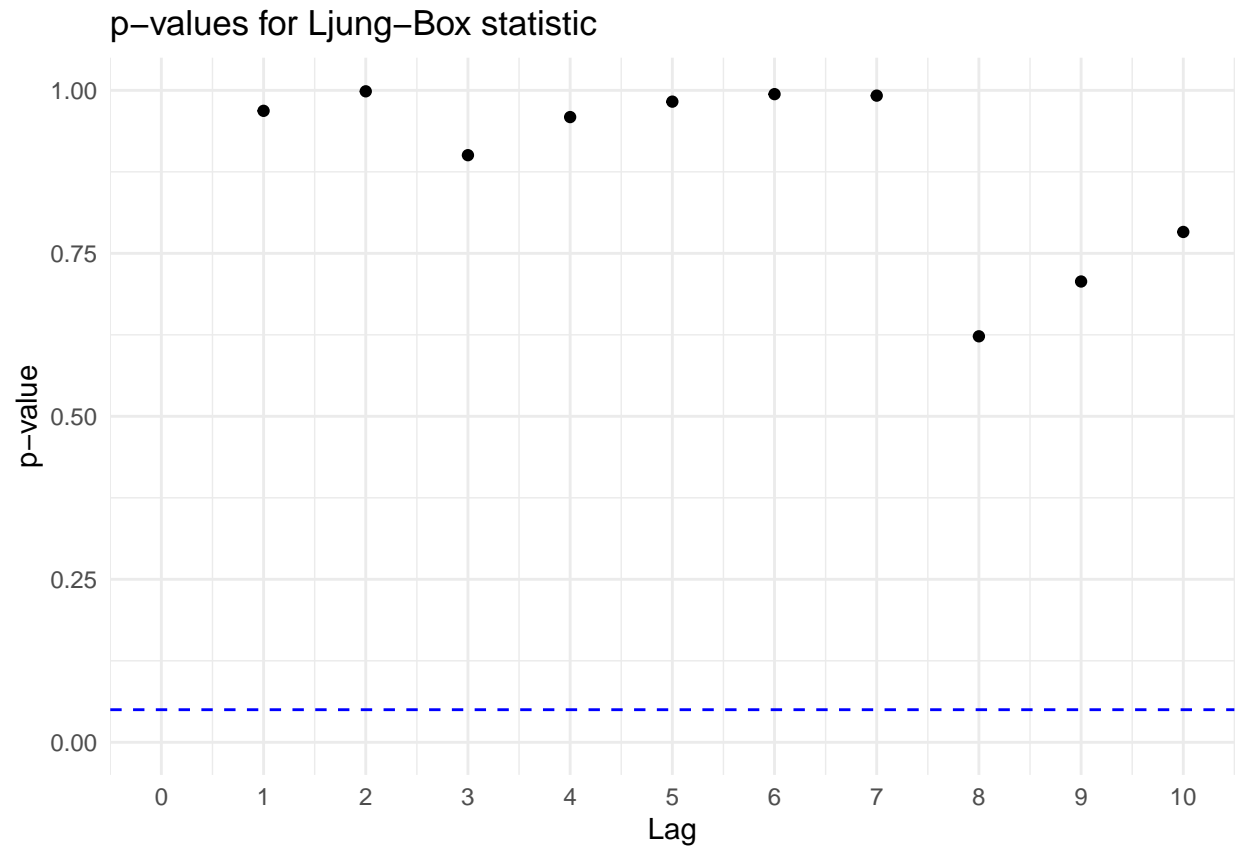


```
#MA(1)
```

```
##
## Call:
## arima(x = data, order = c(0, 0, 1))
##
## Coefficients:
##      ma1  intercept
##    0.2385    1.0605
## s.e. 0.0449    0.3153
##
## sigma^2 estimated as 29.59:  log likelihood = -1419.37,  aic = 2844.73

## $pred
## Time Series:
## Start = 457
## End = 458
## Frequency = 1
## [1] 2.250303 1.060512
##
## $se
## Time Series:
## Start = 457
## End = 458
## Frequency = 1
## [1] 5.439245 5.591797
```





#ANSWER2.13.d: In terms of AIC, MA(1) model better fits the data than the AR(1).