

Homework 3

Austin Sell

May 24, 2018

Part A

```
data <- read.csv("Data/statehouse.csv")
data <- subset(data, data$GovCycle==1)
data <- subset(data, data$HouseTerm==2)

data$DemHouseShareL1 <- lagpanel(data$DemHouseShare, data$FIPS, data$Year, 1)
data$DemHouseShareL2 <- lagpanel(data$DemHouseShare, data$FIPS, data$Year, 2)
data$DemHouseShareL3 <- lagpanel(data$DemHouseShare, data$FIPS, data$Year, 3)
data$DemHouseShareL4 <- lagpanel(data$DemHouseShare, data$FIPS, data$Year, 4)
```

Part B

```
statelist <- unique(data$State)
data.state <- NULL
adf.pvalue <- NULL
pp.pvalue <- NULL
adf.pvalue.dt <- NULL
pp.pvalue.dt <- NULL

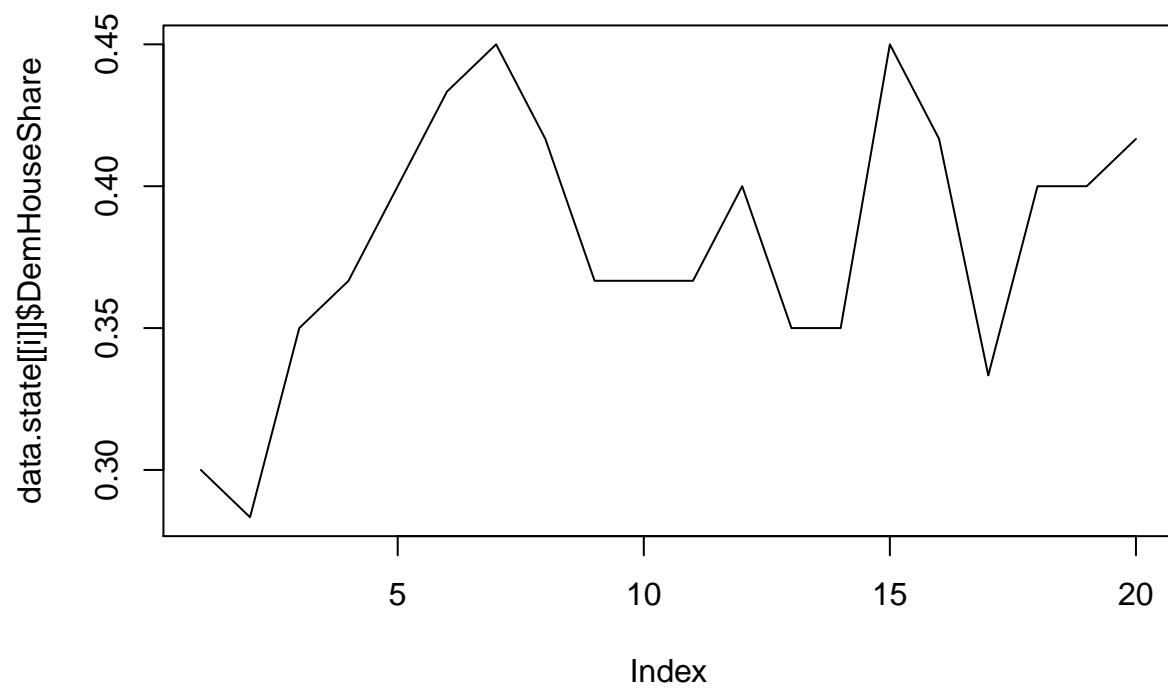
for (i in 1:length(statelist)){
  data.state[[i]] <- subset(data, data$State==statelist[i])

  plot(data.state[[i]]$DemHouseShare, type="l")
  acf(data.state[[i]]$DemHouseShare)
  pacf(data.state[[i]]$DemHouseShare)

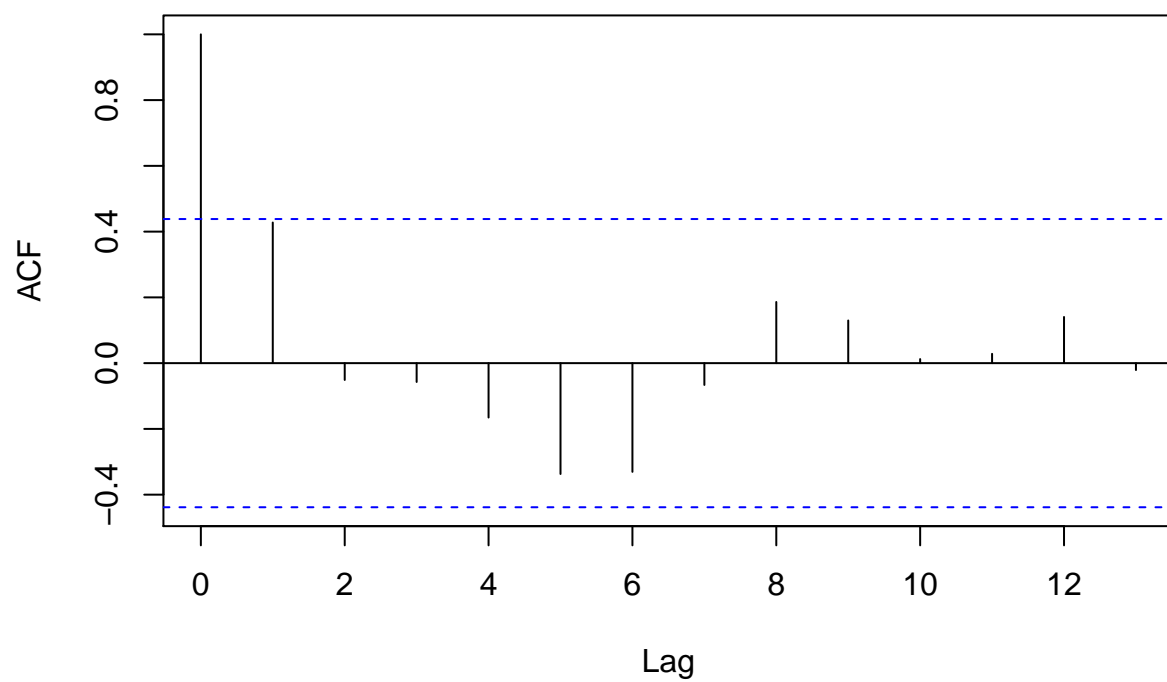
  plot(detrend.ts(ts=data.state[[i]]$DemHouseShare, period=data.state[[i]]$Year), type="l")
  acf(detrend.ts(ts=data.state[[i]]$DemHouseShare, period=data.state[[i]]$Year))
  pacf(detrend.ts(ts=data.state[[i]]$DemHouseShare, period=data.state[[i]]$Year))

  adf.pvalue[i] <- adf.test(data.state[[i]]$DemHouseShare)$p.value
  pp.pvalue[i] <- pp.test(data.state[[i]]$DemHouseShare)$p.value

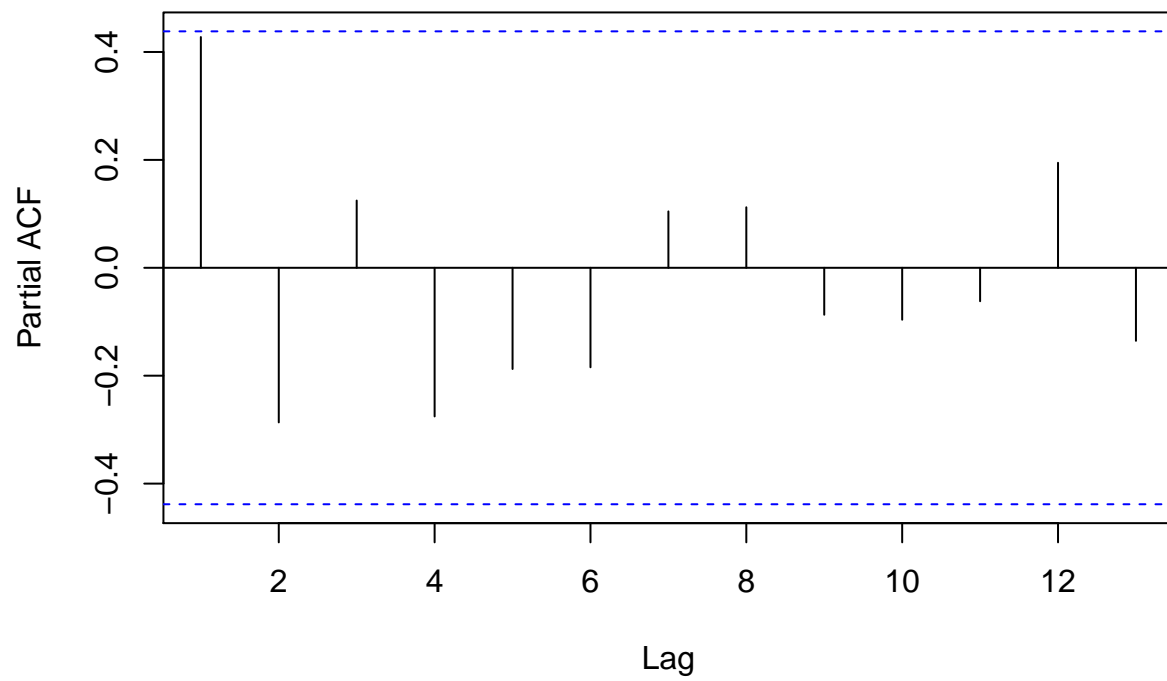
  adf.pvalue.dt[i] <- adf.test(detrend.ts(ts=data.state[[i]]$DemHouseShare, period=data.state[[i]]$Year))$p.value
  pp.pvalue.dt[i] <- pp.test(detrend.ts(ts=data.state[[i]]$DemHouseShare, period=data.state[[i]]$Year))$p.value
}
```



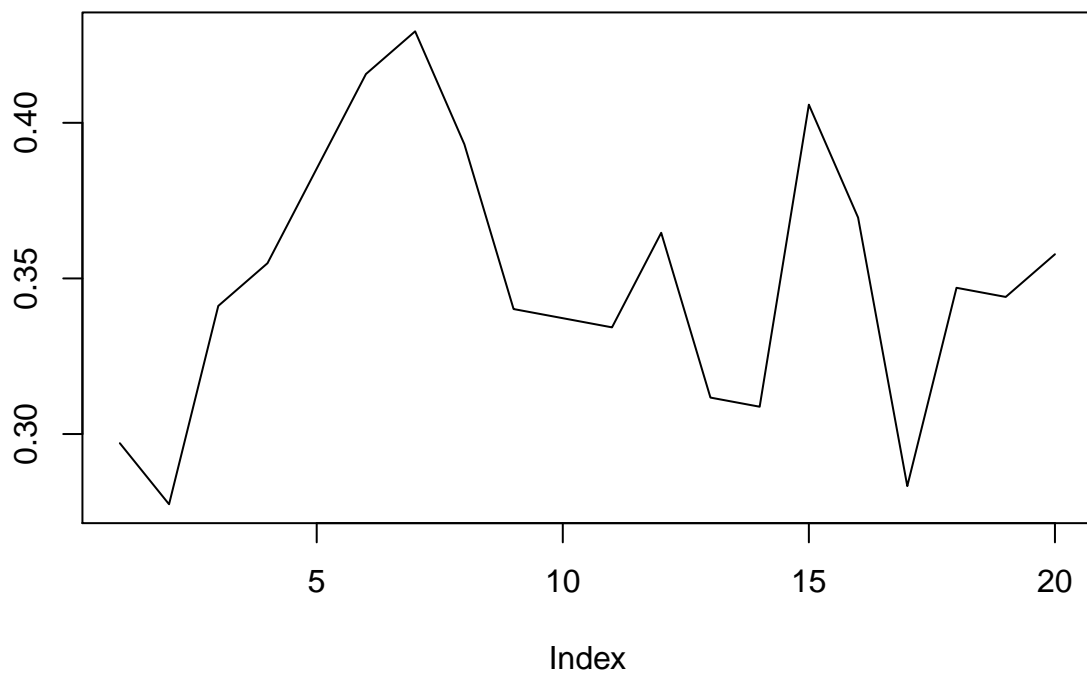
Series data.state[[i]]\$DemHouseShare



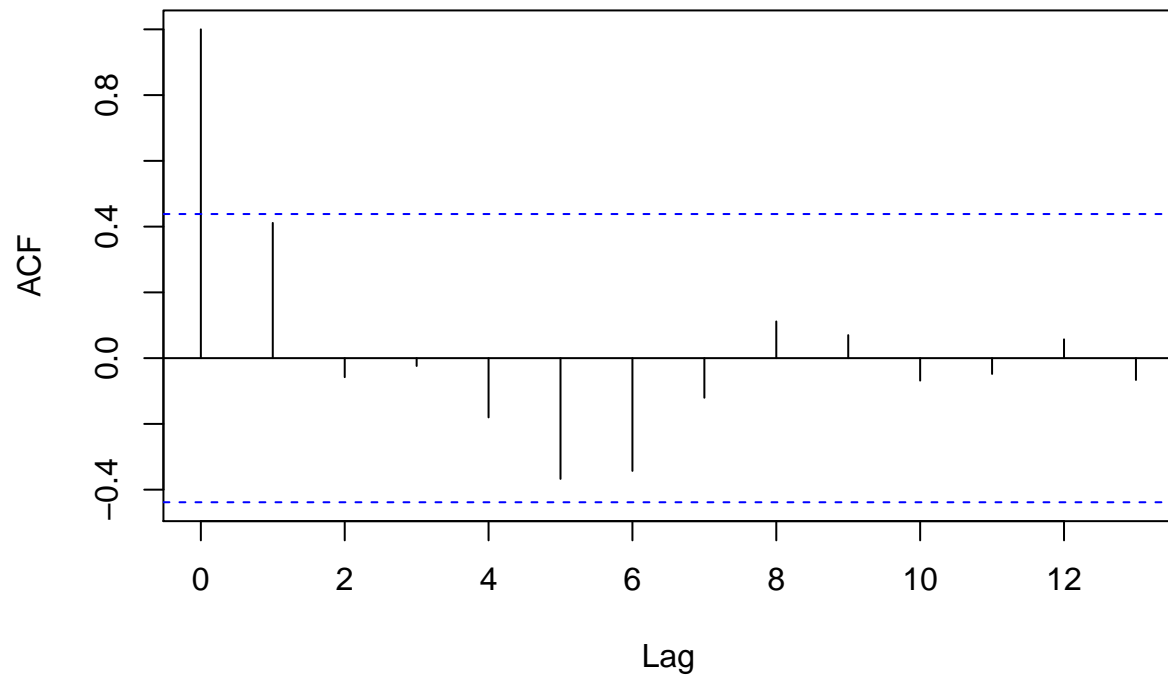
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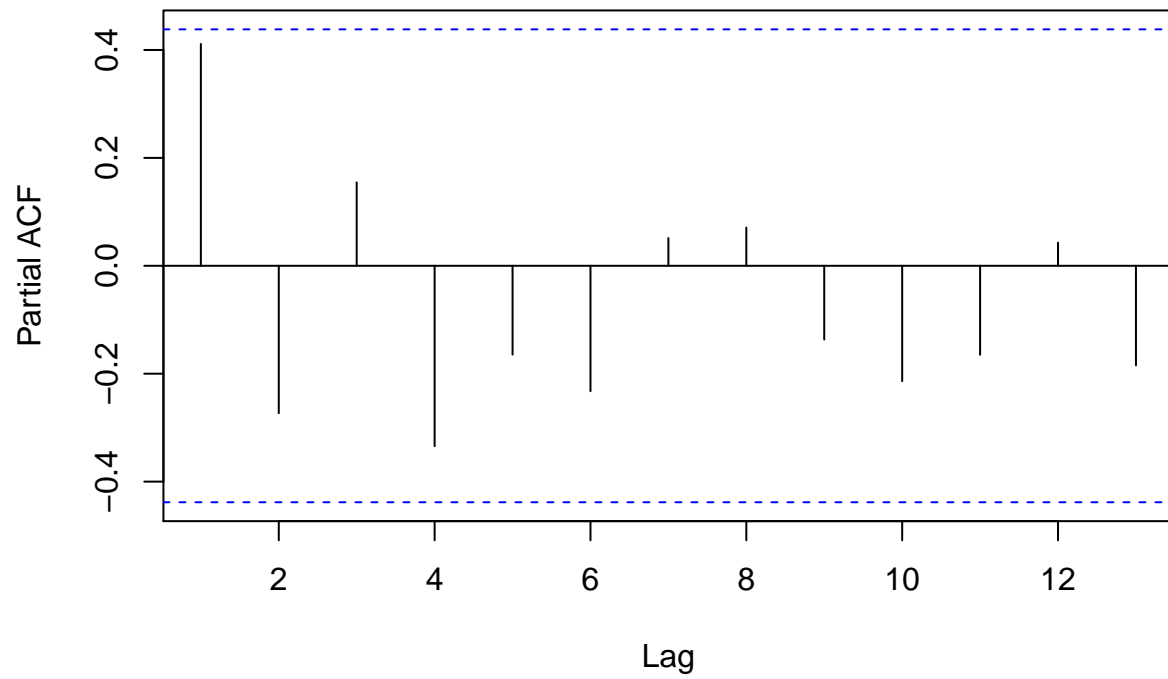
d.ts(ts = data.state[[i]]\$DemHouseShare, period = data.state[

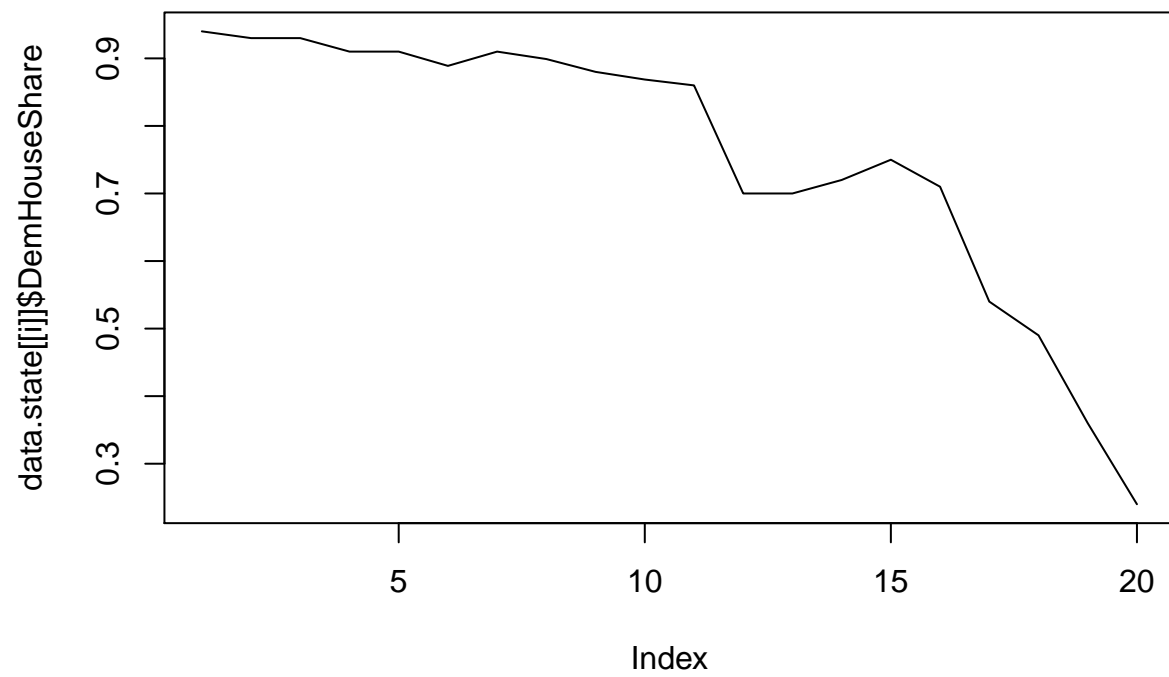


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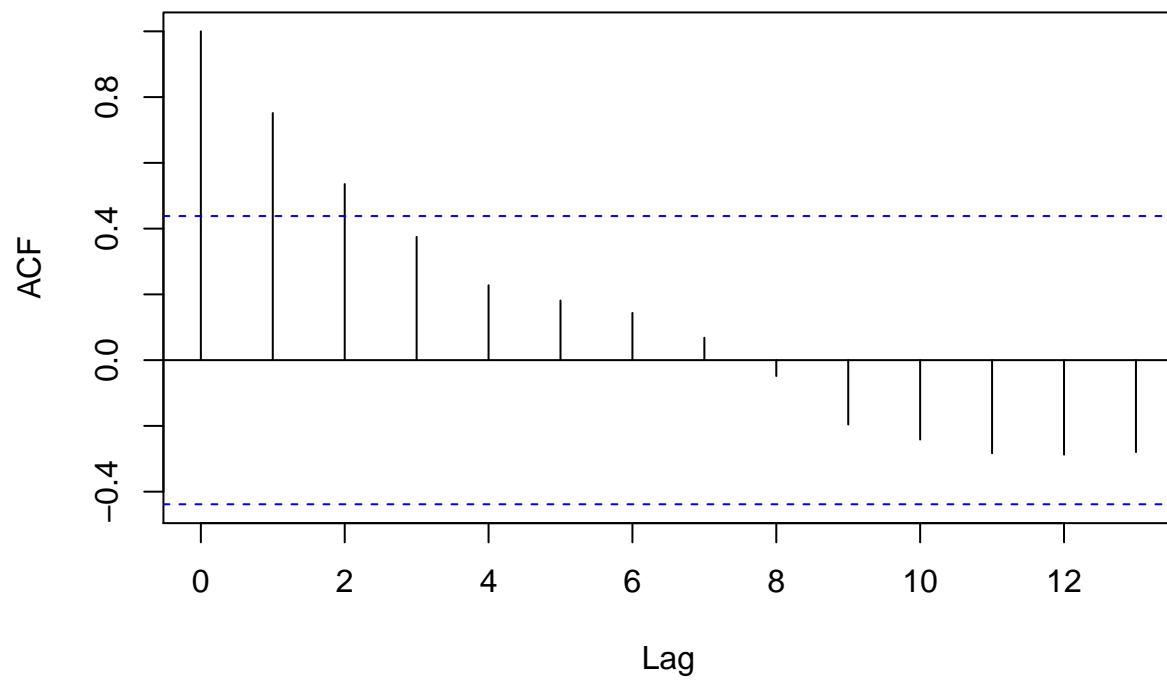


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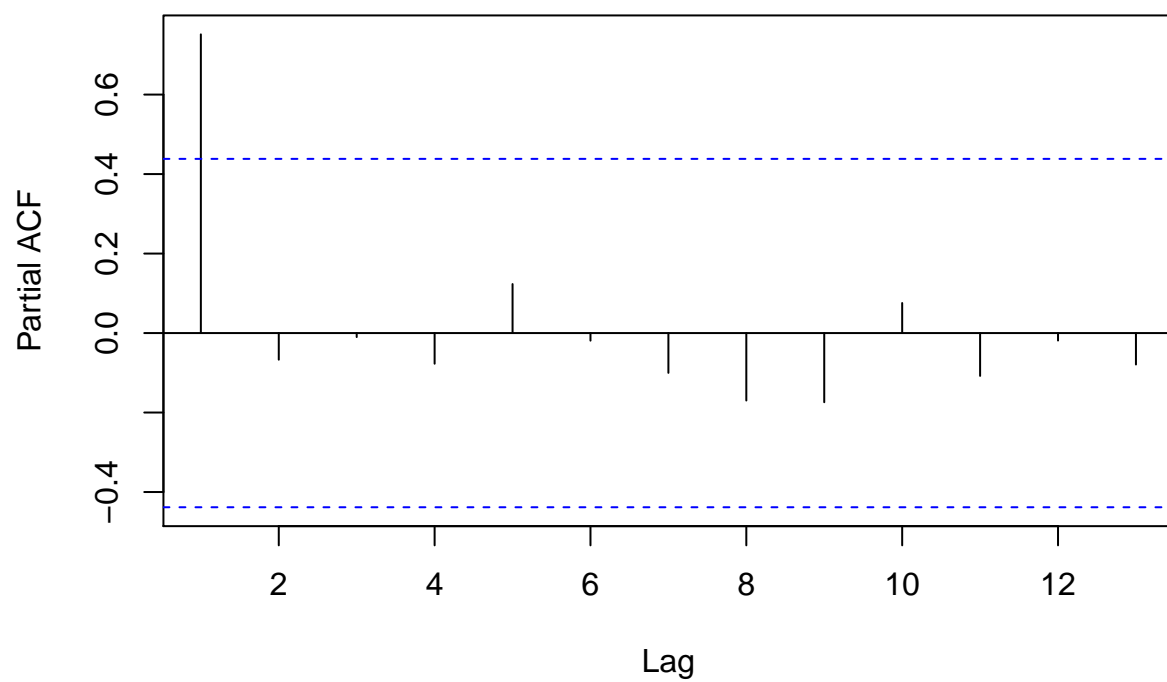




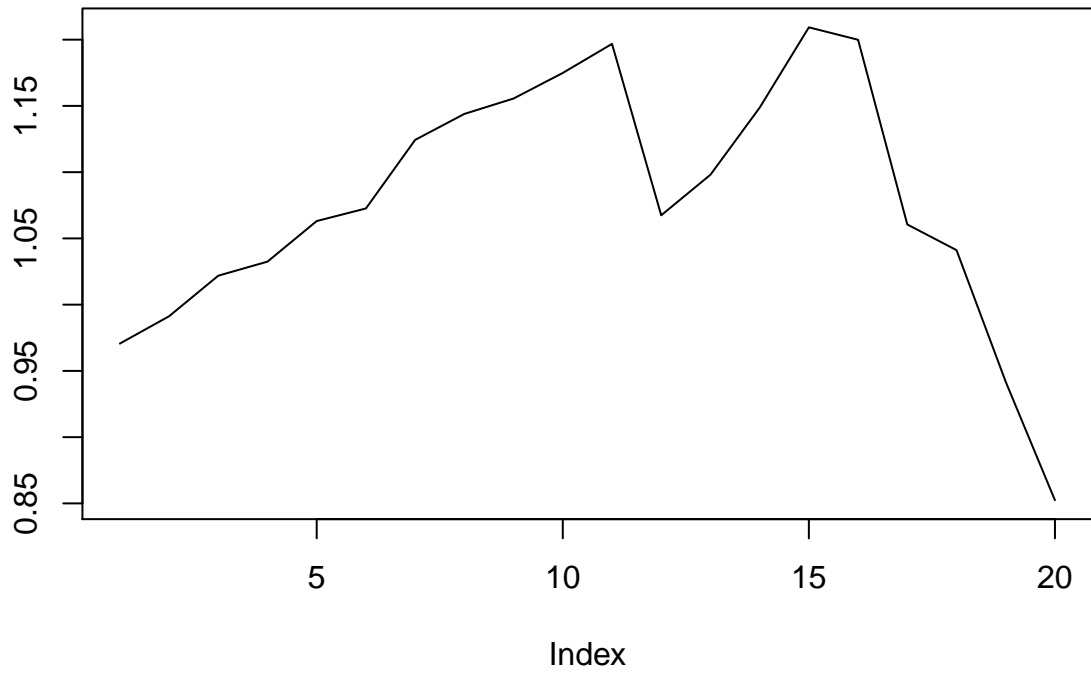
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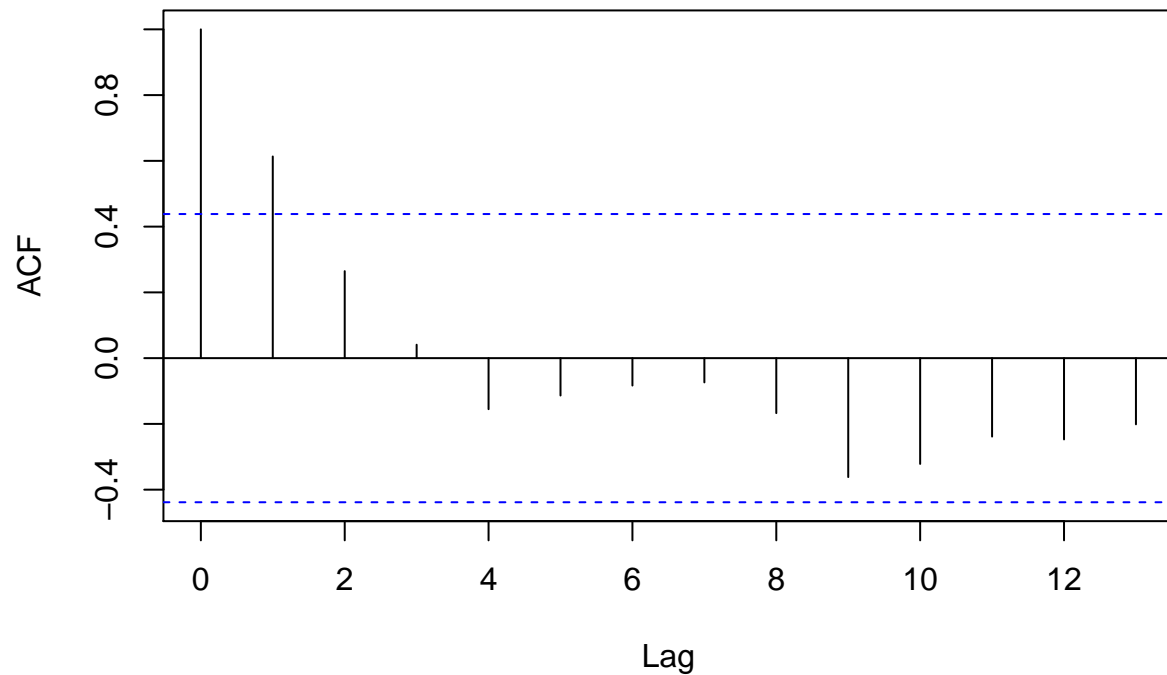
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d.ts(ts = data.state[[i]]\$DemHouseShare, period = data.state[



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as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[[i]]$Year)
```



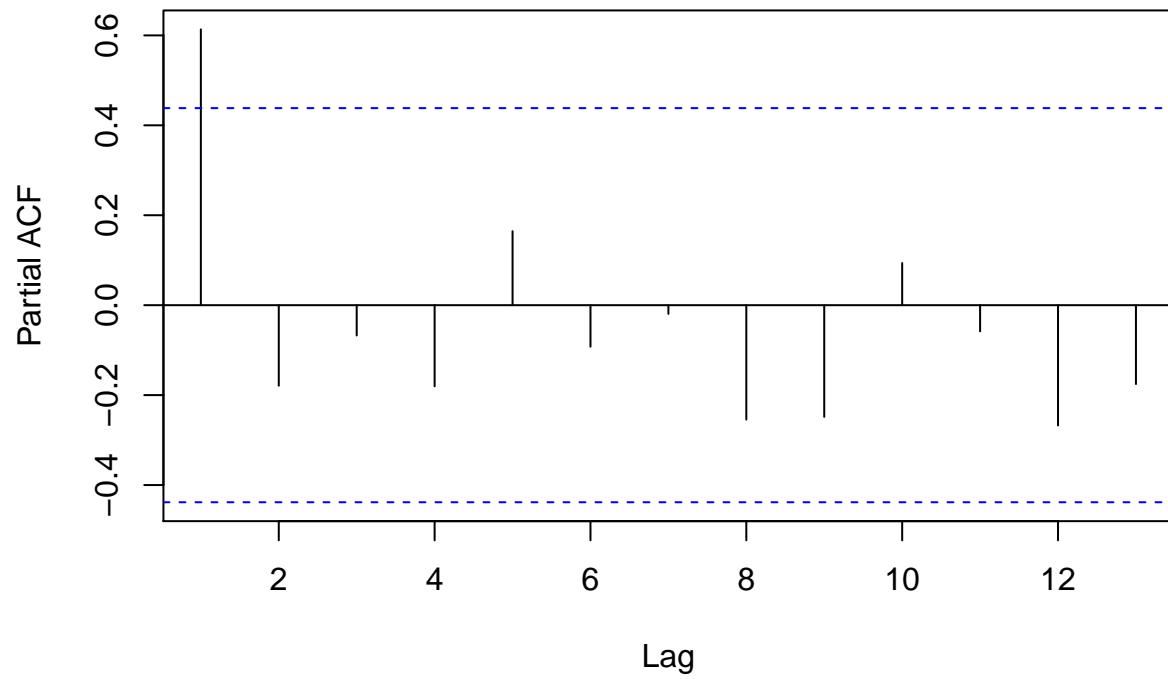
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## Warning in adf.test(data.state[[i]]$DemHouseShare): p-value greater than
## printed p-value

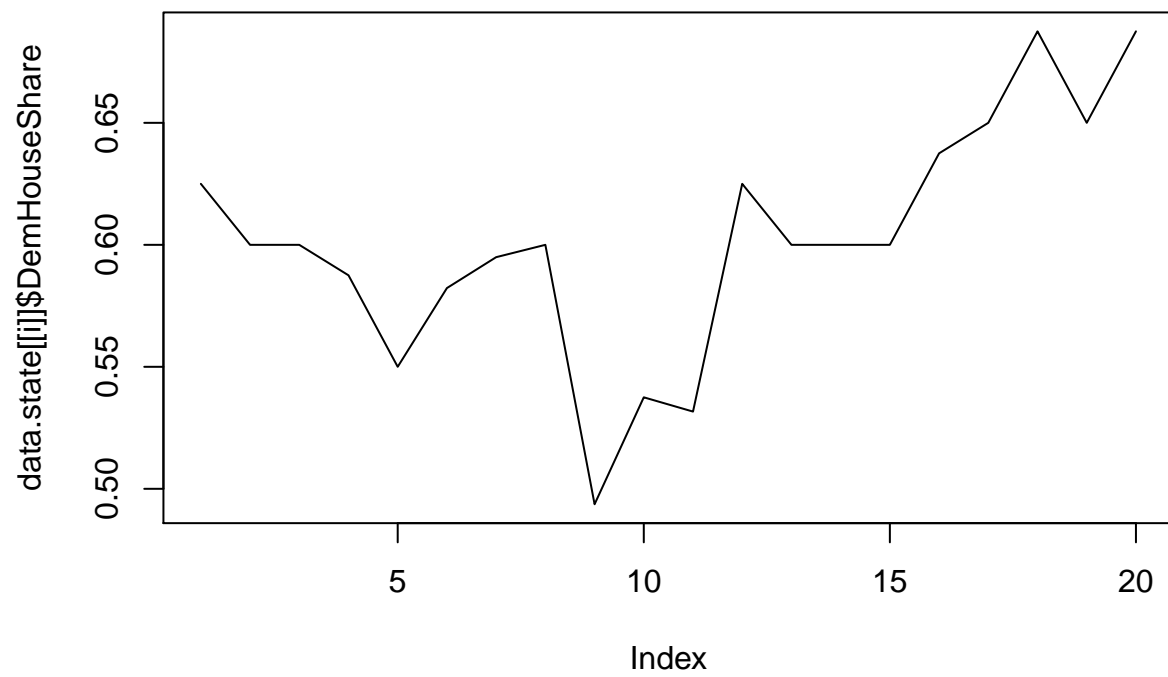
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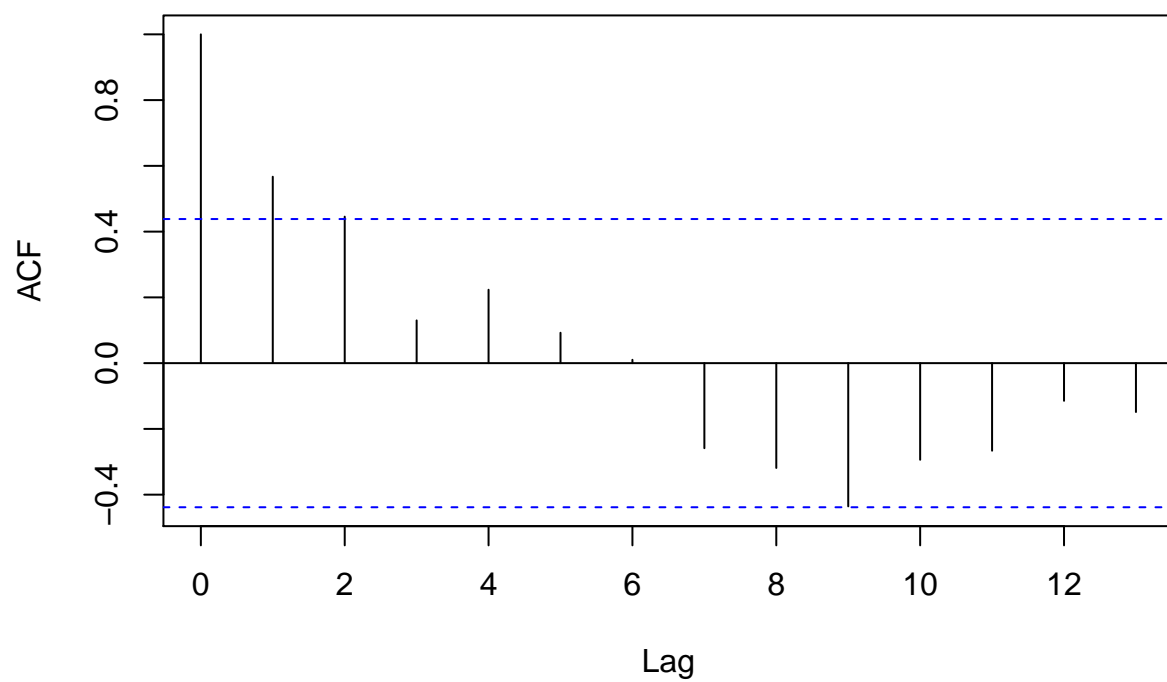
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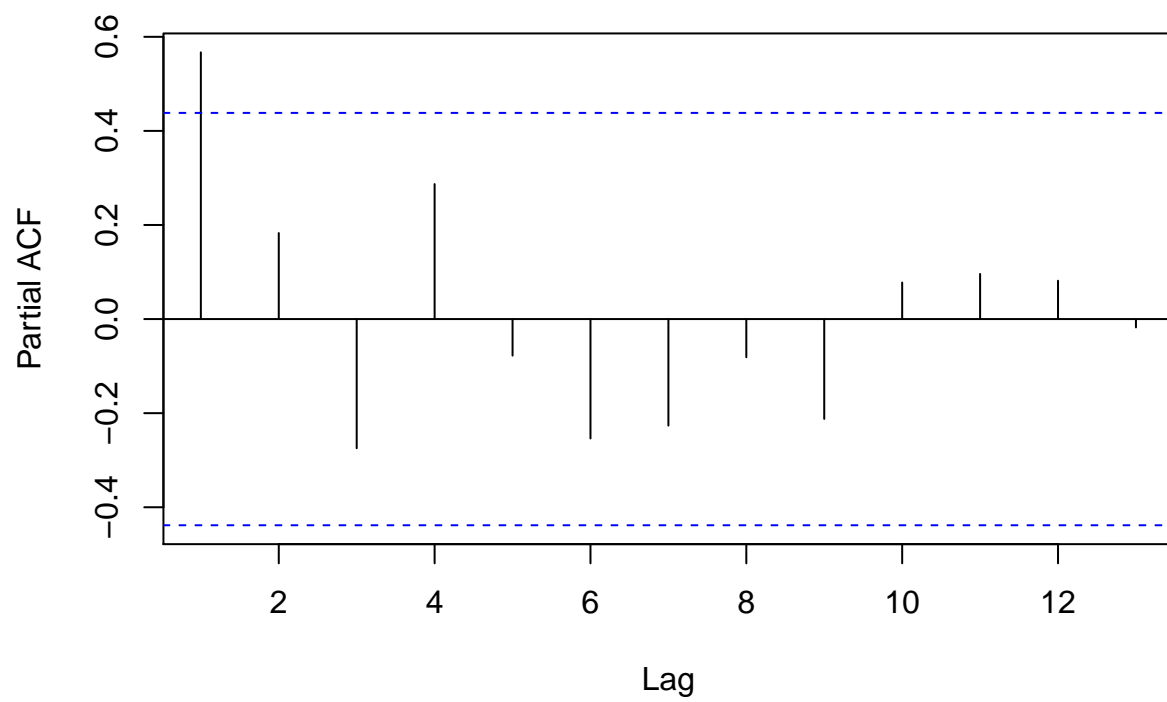




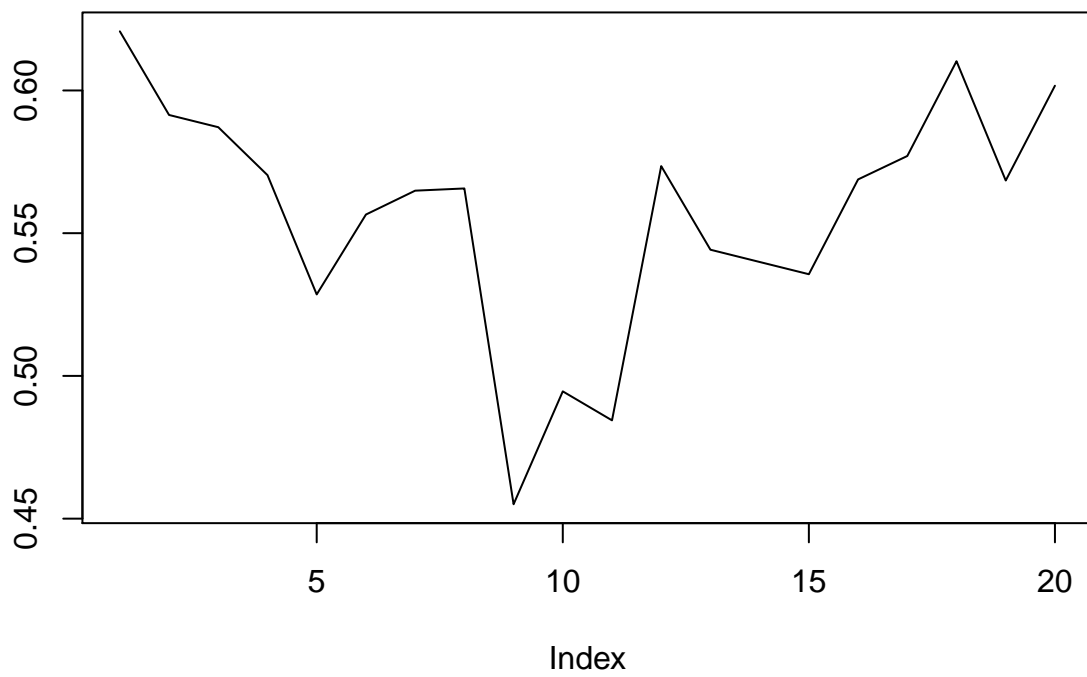
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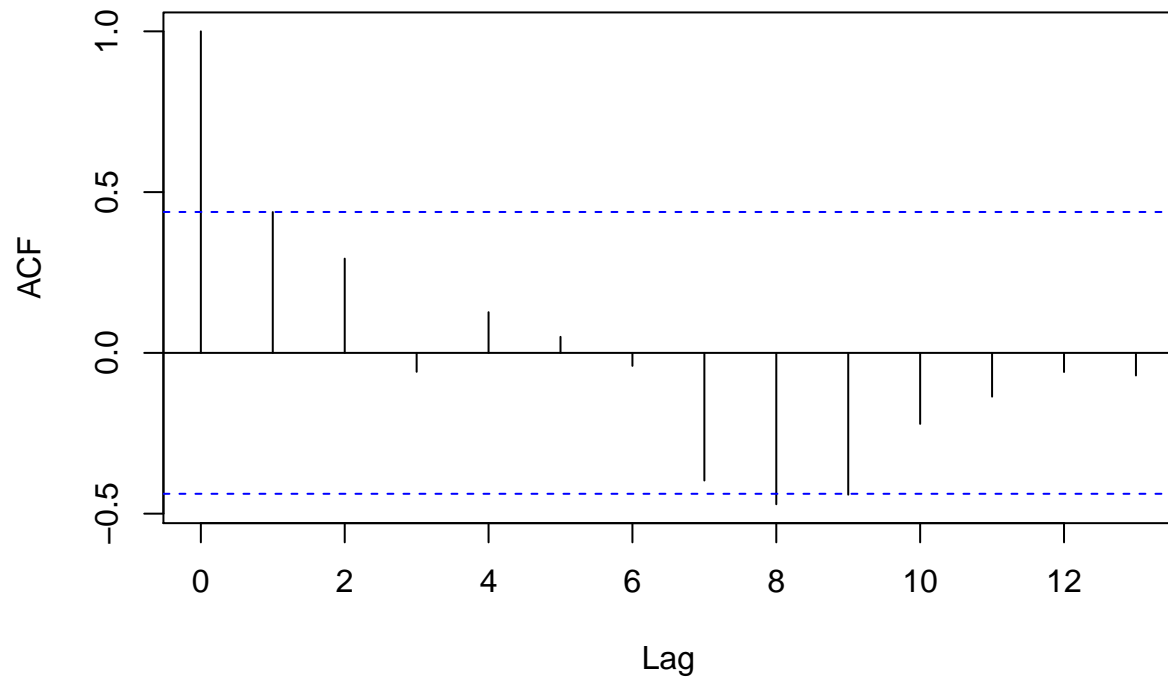
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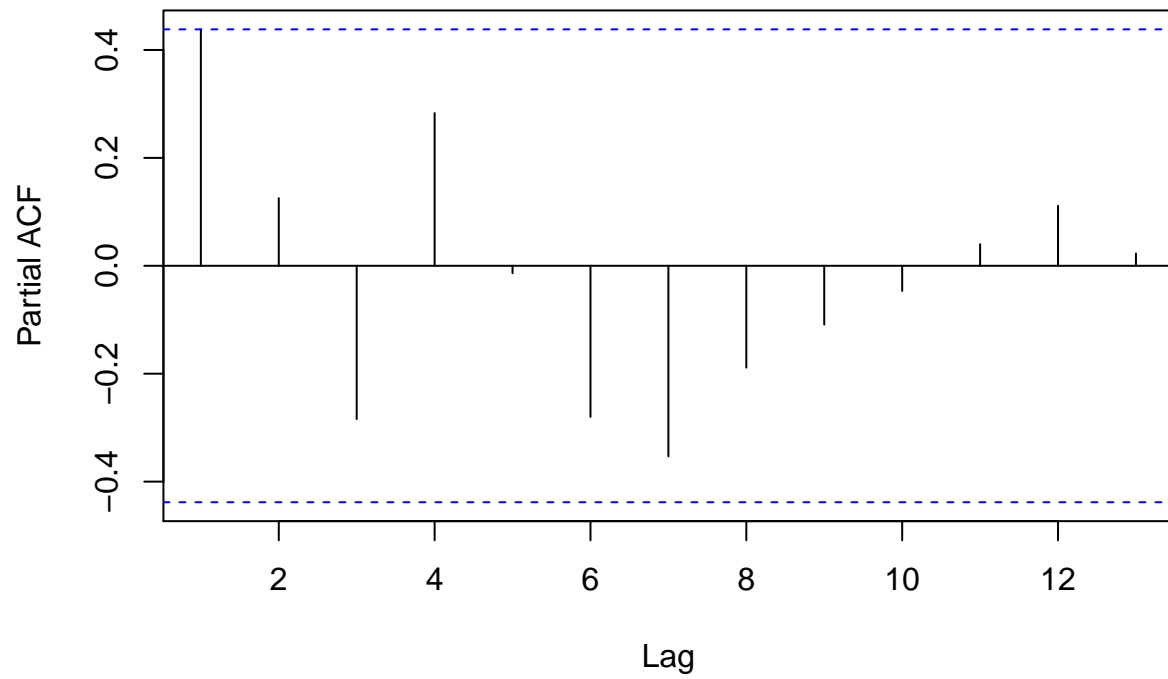
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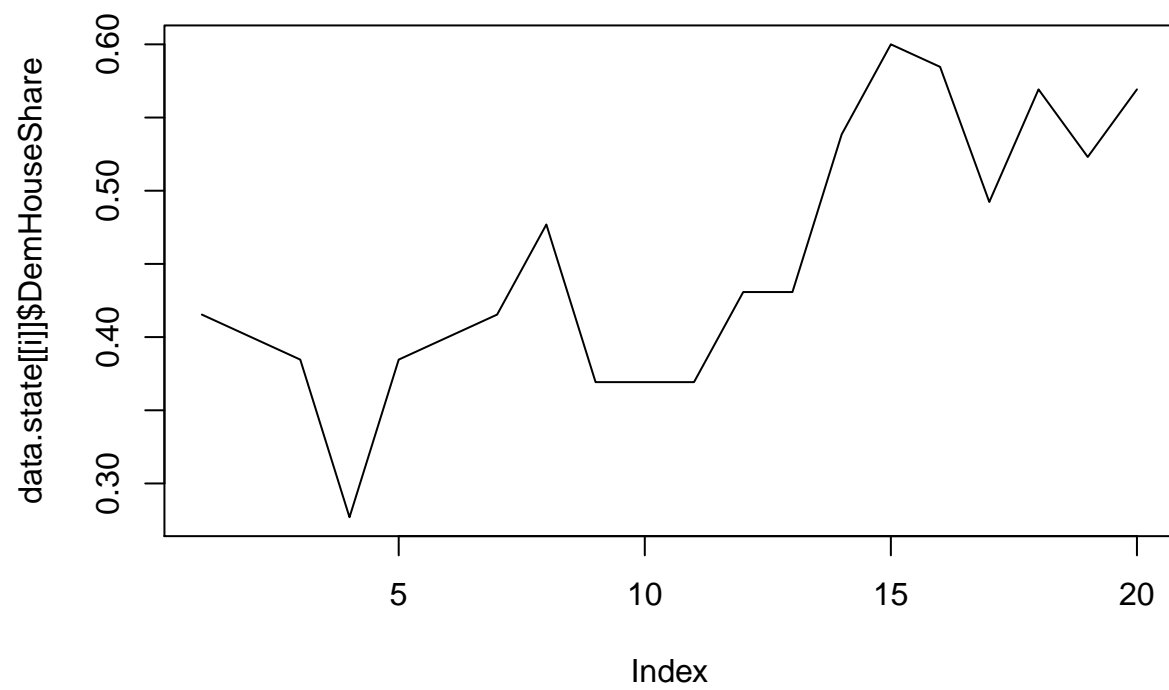


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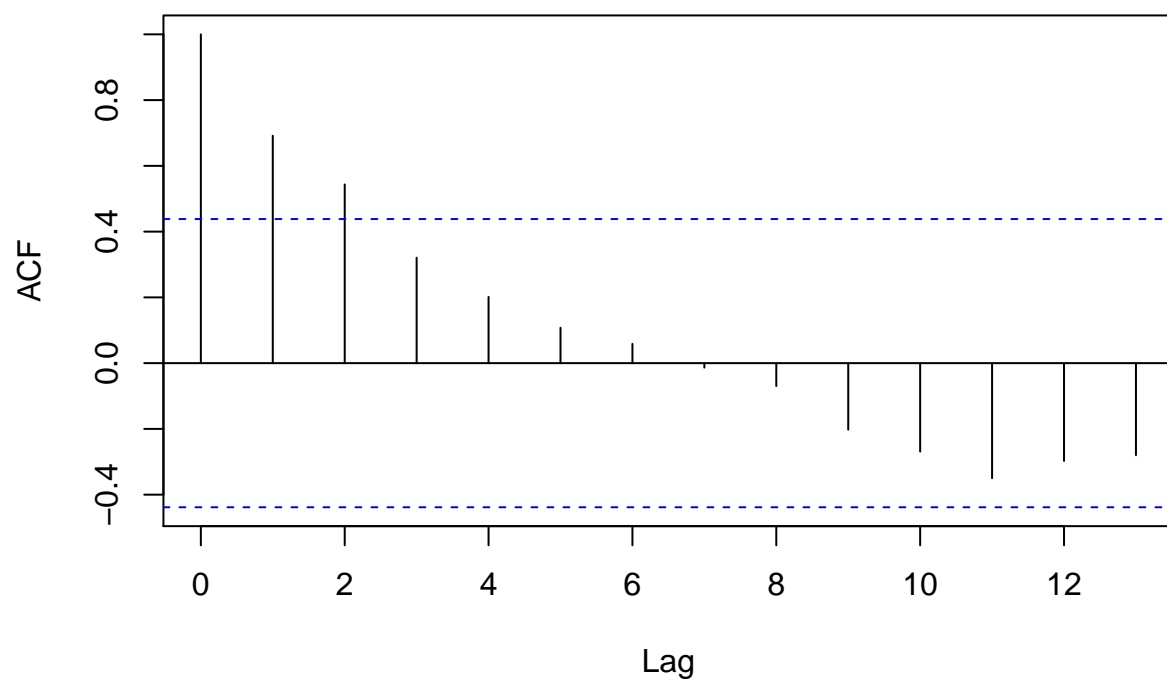


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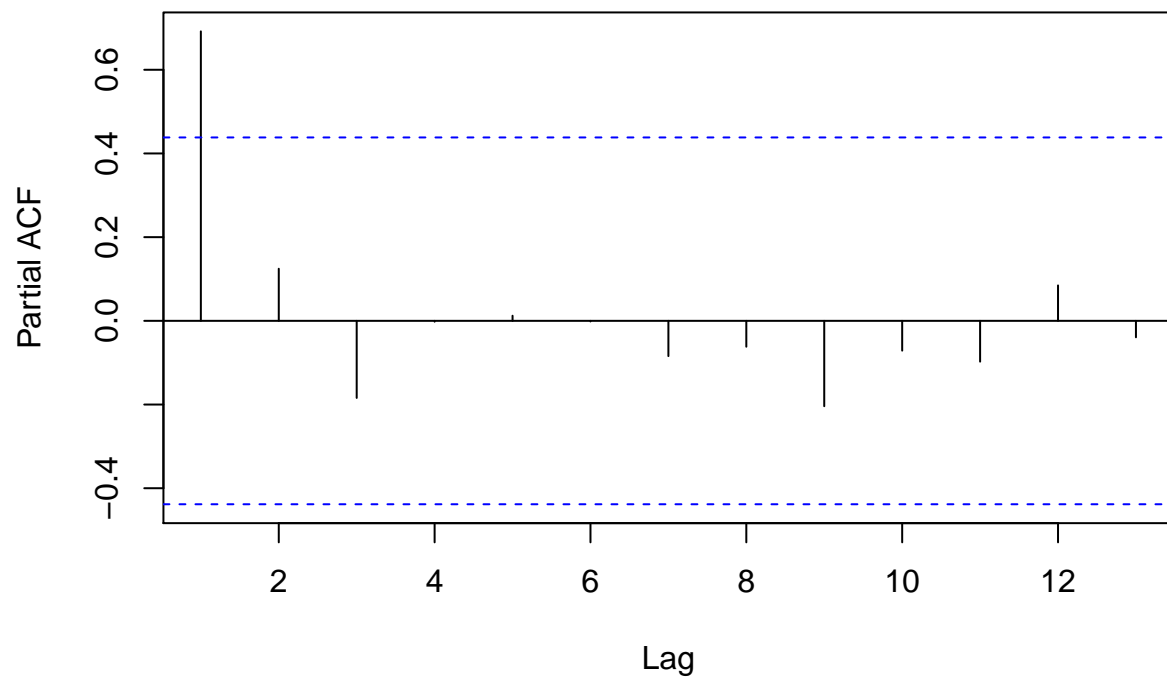




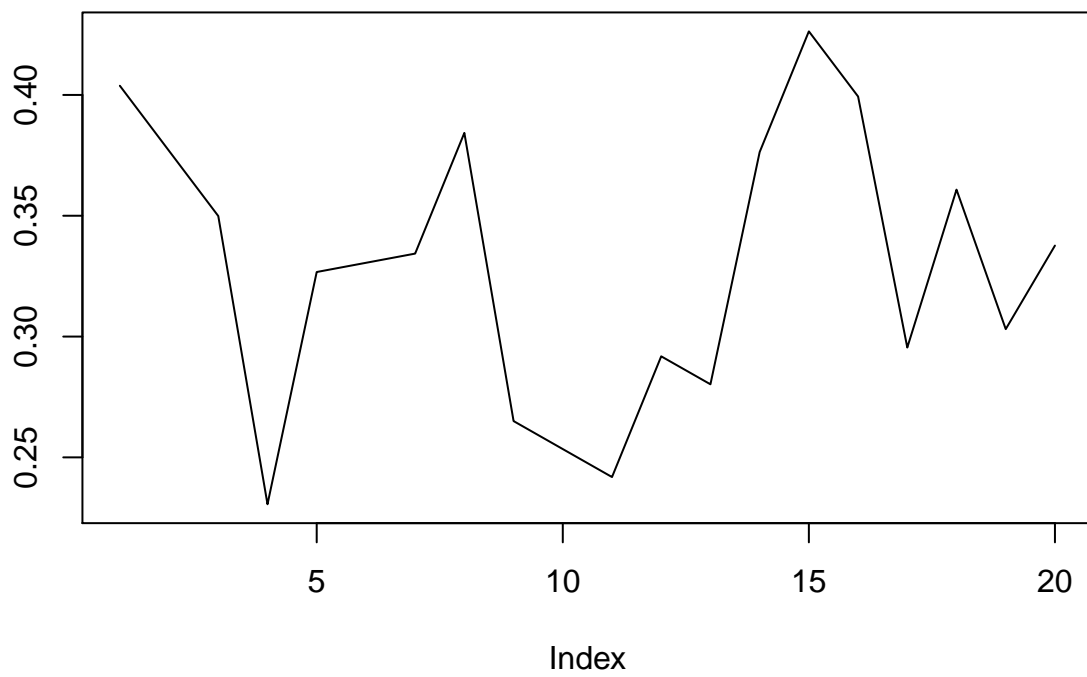
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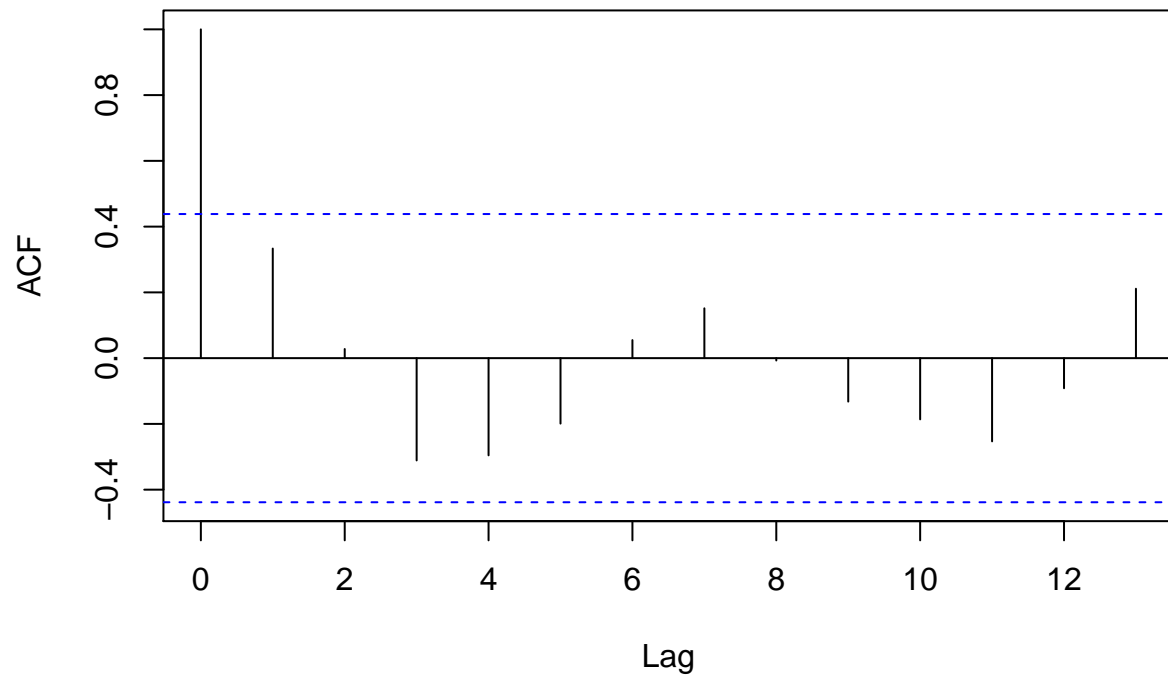
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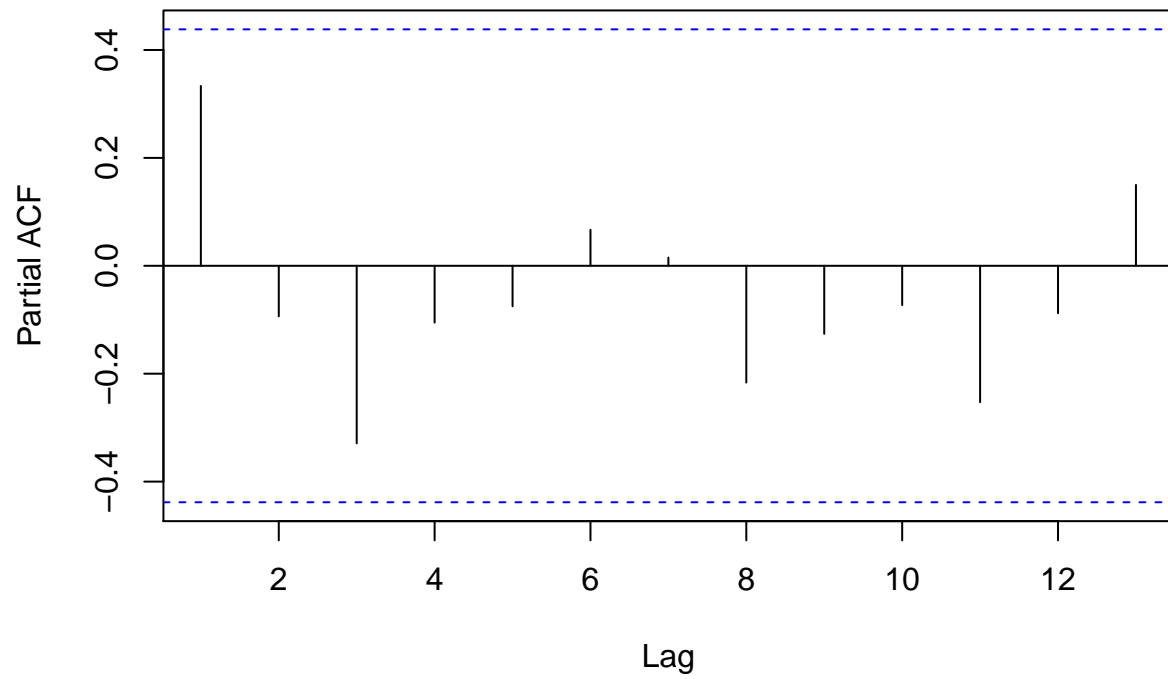
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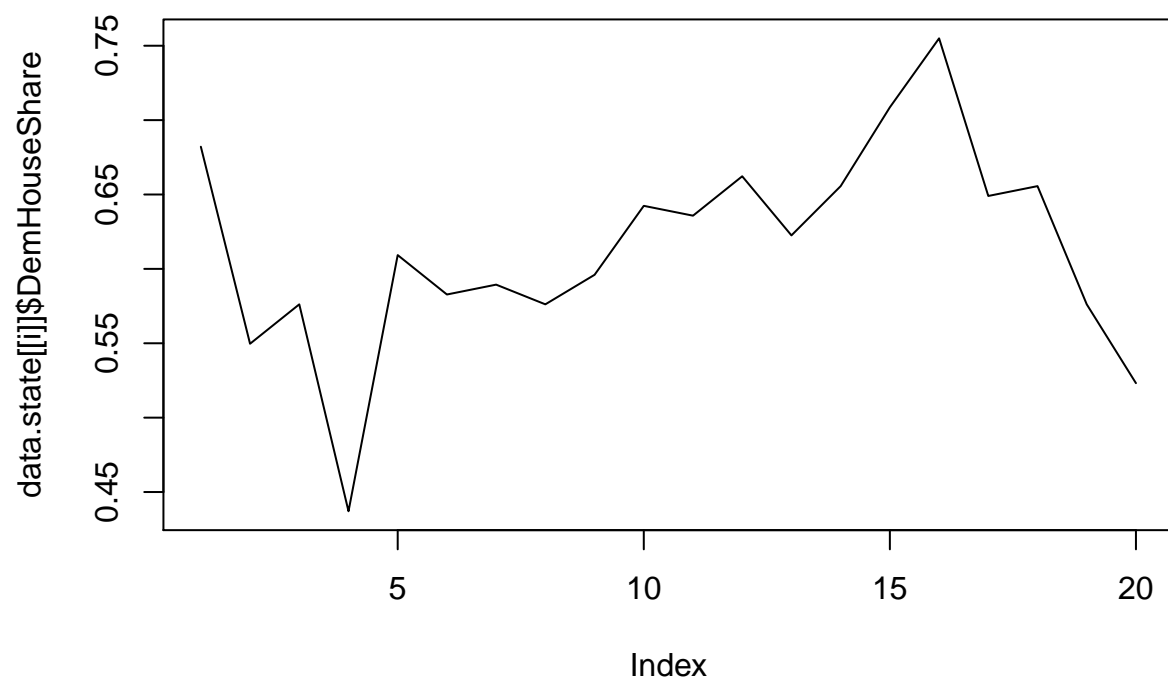


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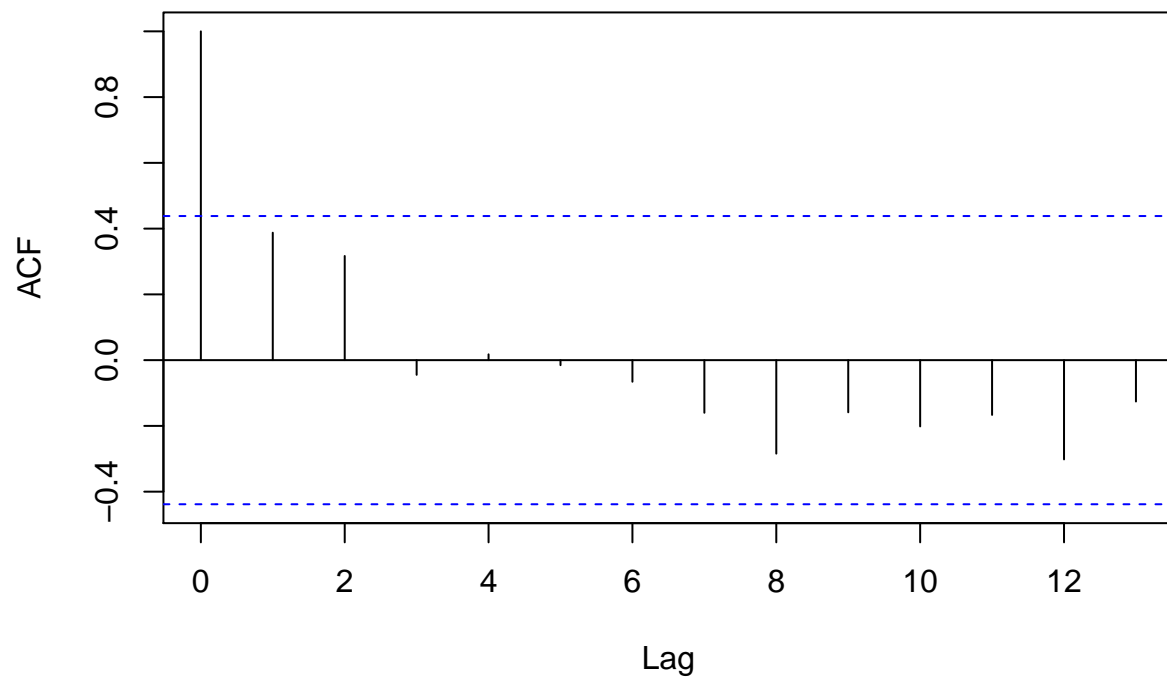



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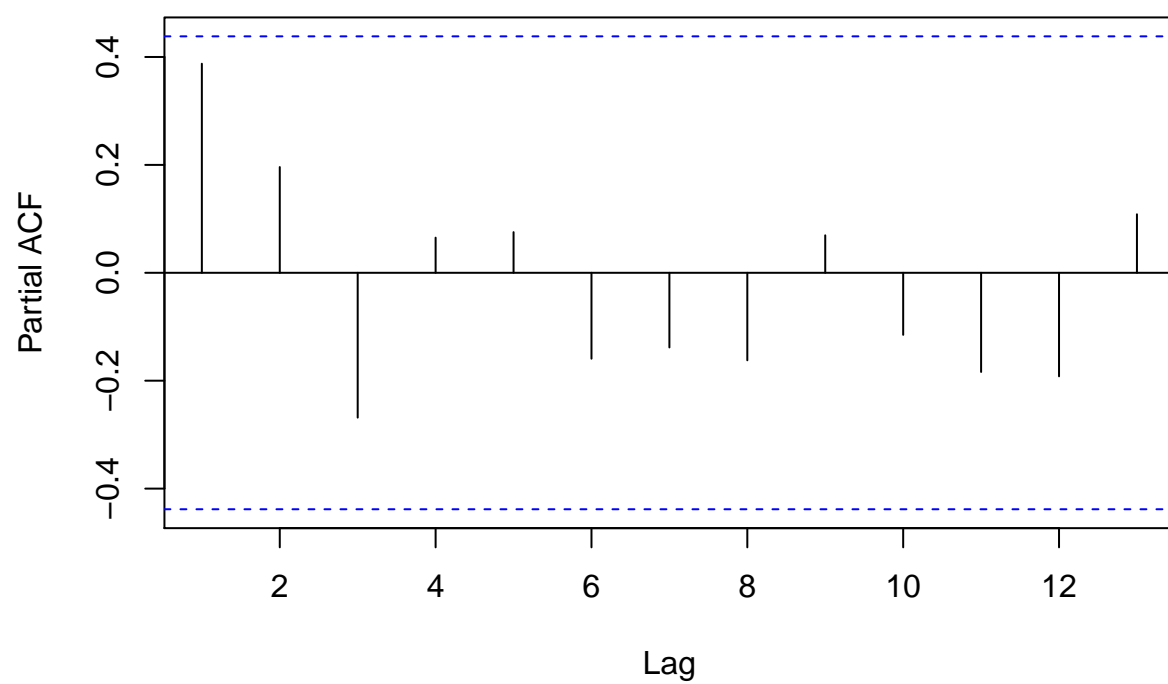




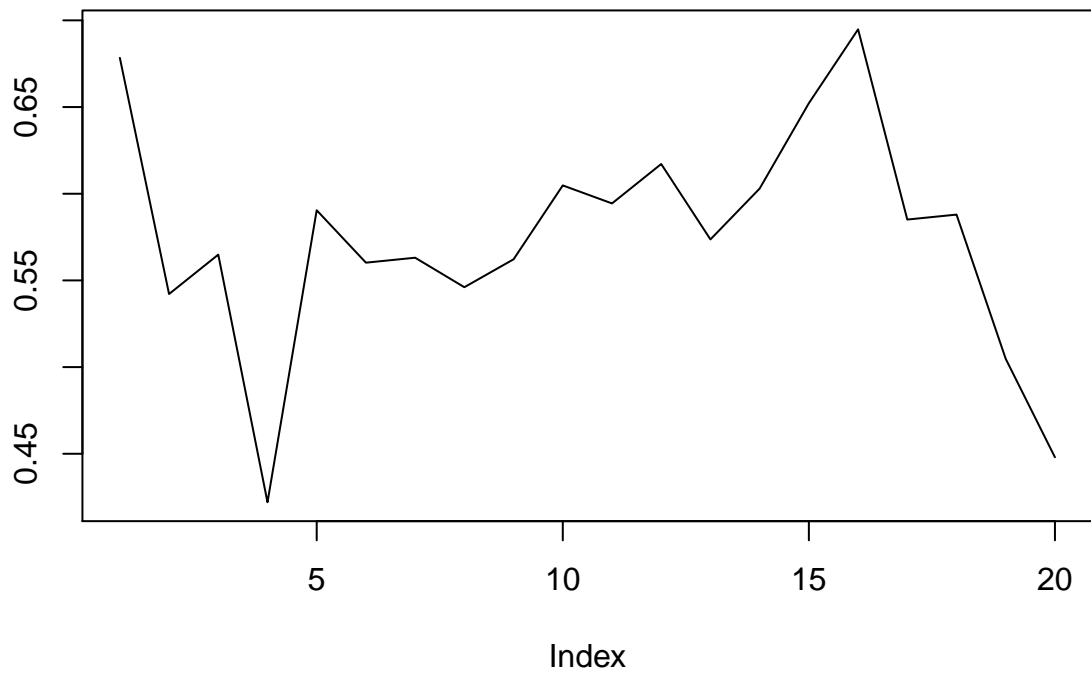
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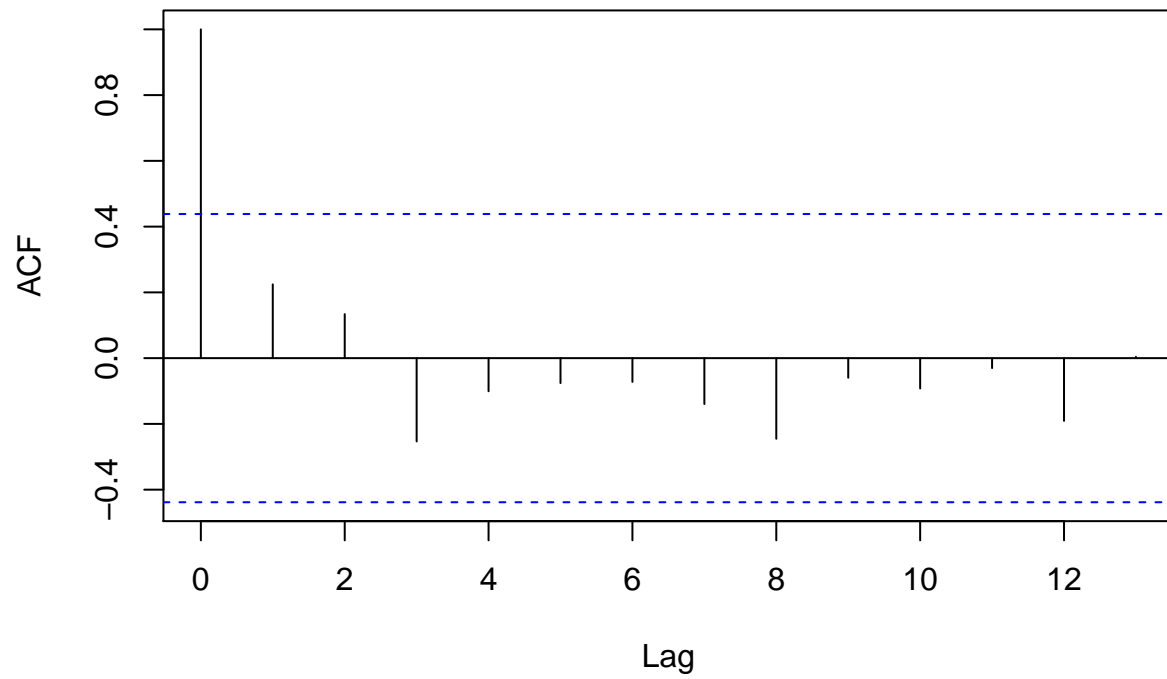
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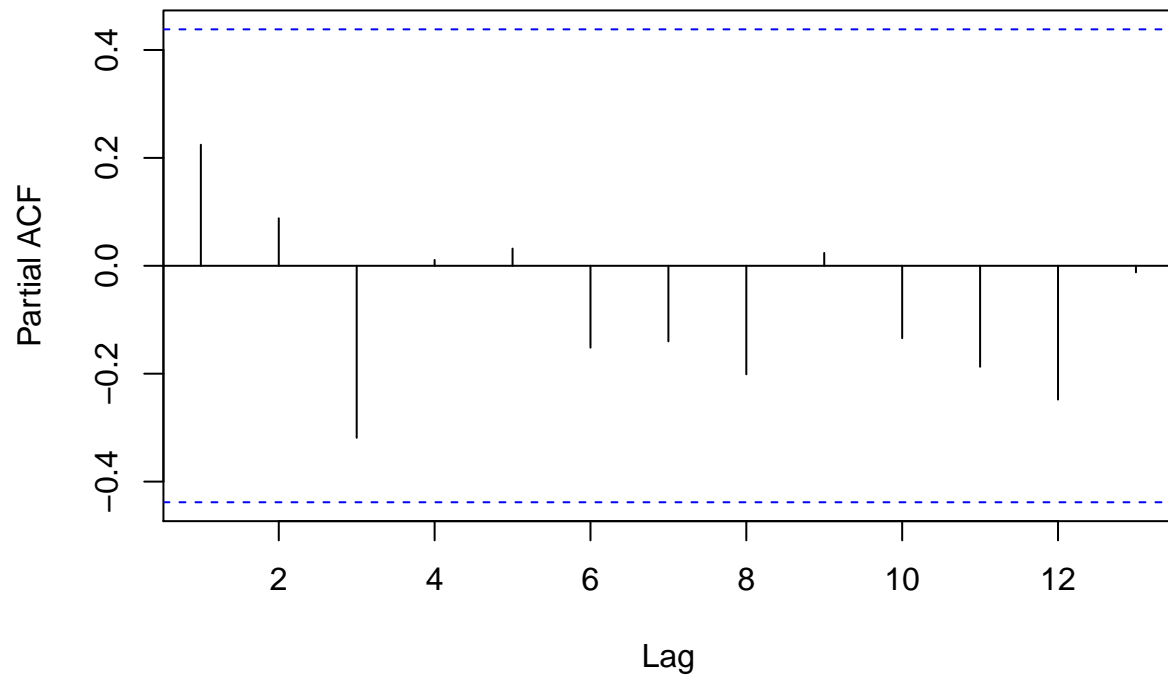
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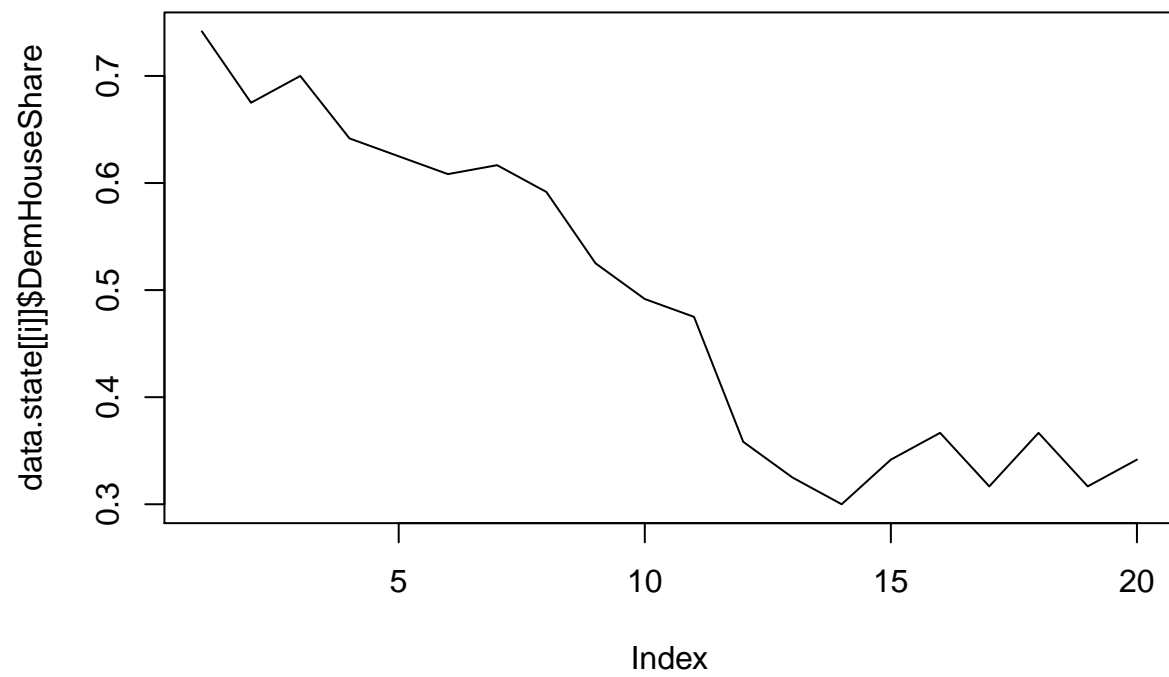


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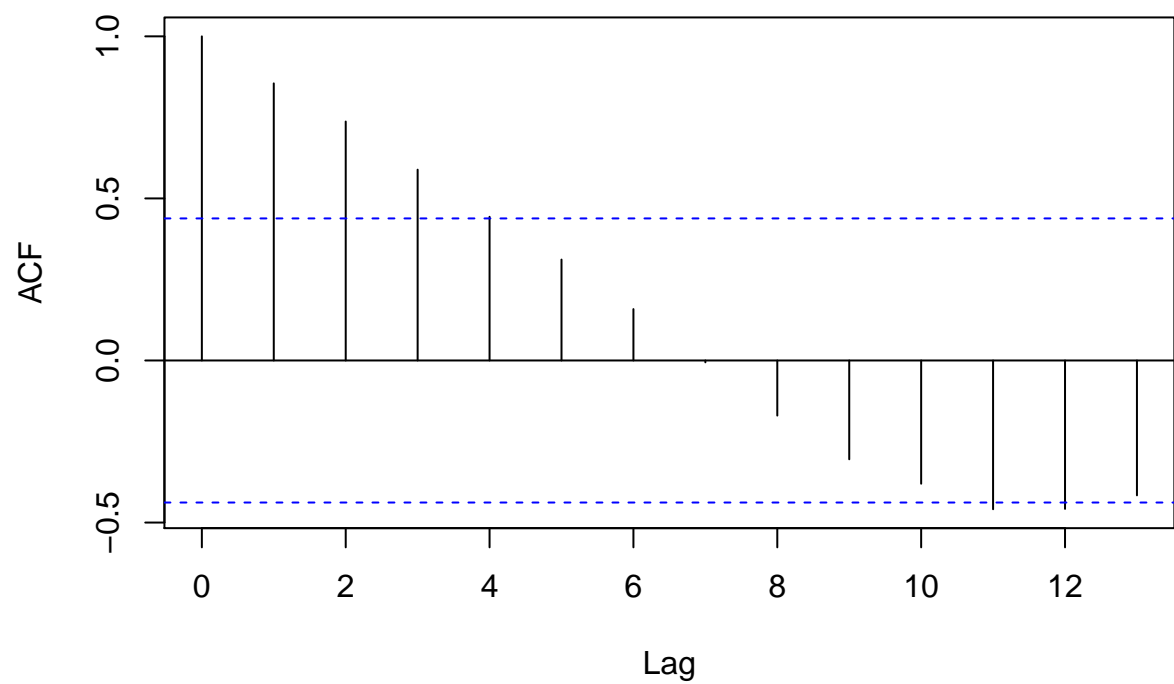


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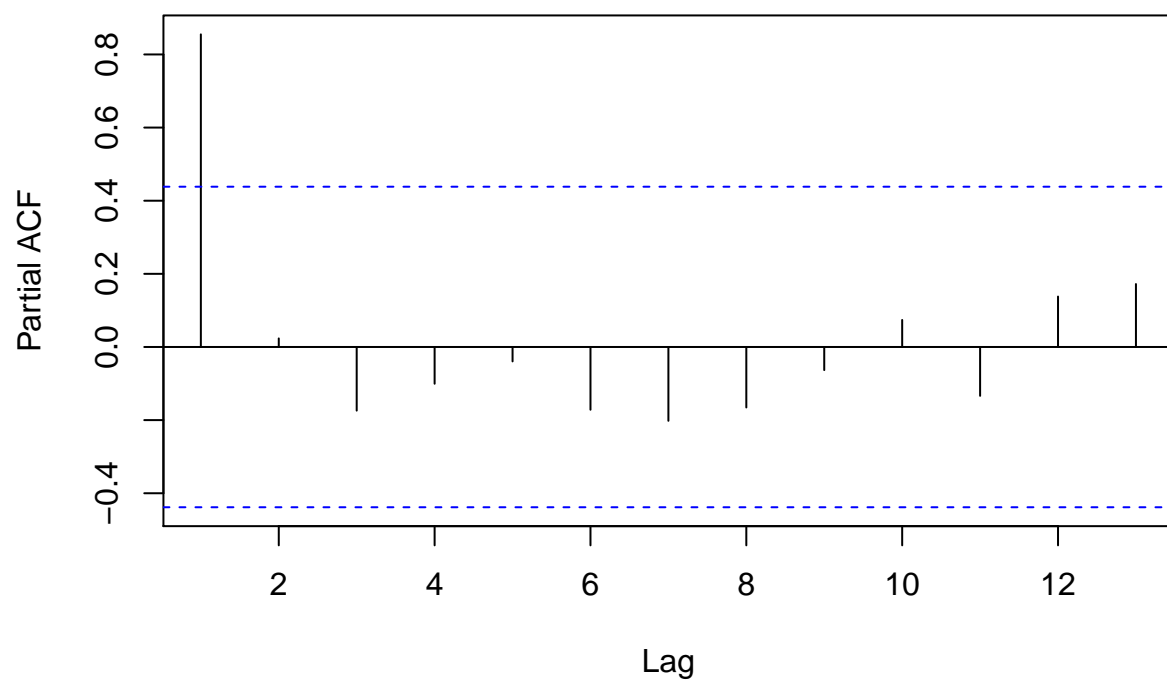




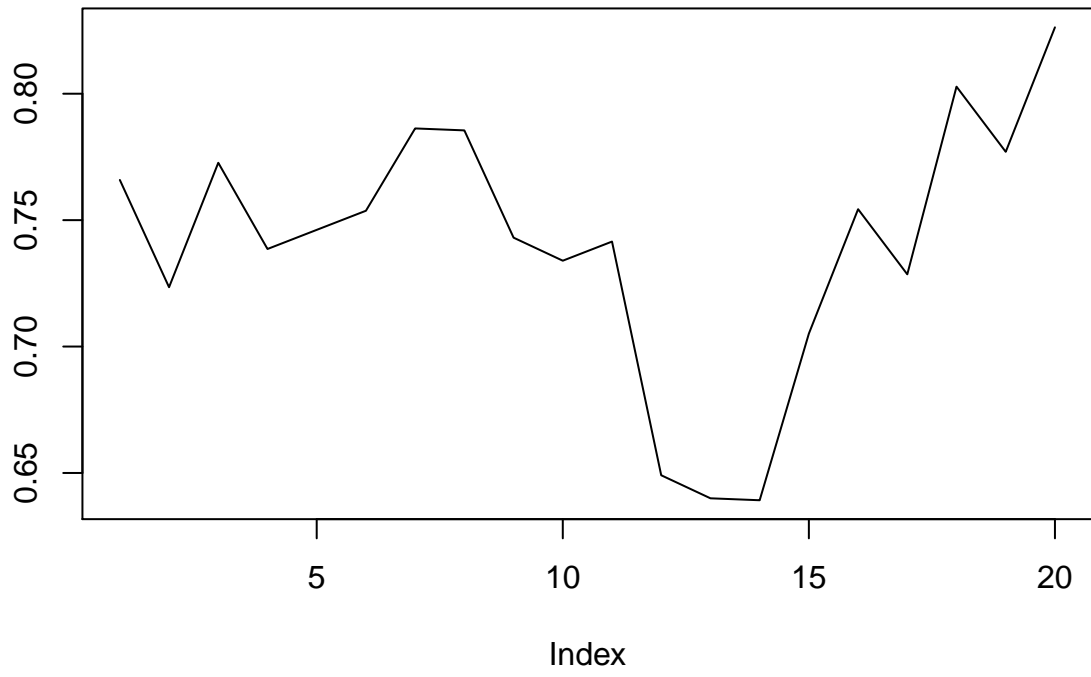
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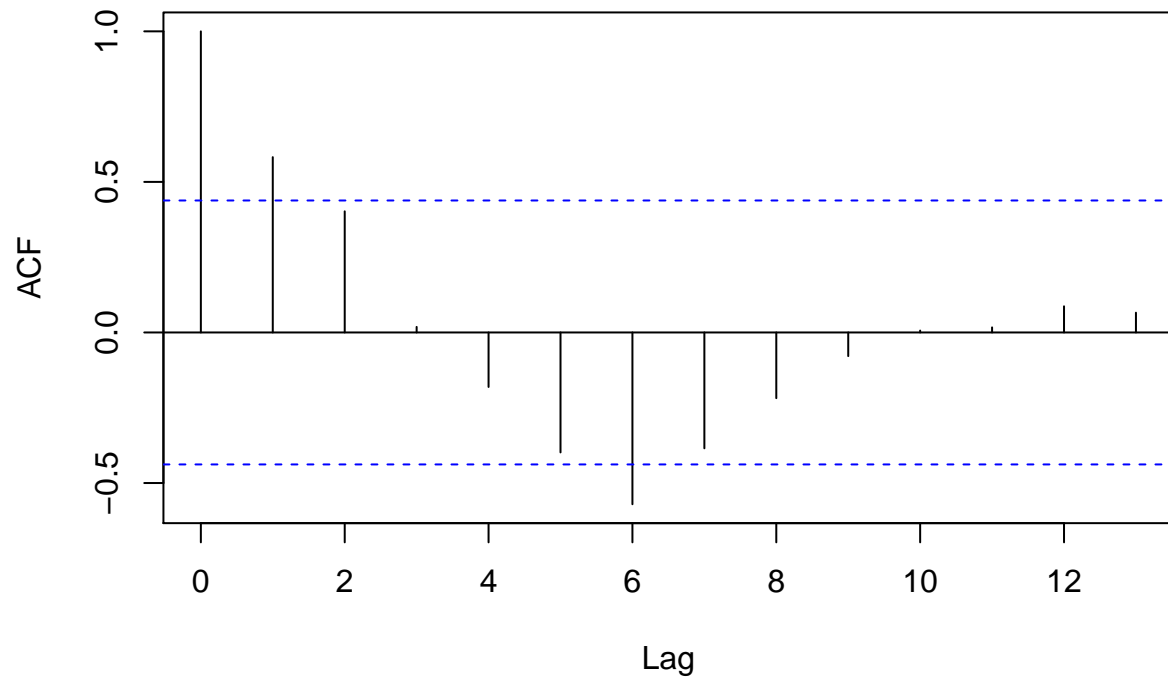
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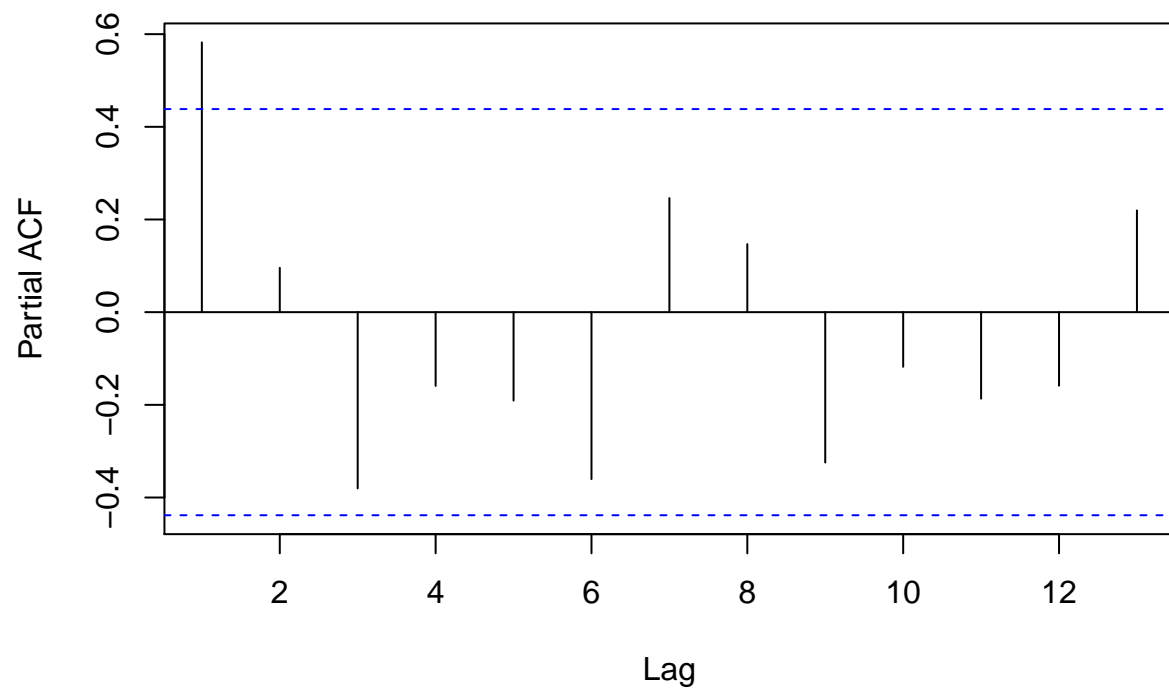
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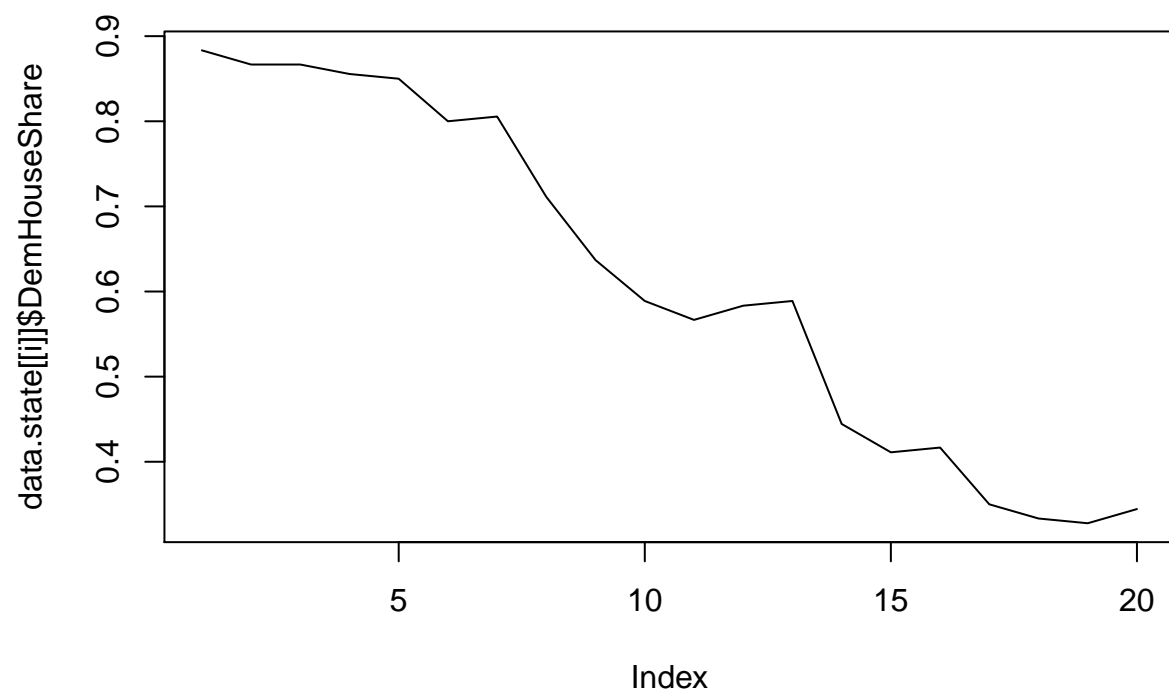


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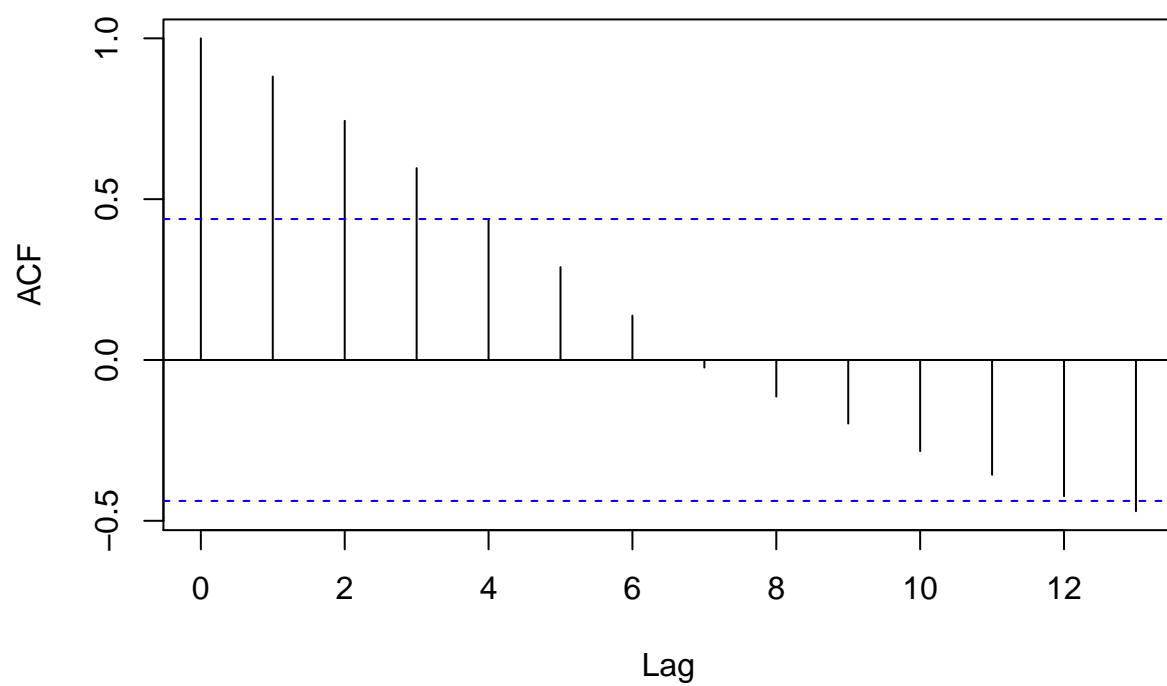


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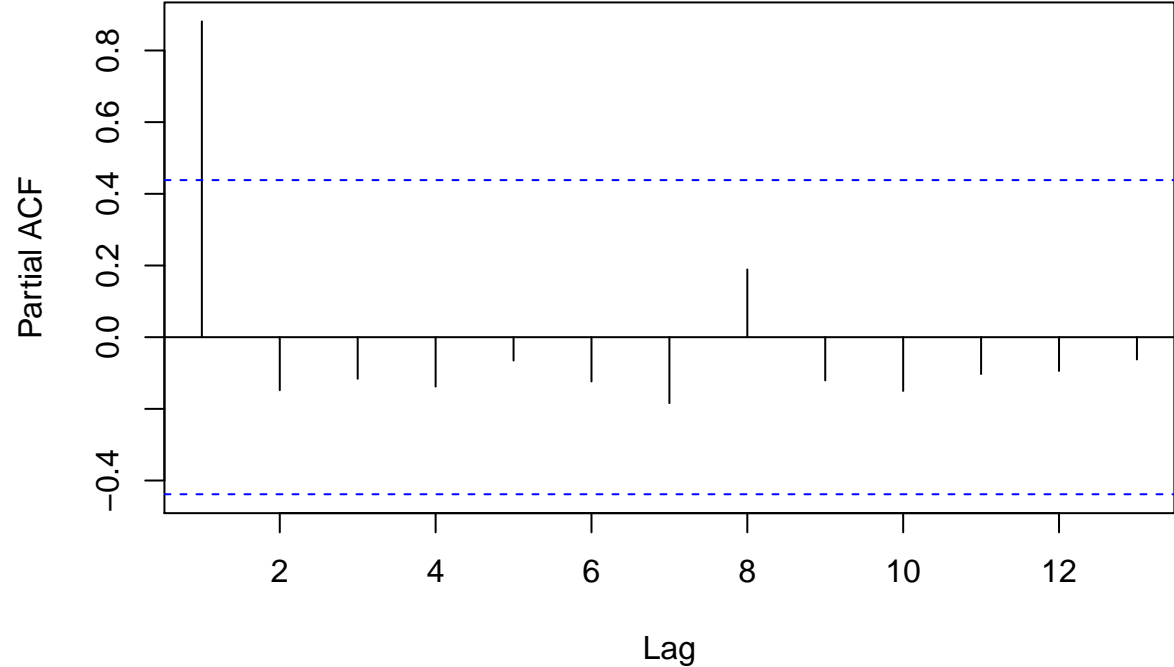




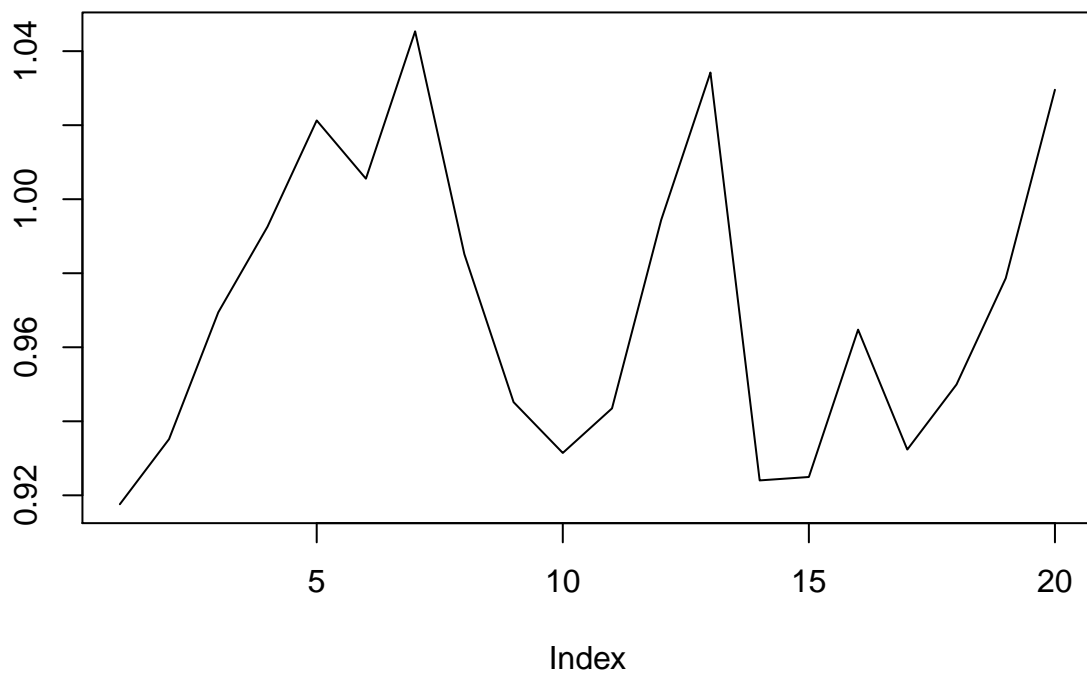
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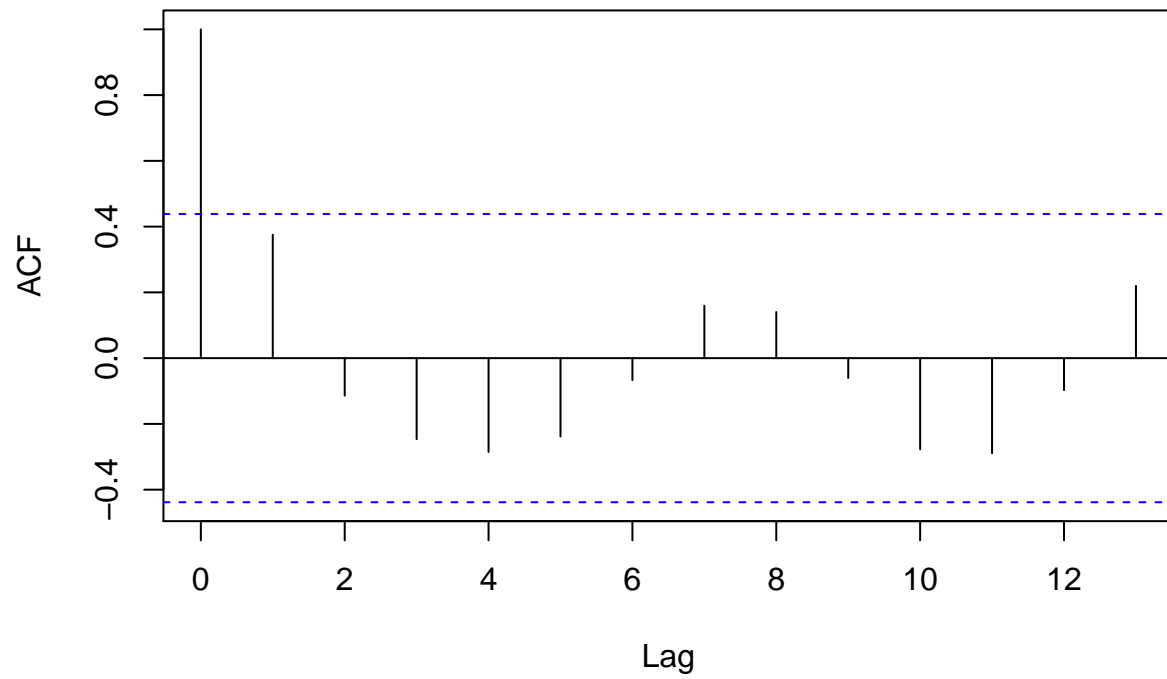
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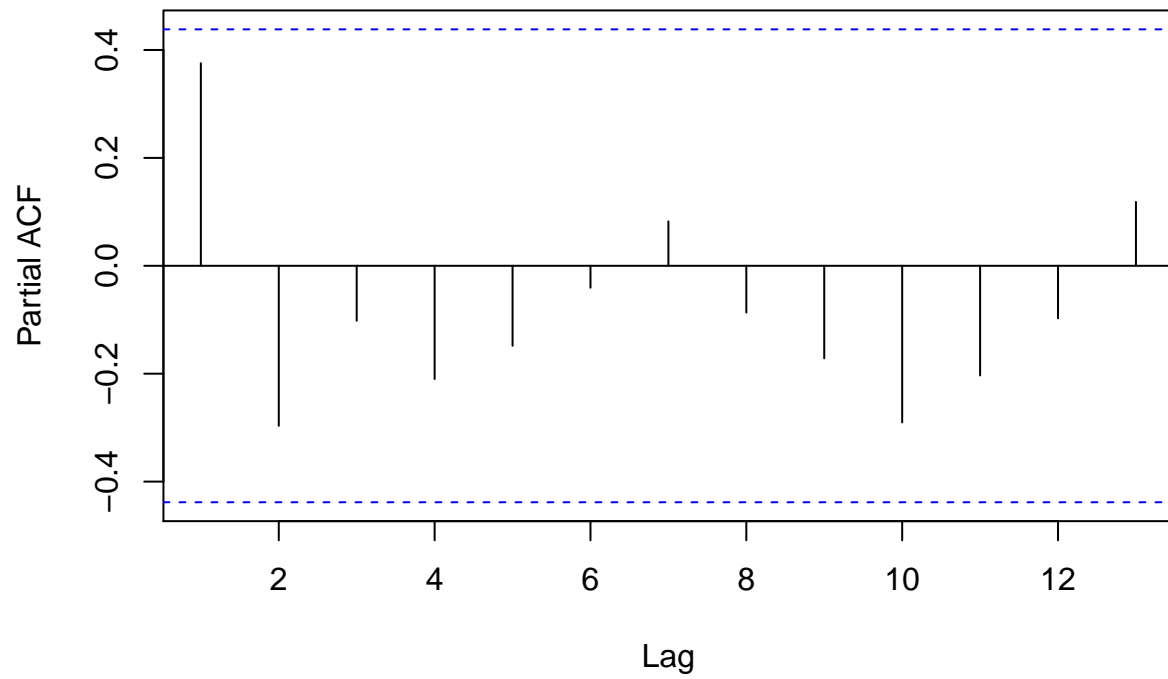
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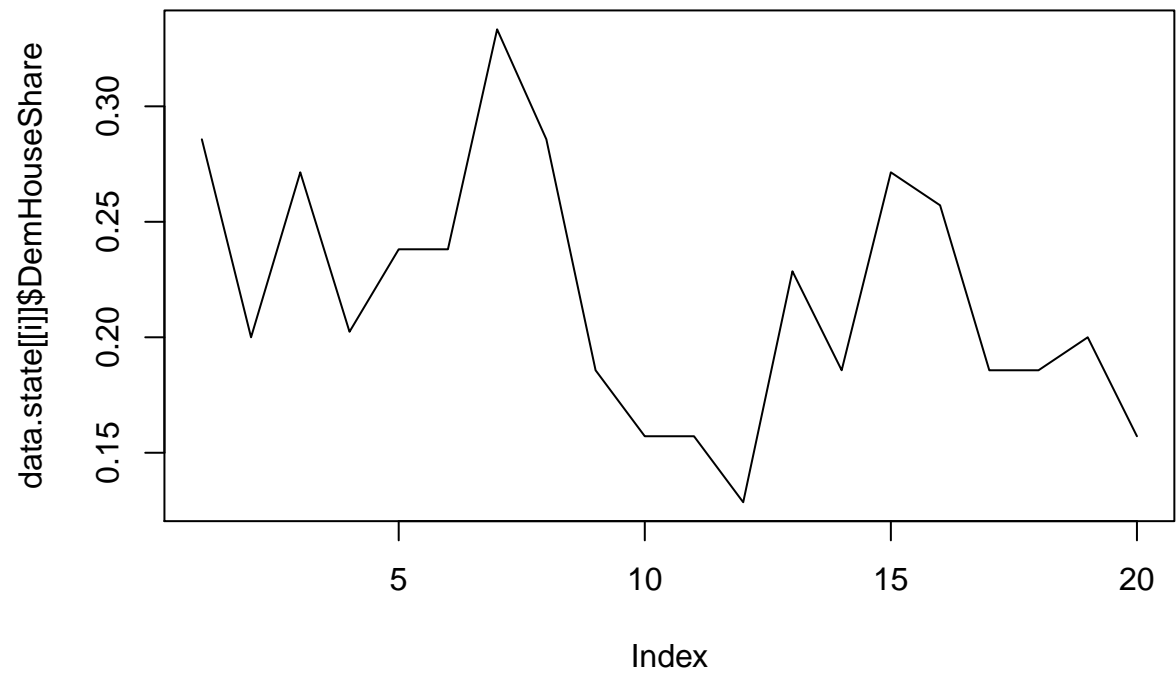


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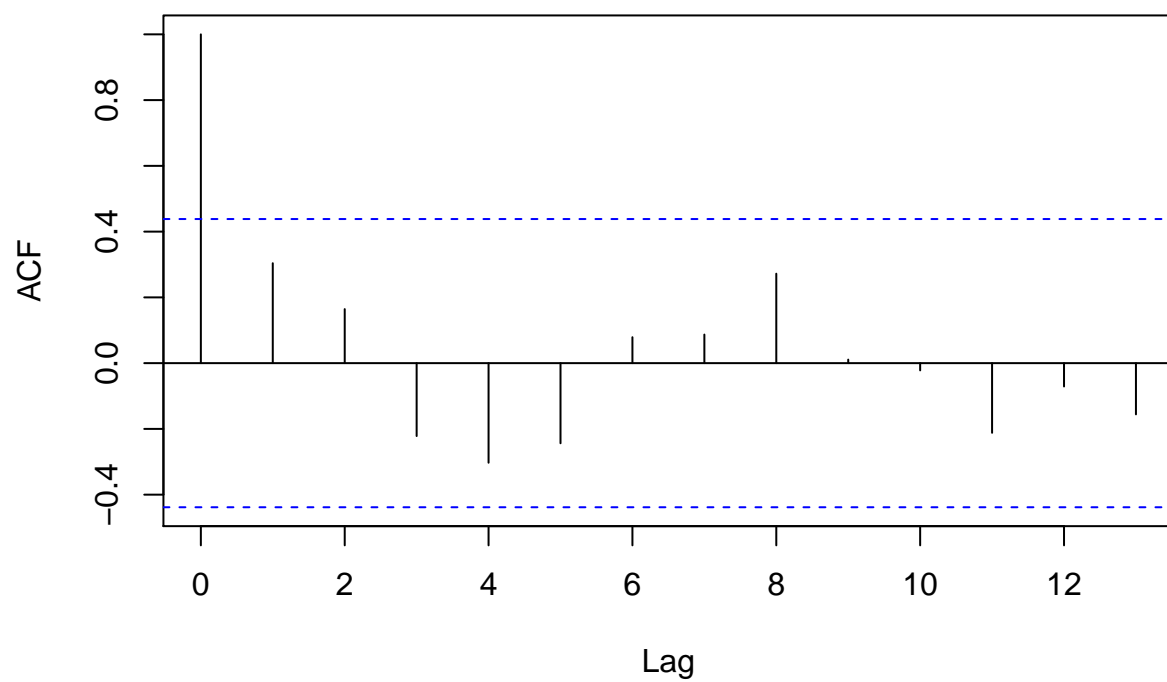


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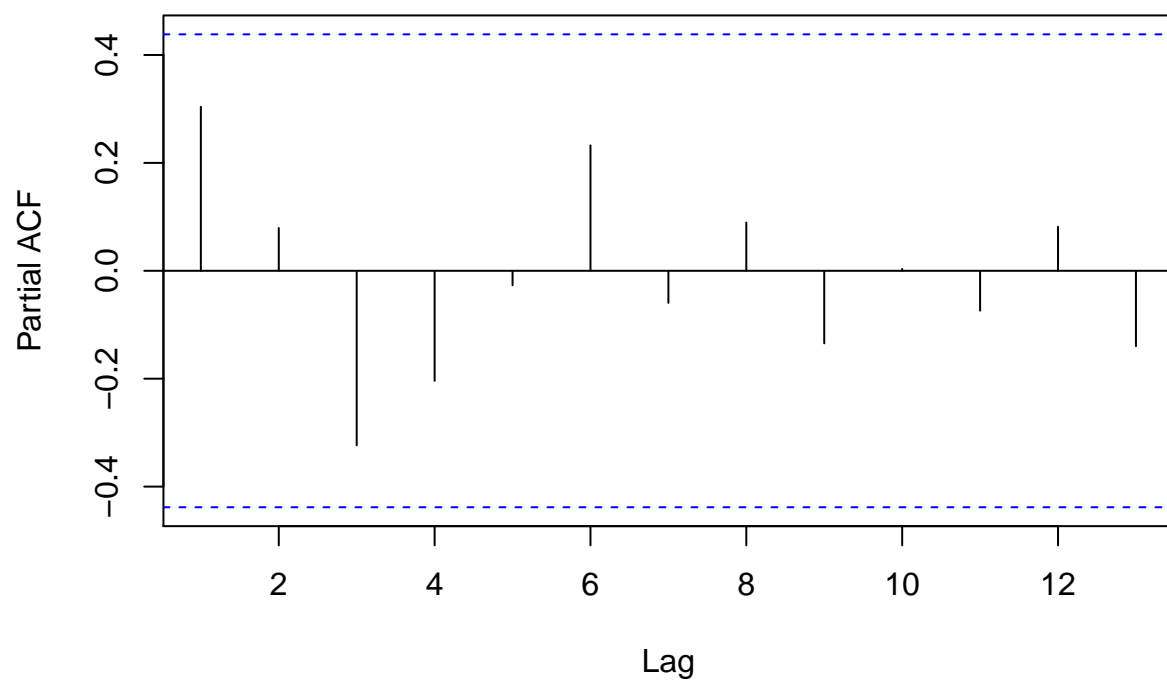




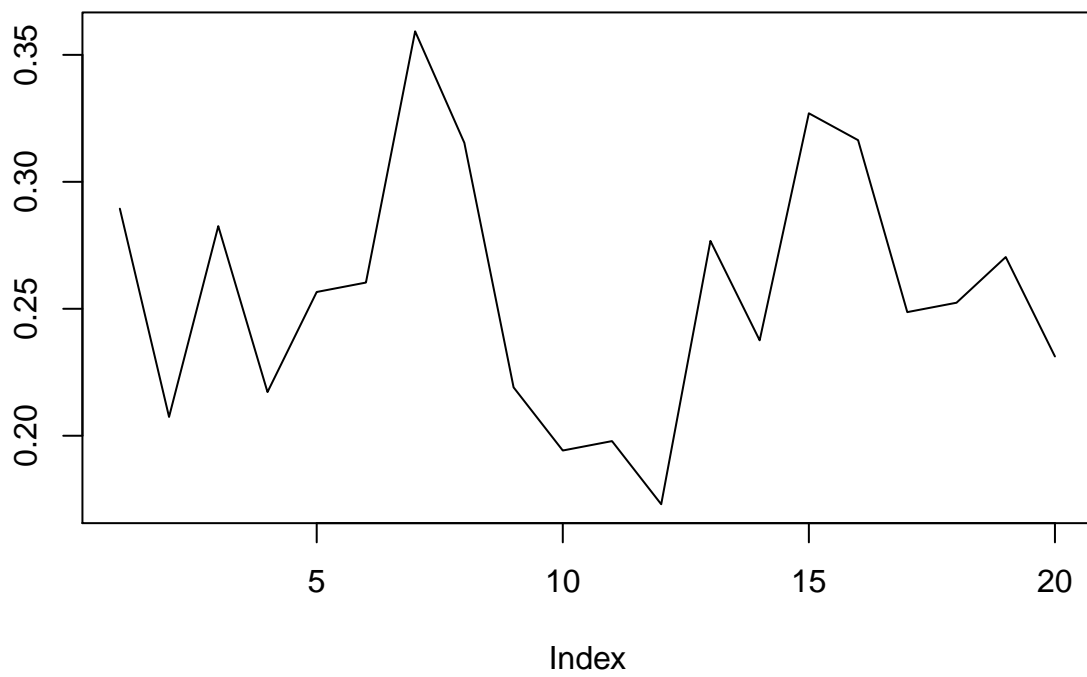
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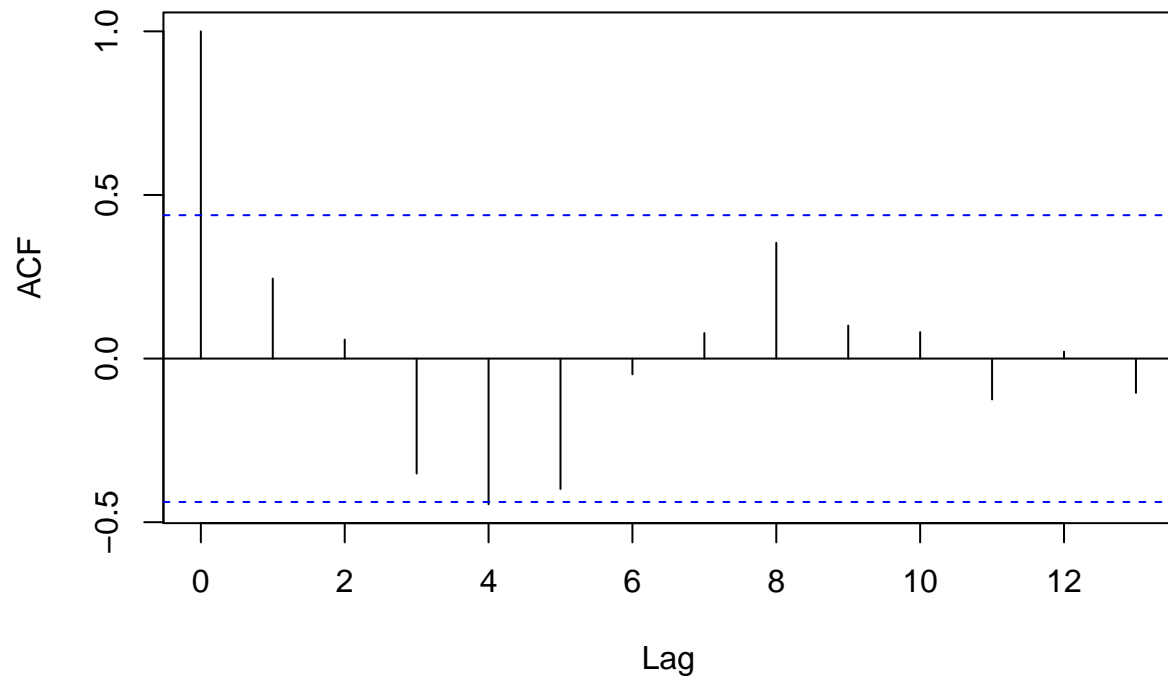
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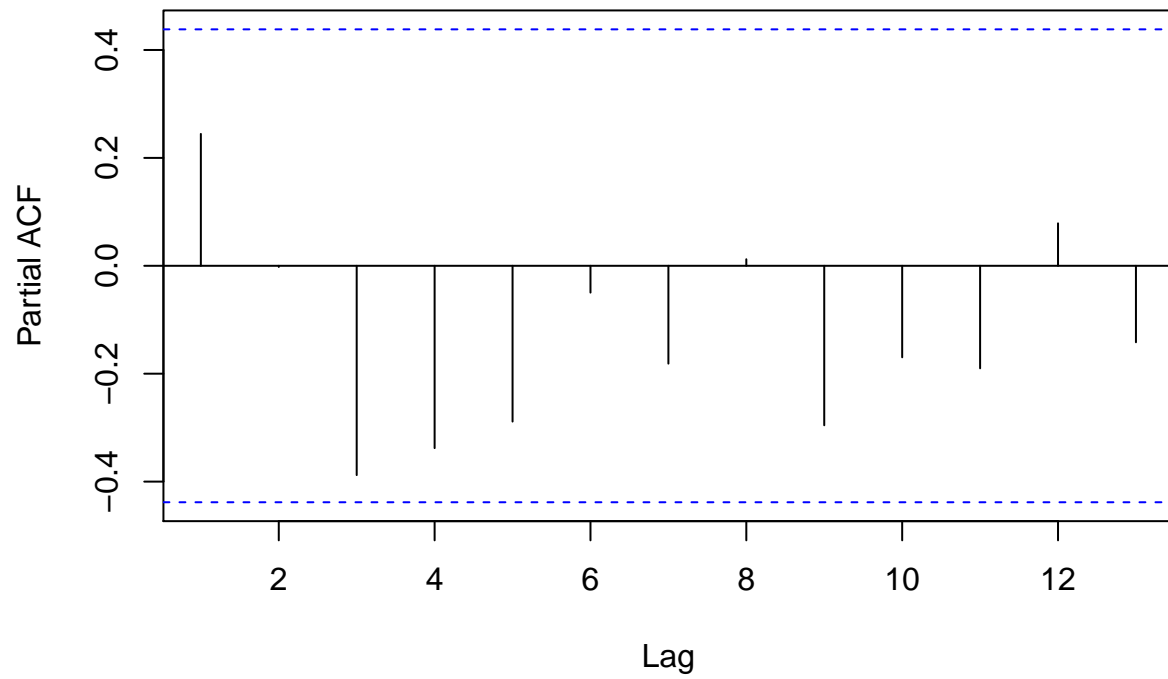
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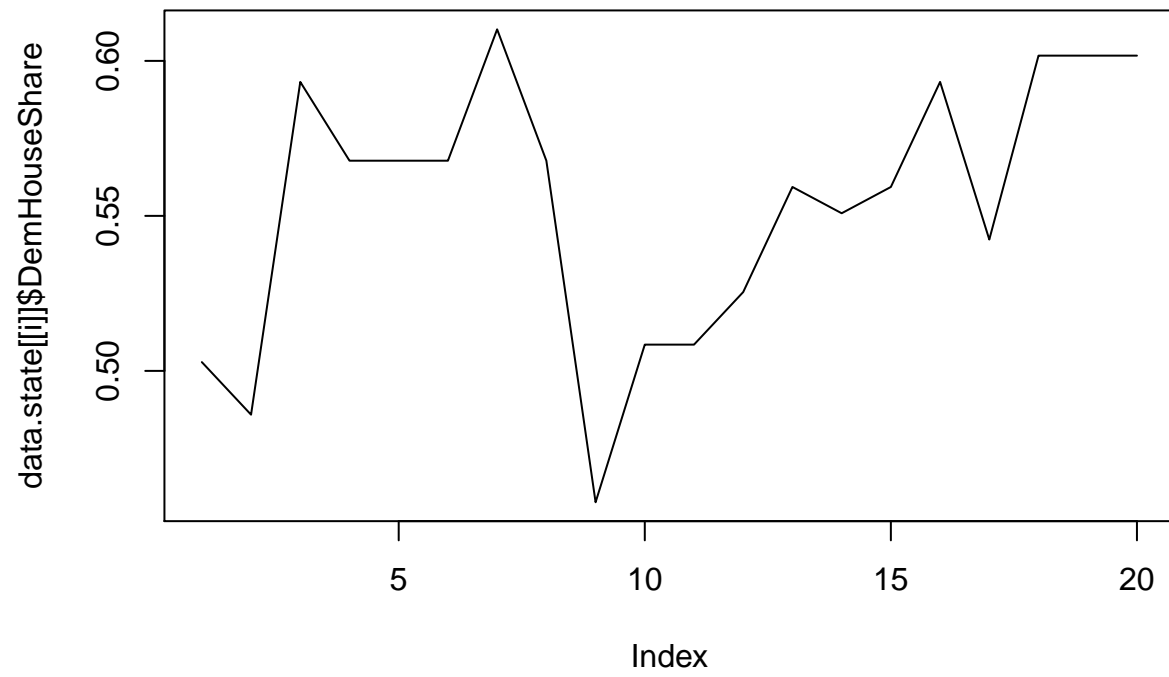


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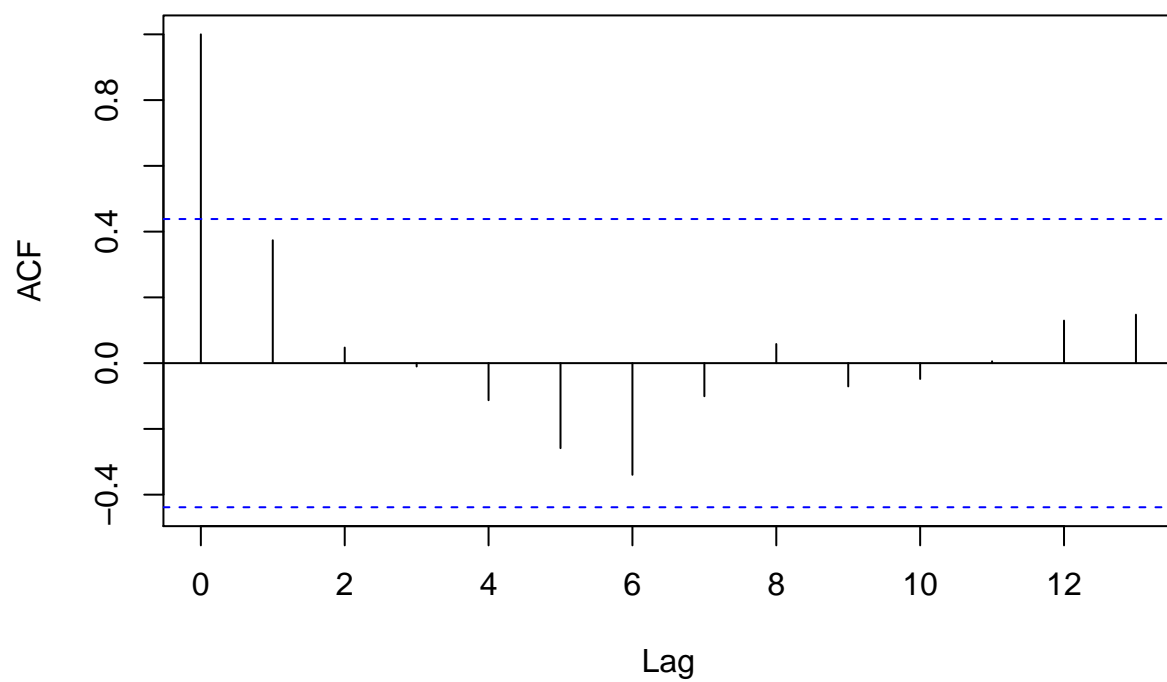



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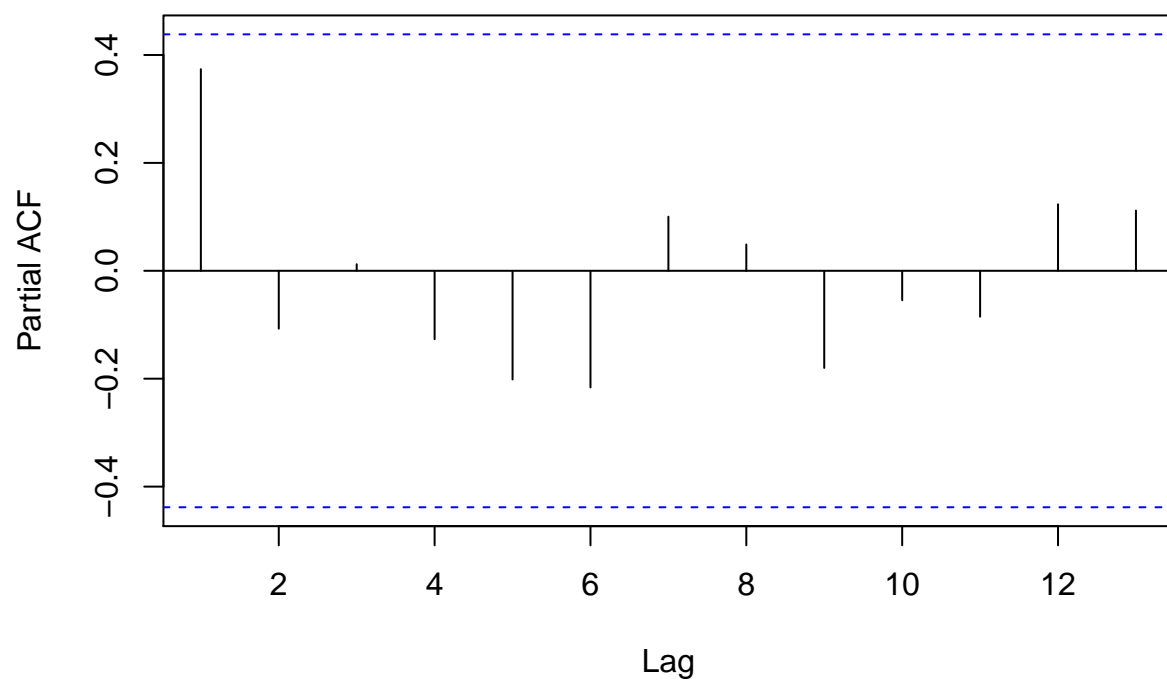




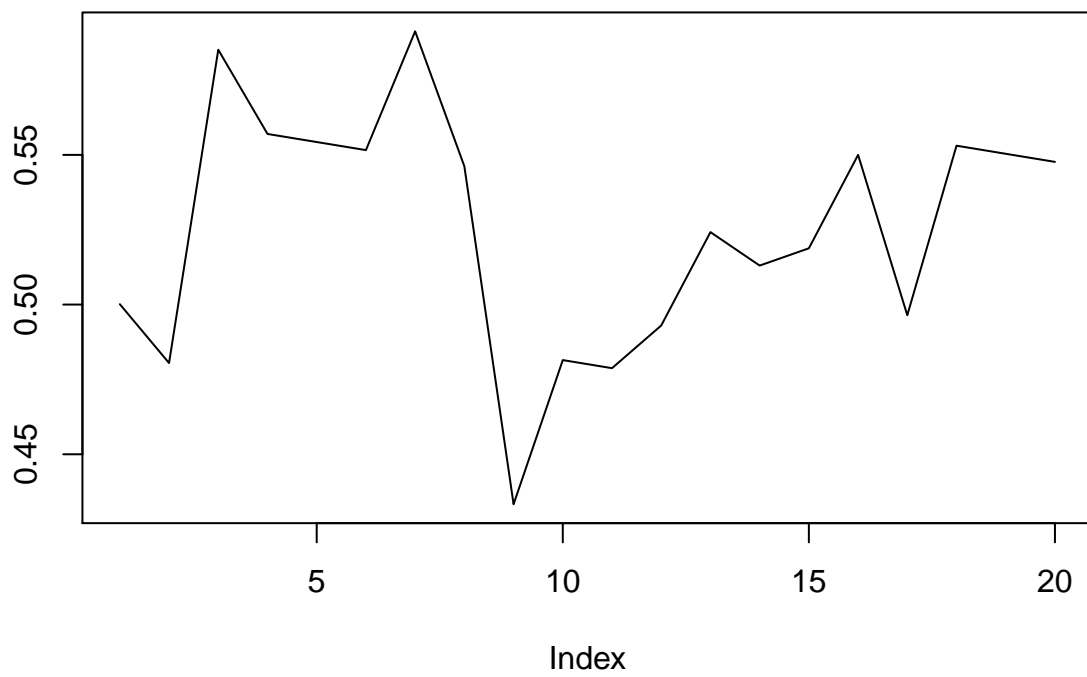
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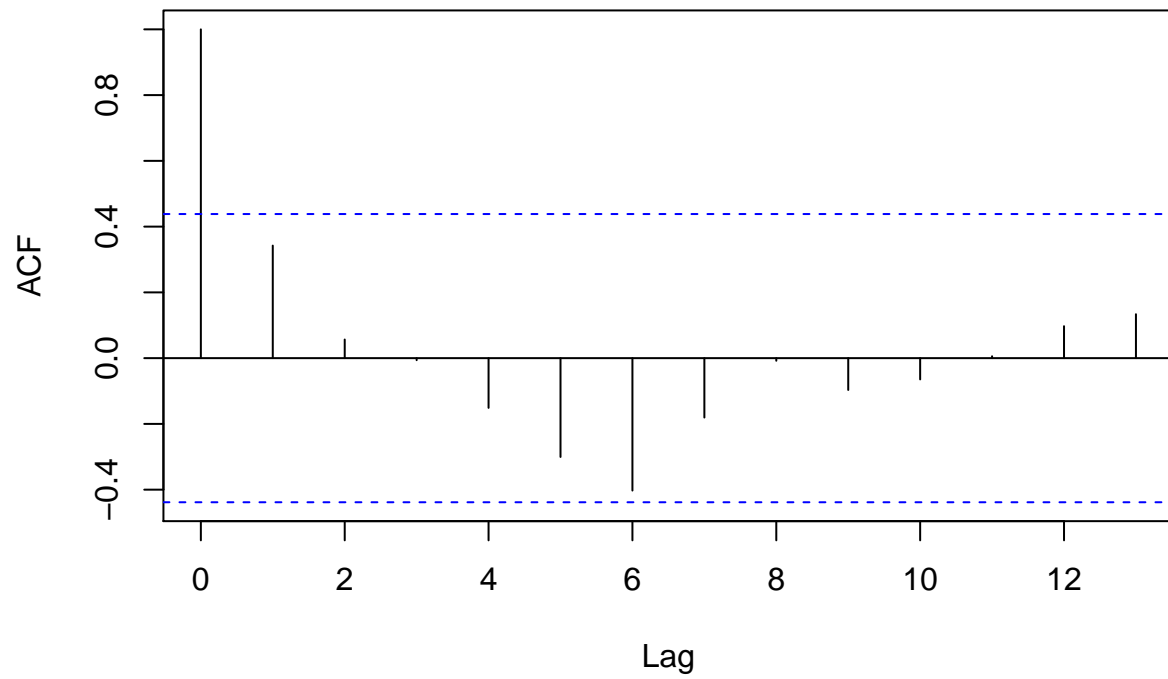
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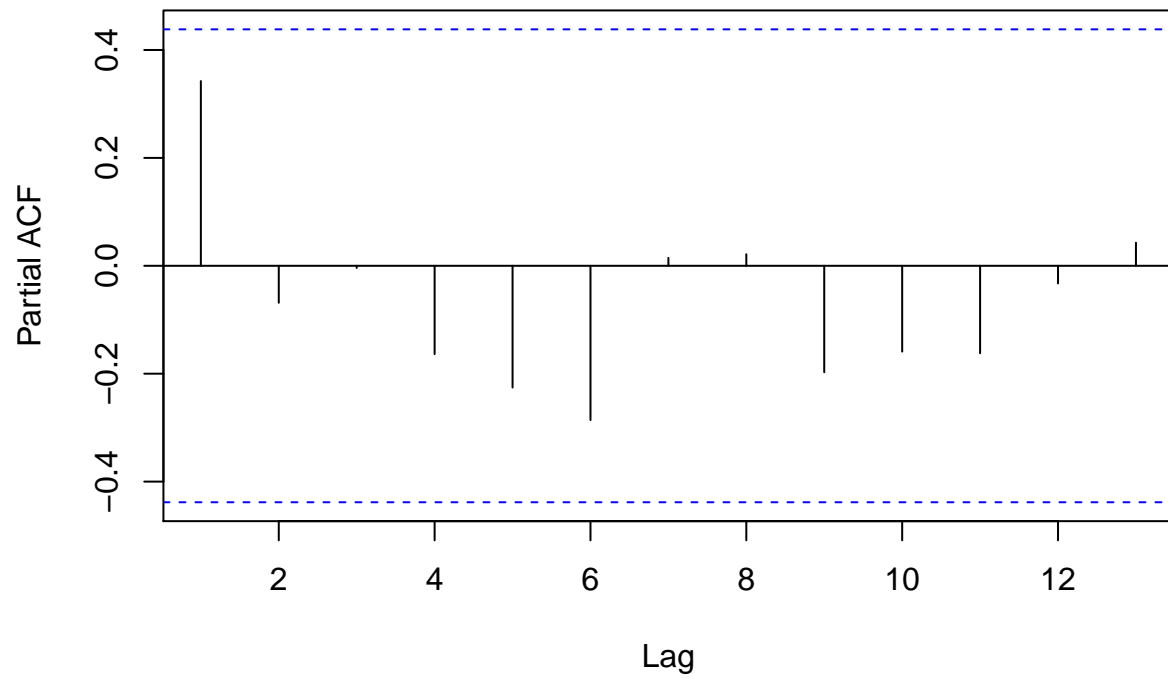
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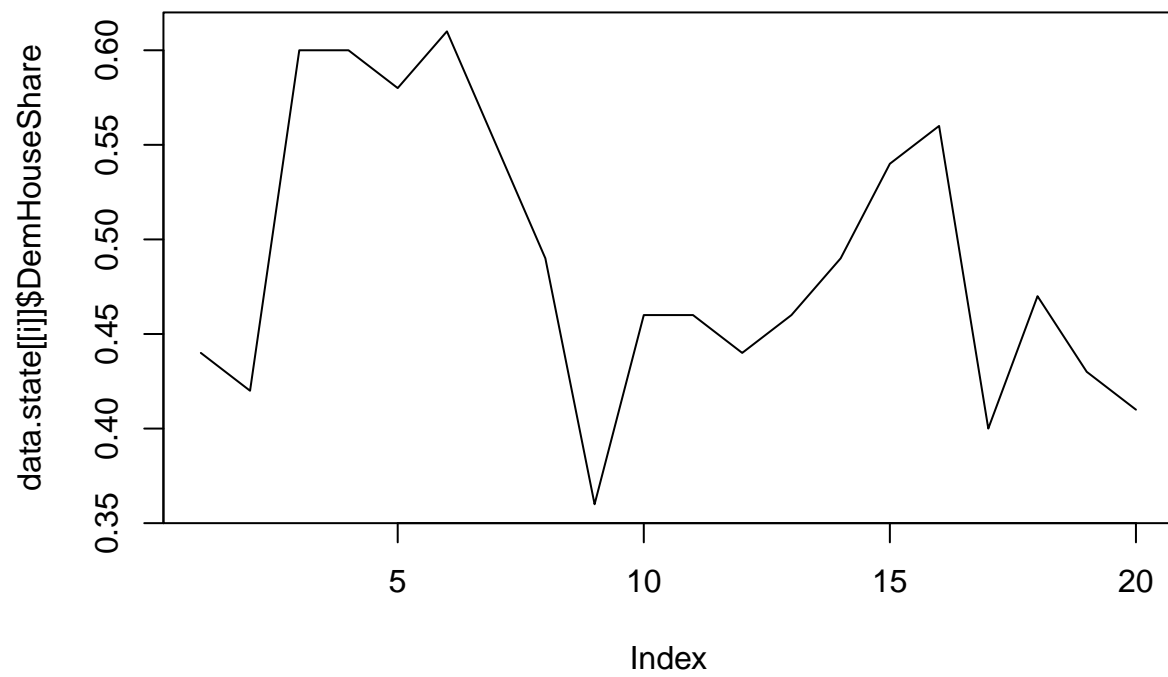


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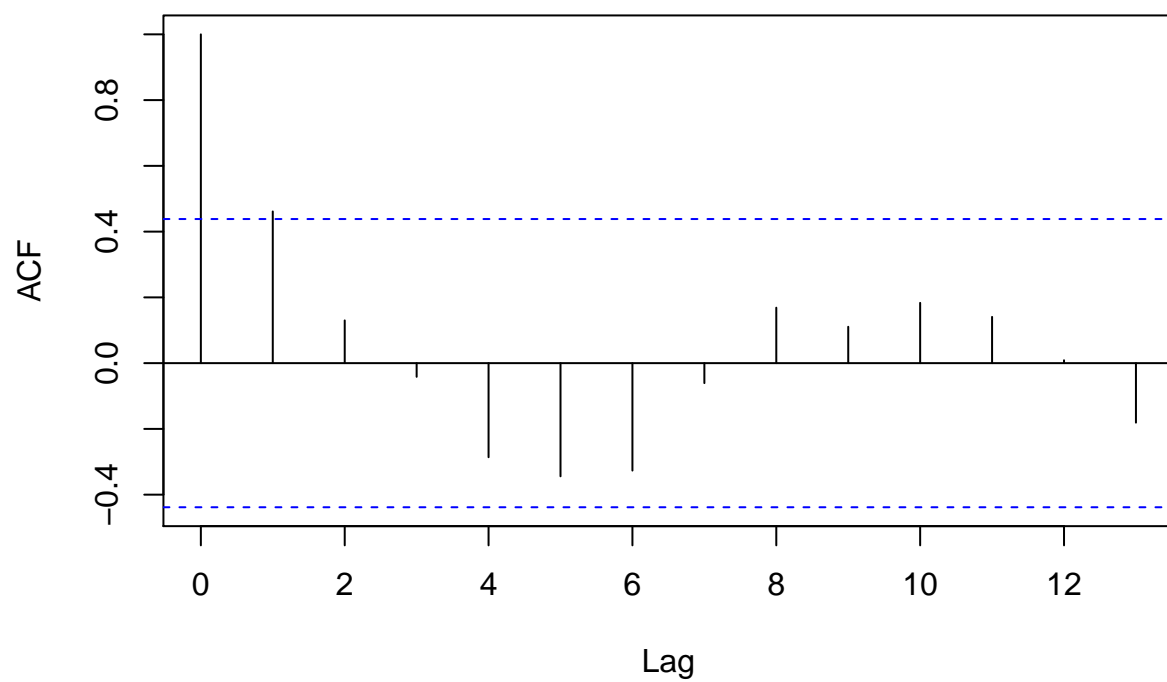


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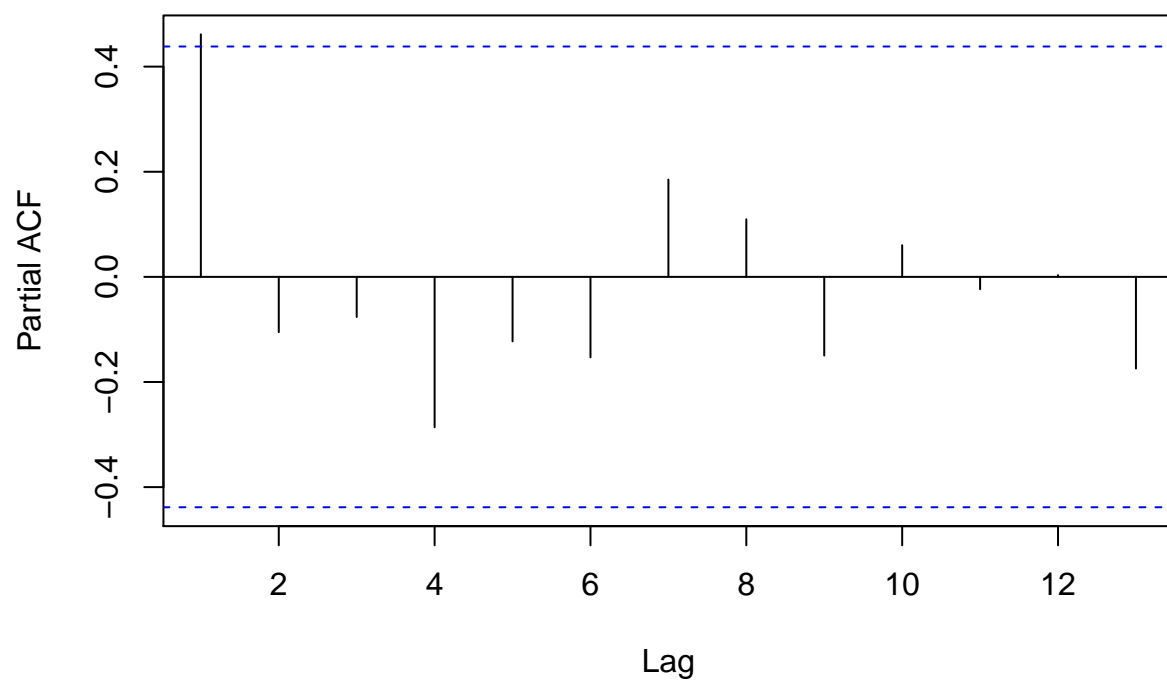




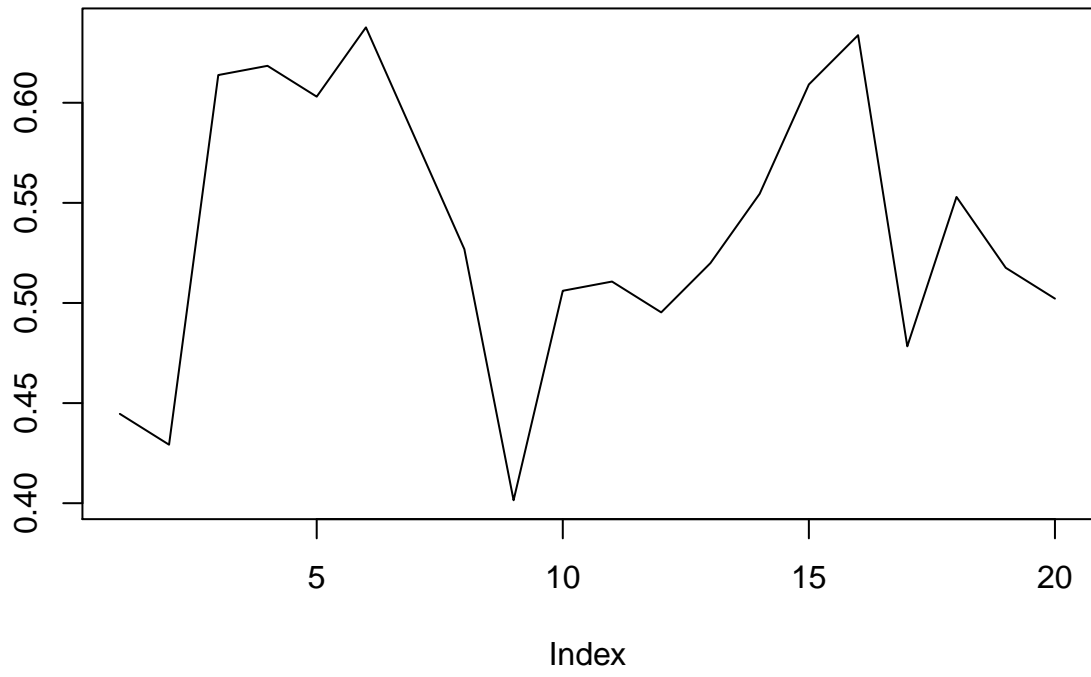
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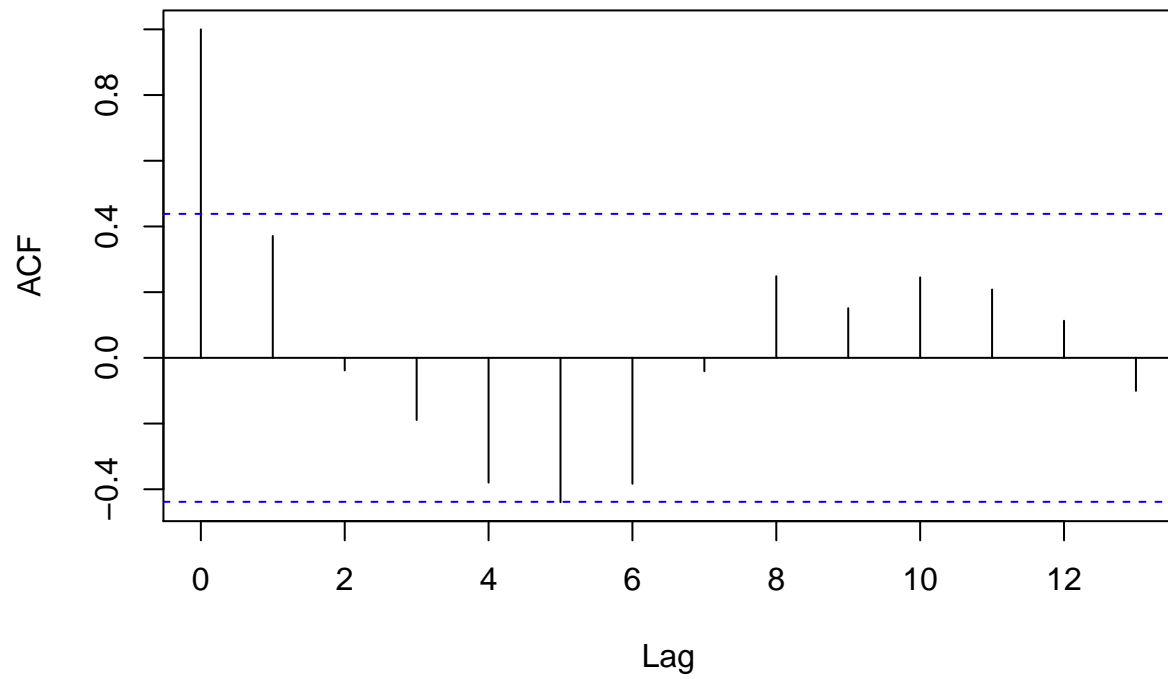
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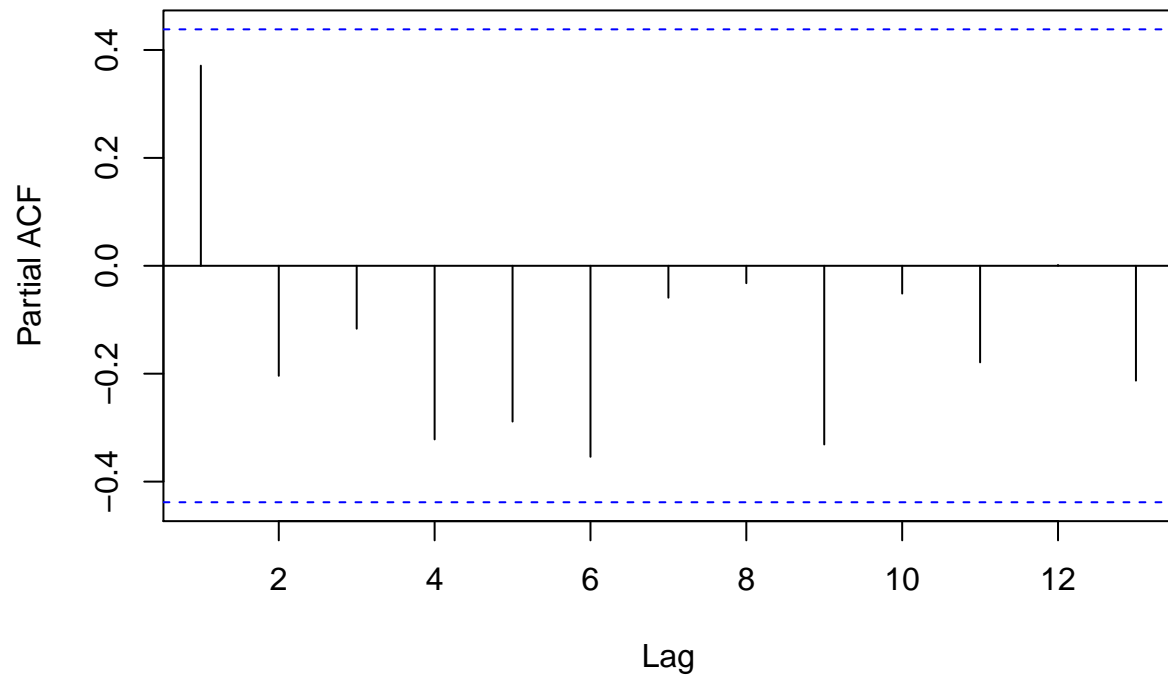
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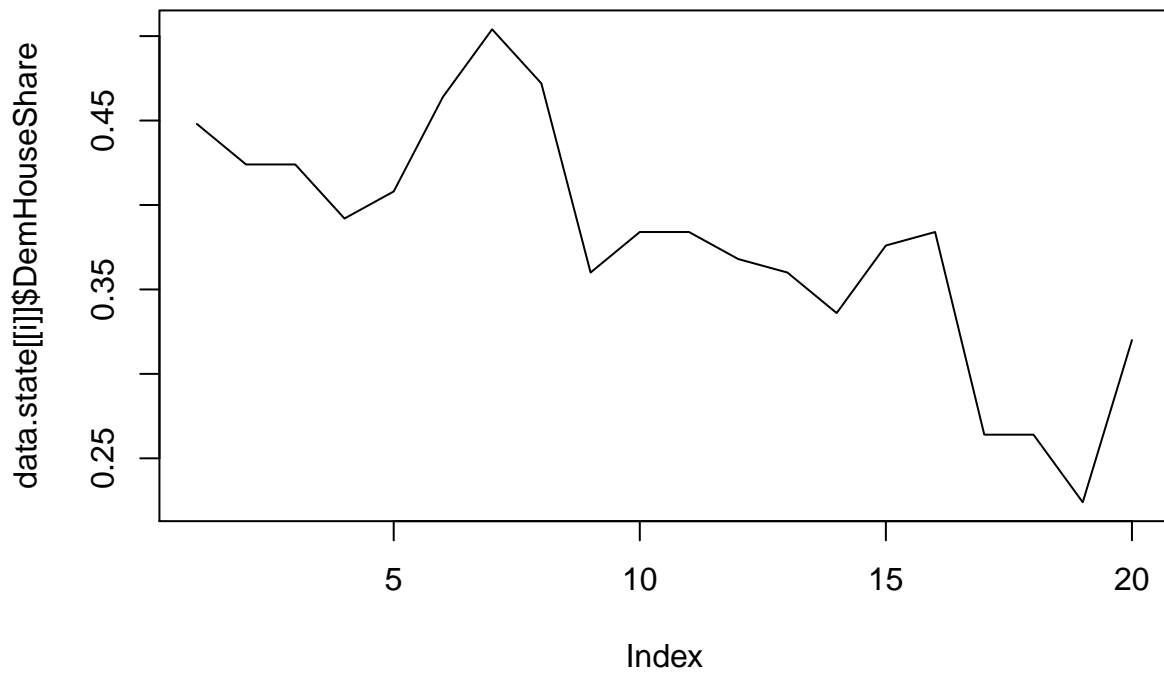


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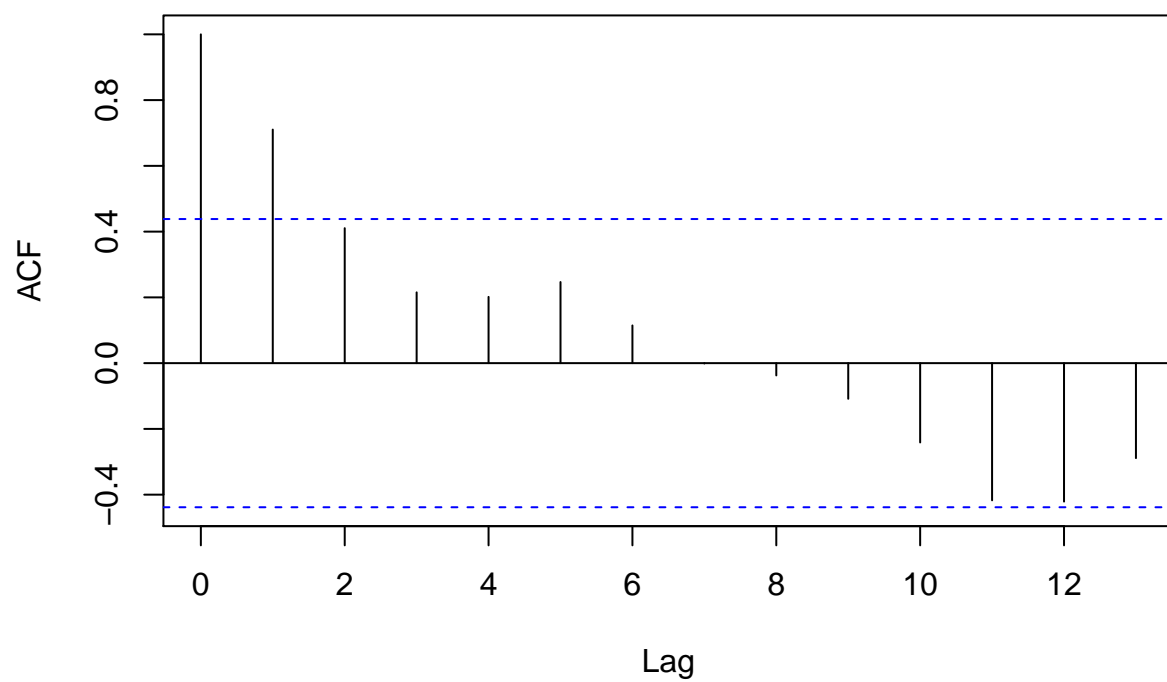


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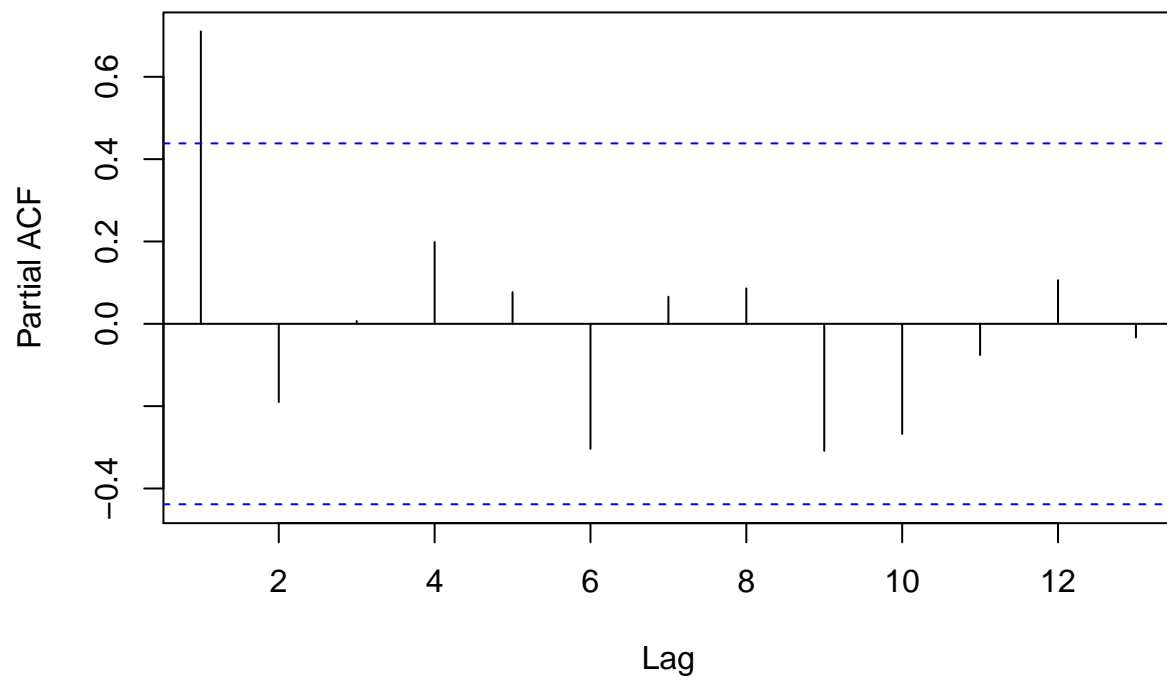




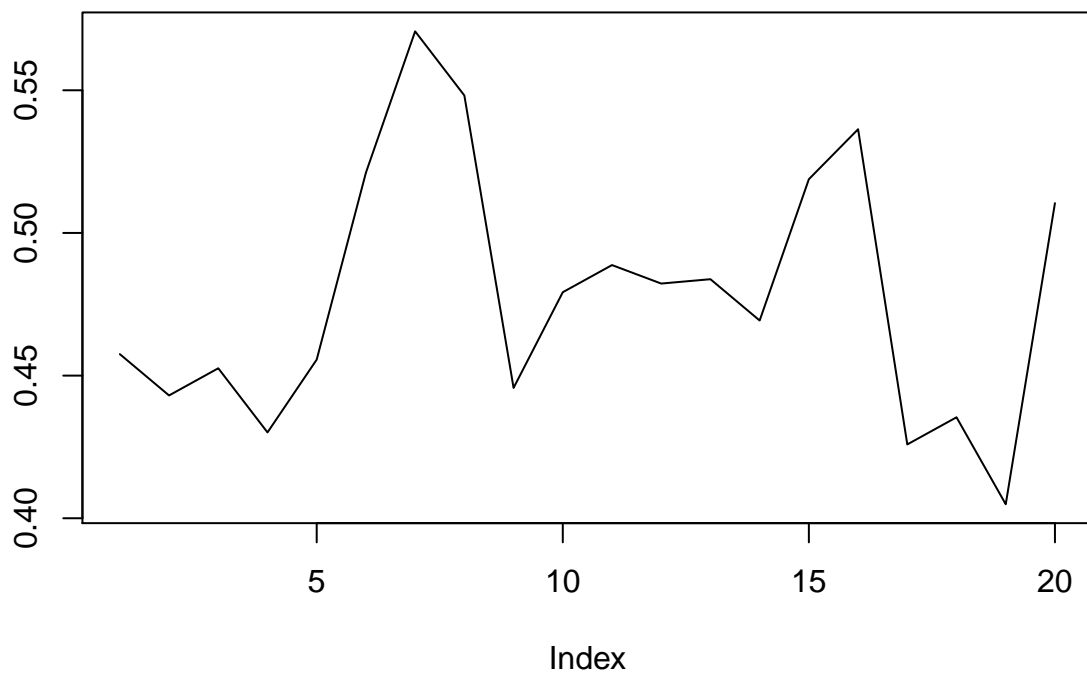
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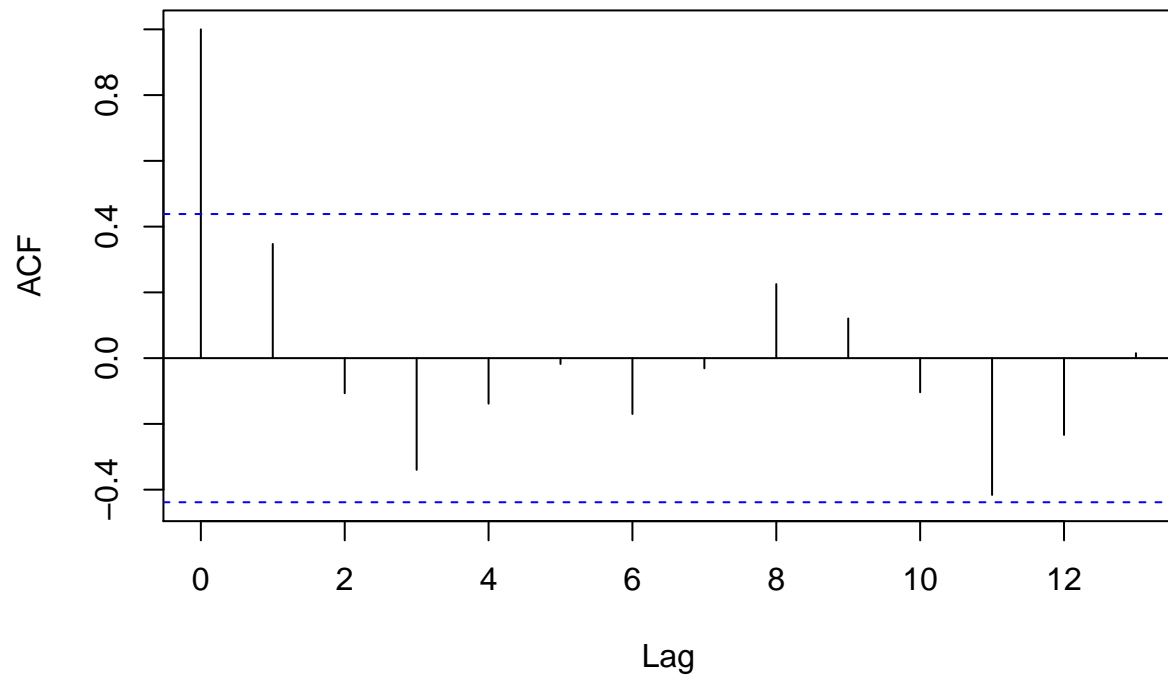
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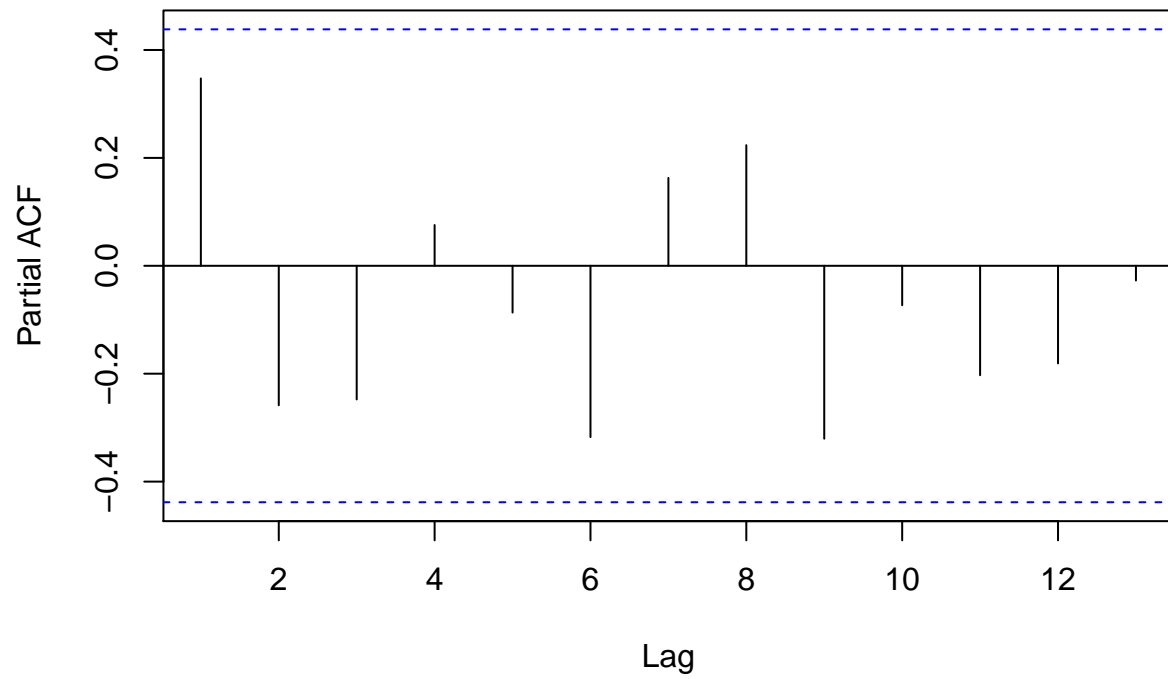
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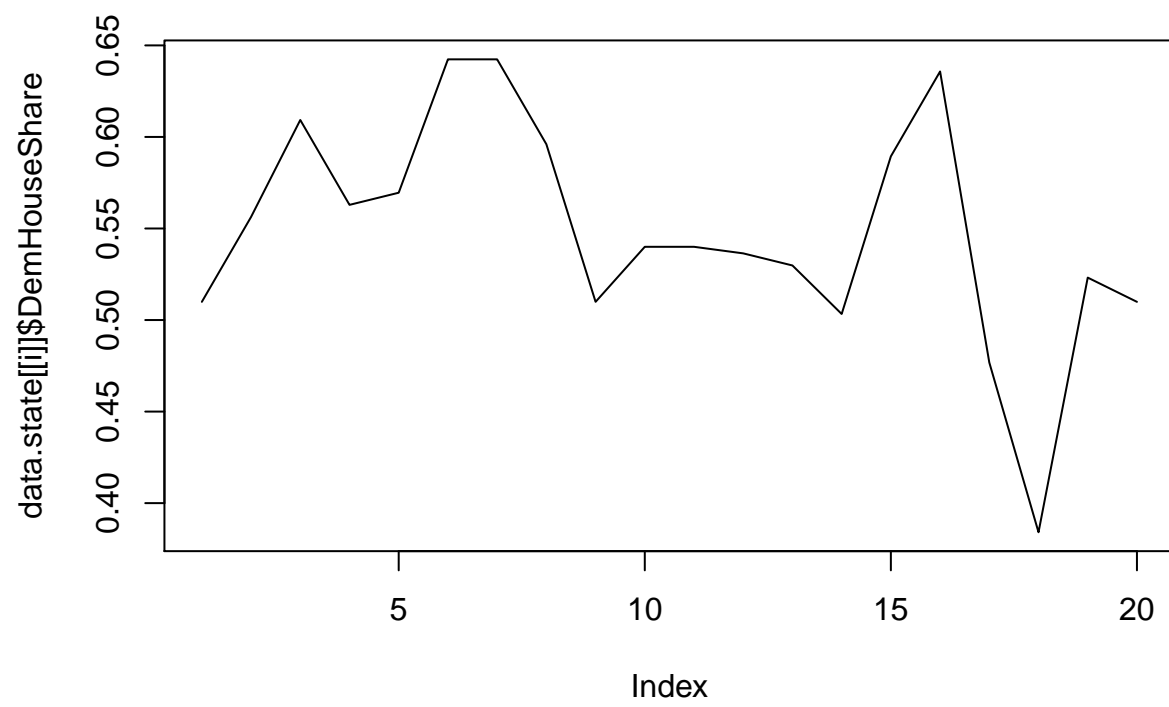


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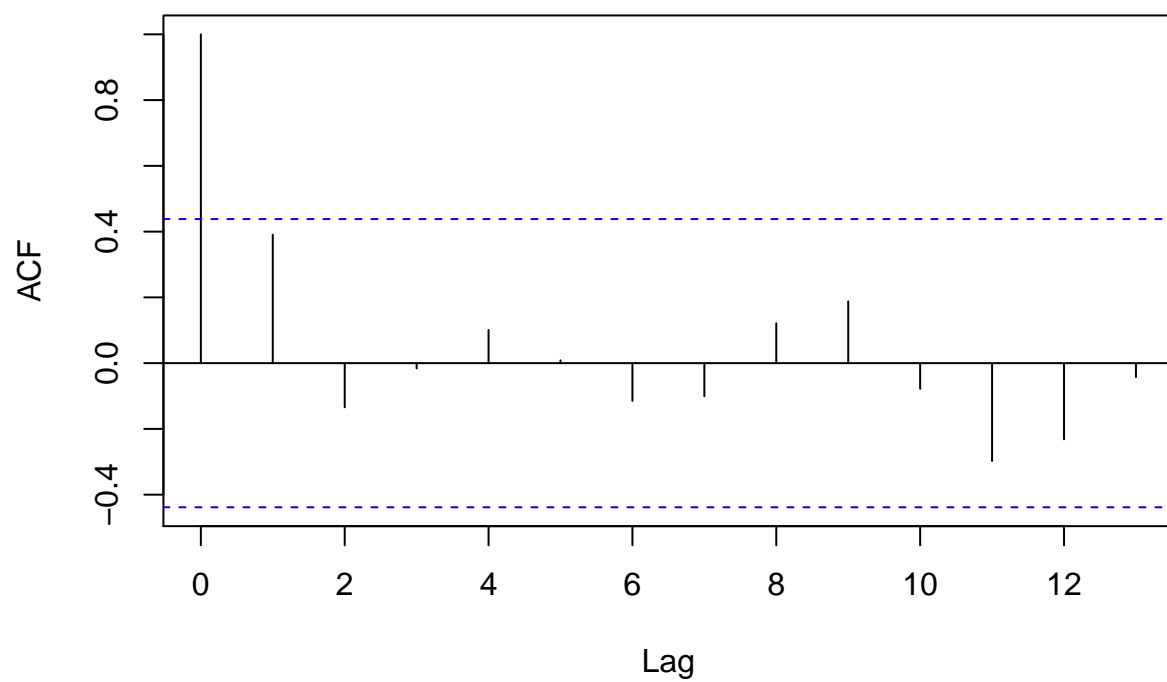


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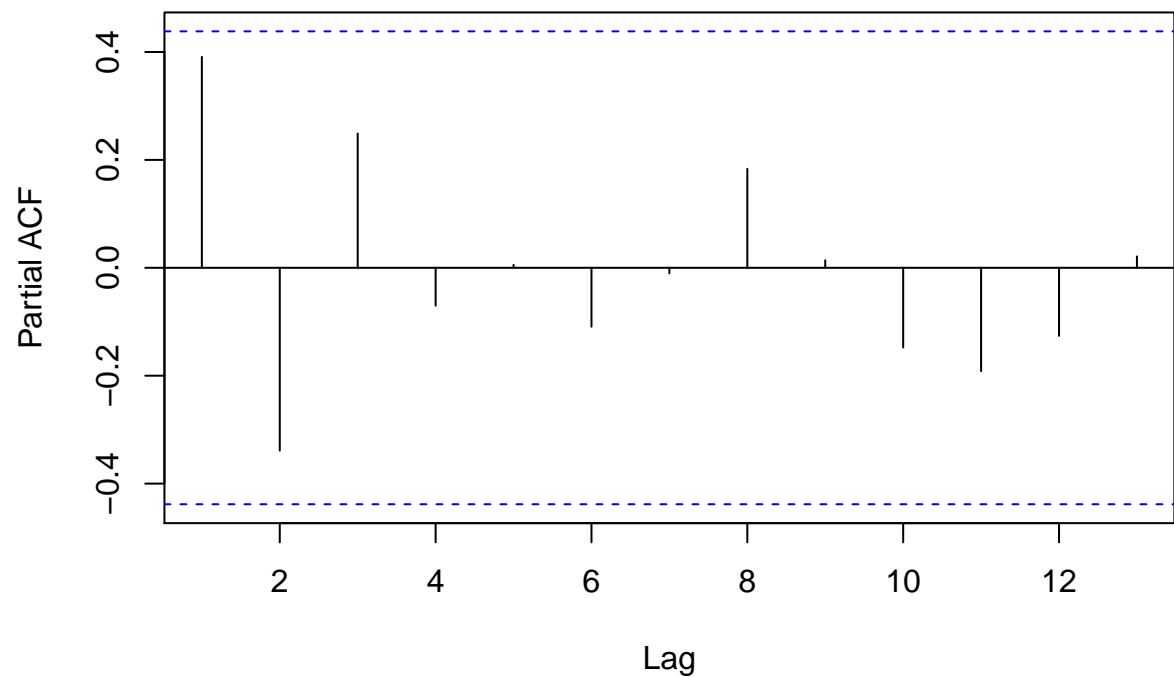




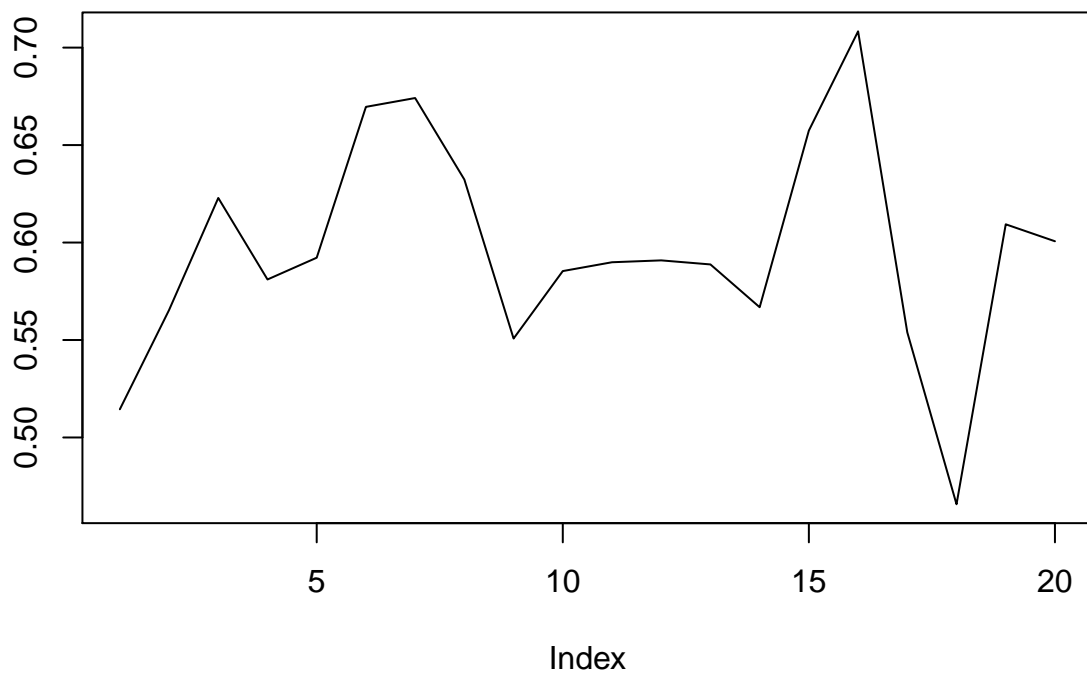
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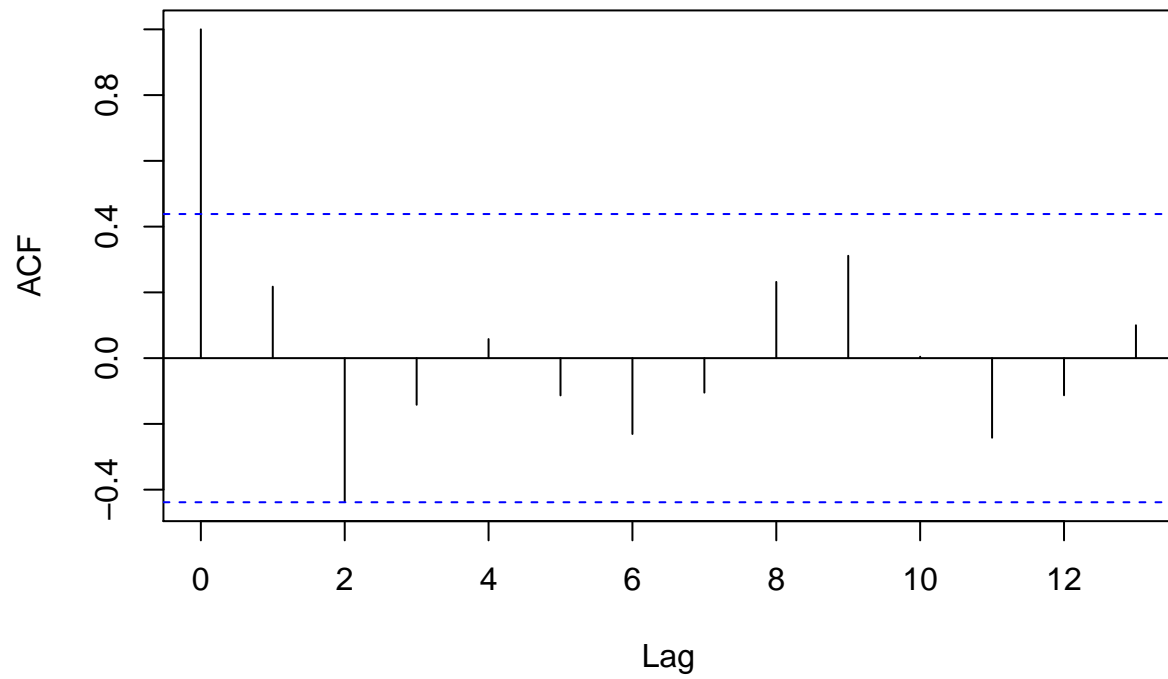
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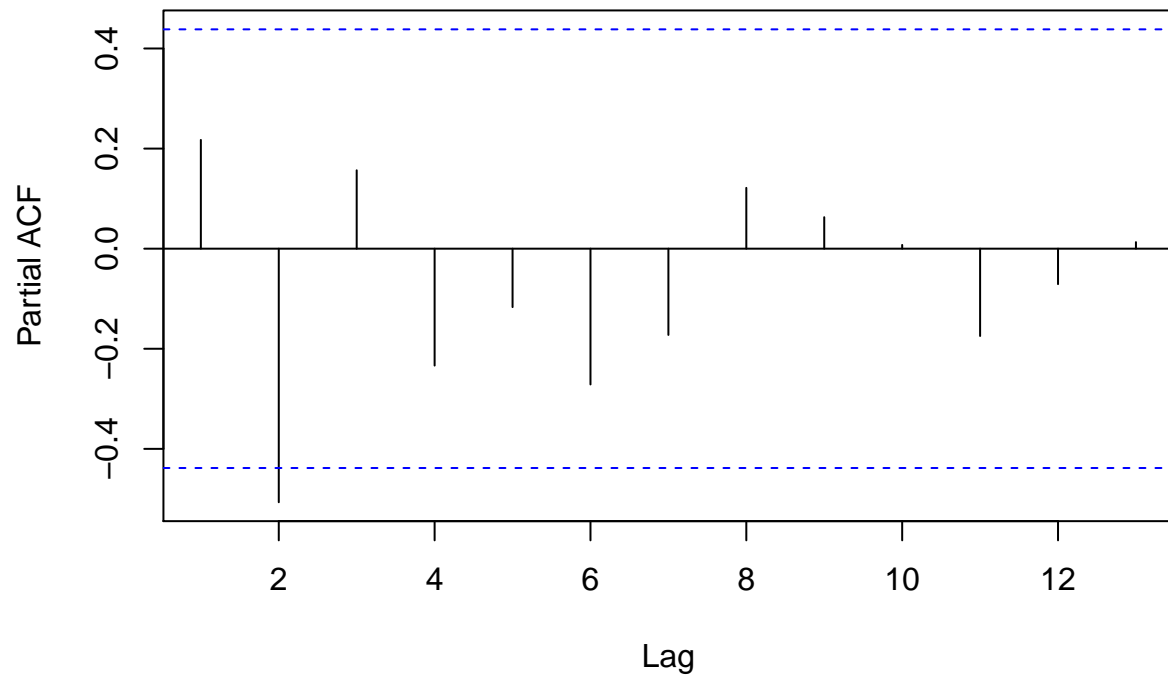
d.ts(ts = data.state[["i"]], \$DemHouseShare, period = data.state[

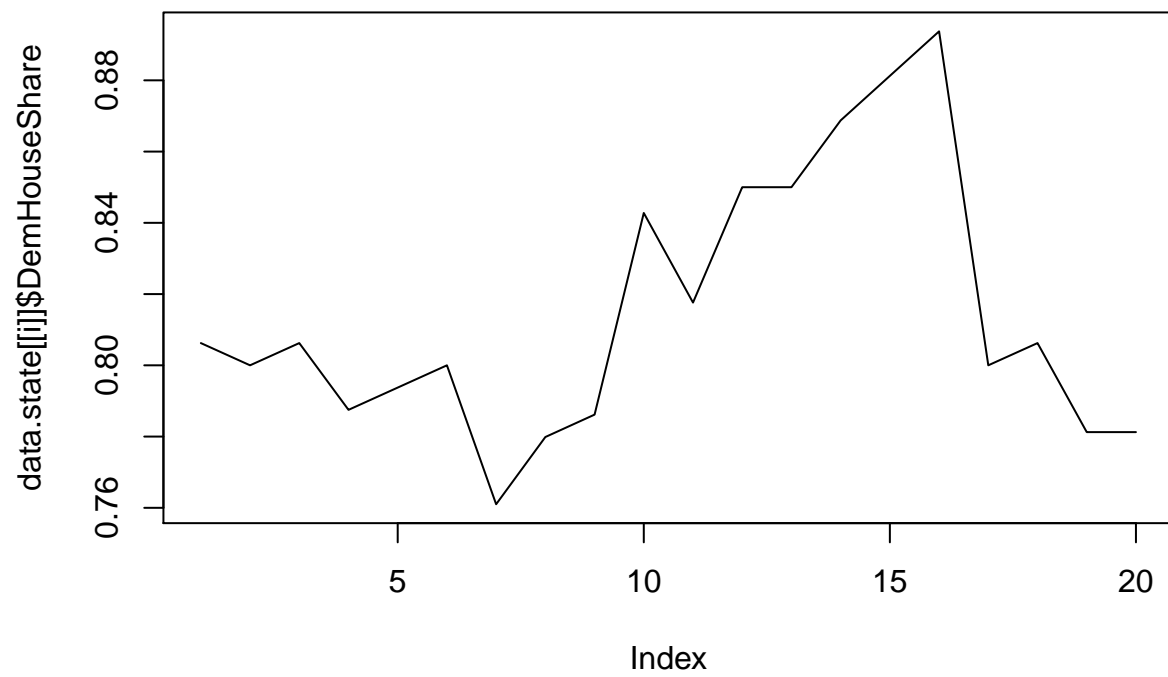


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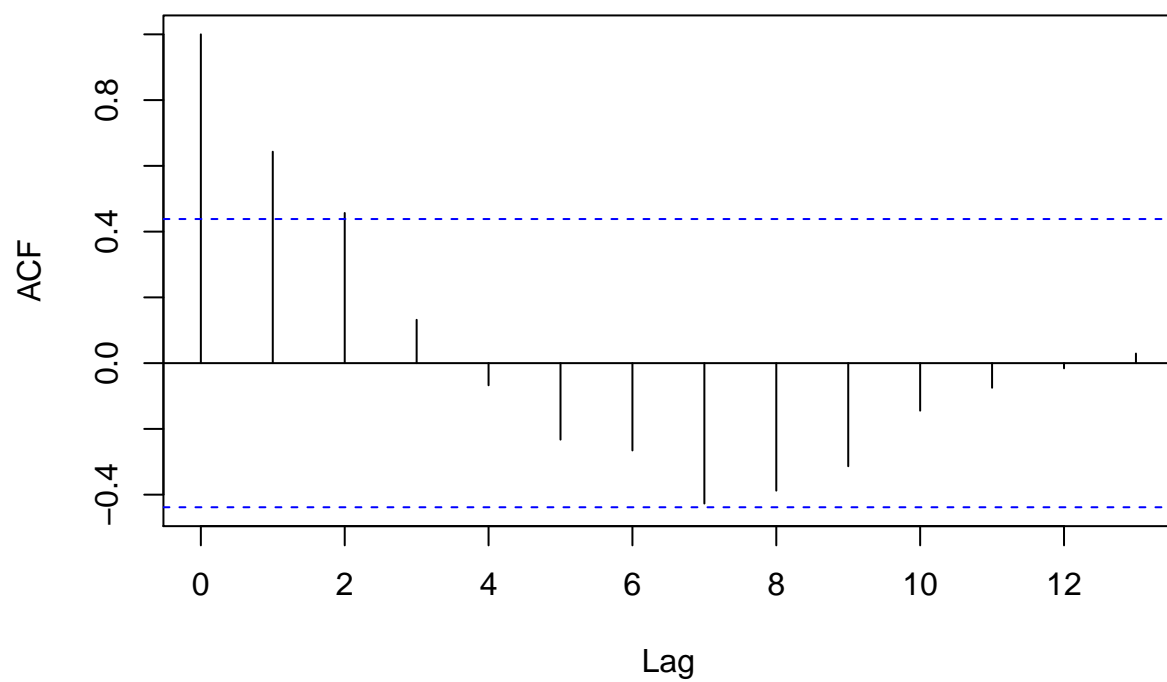



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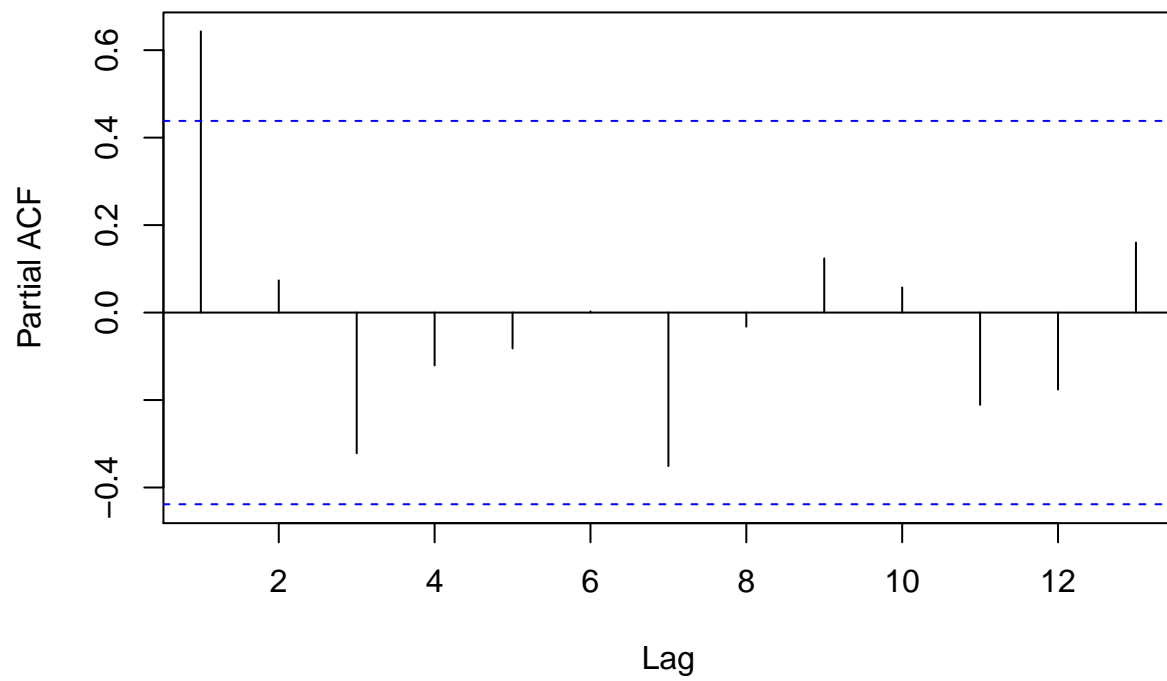




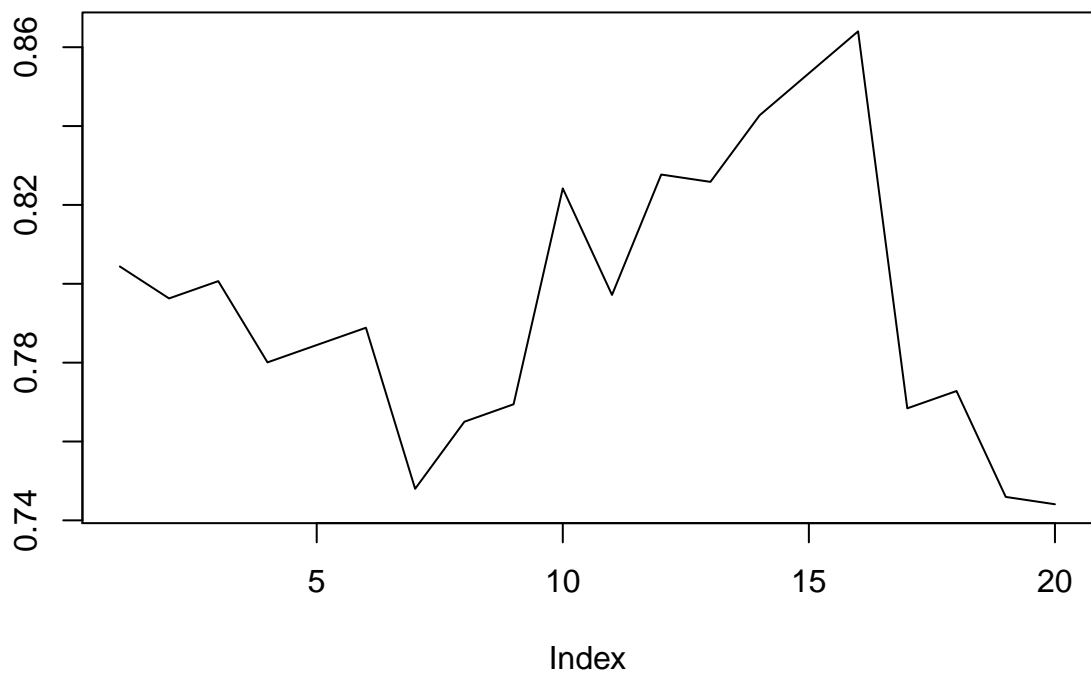
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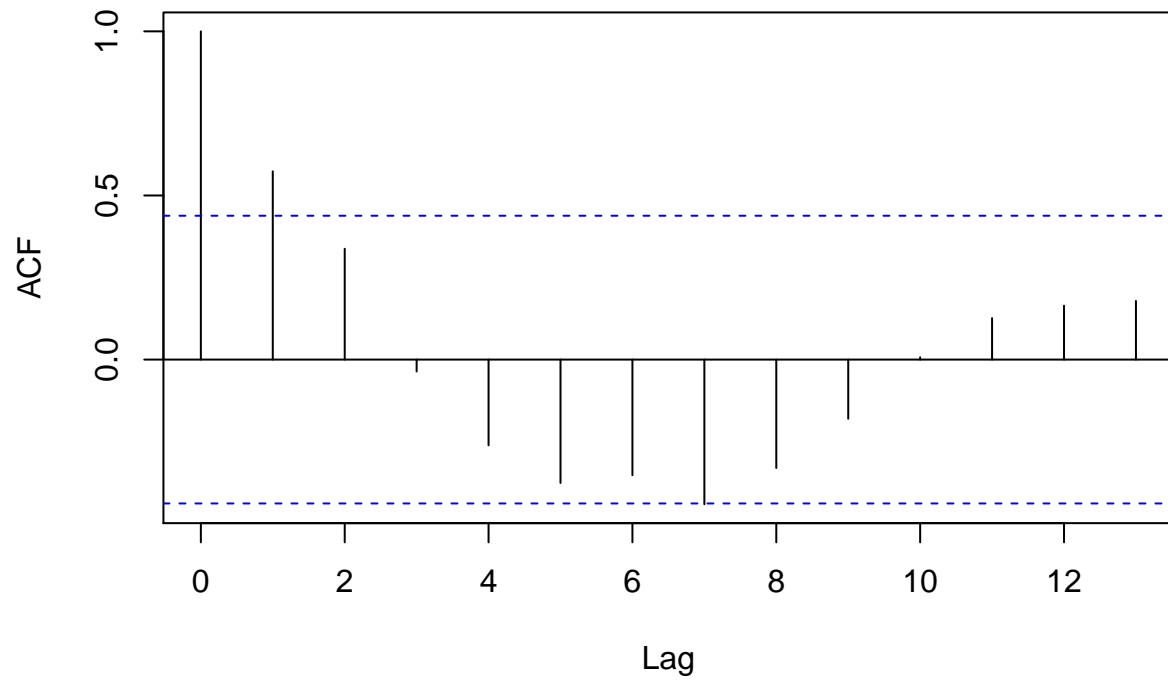
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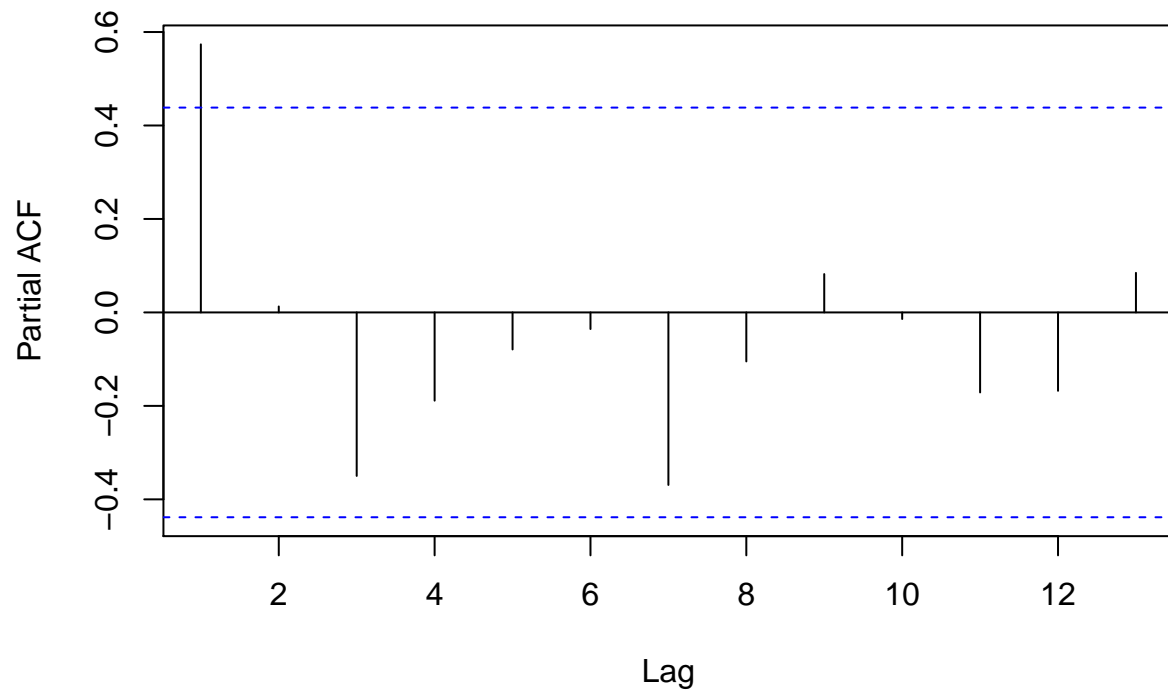
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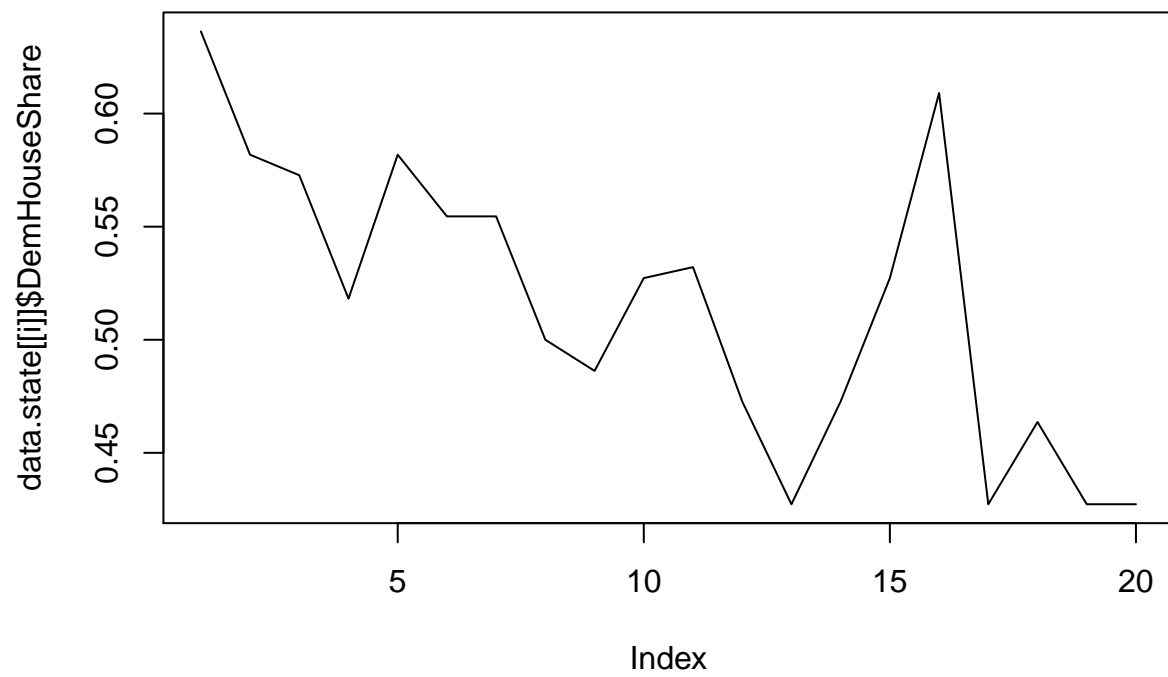


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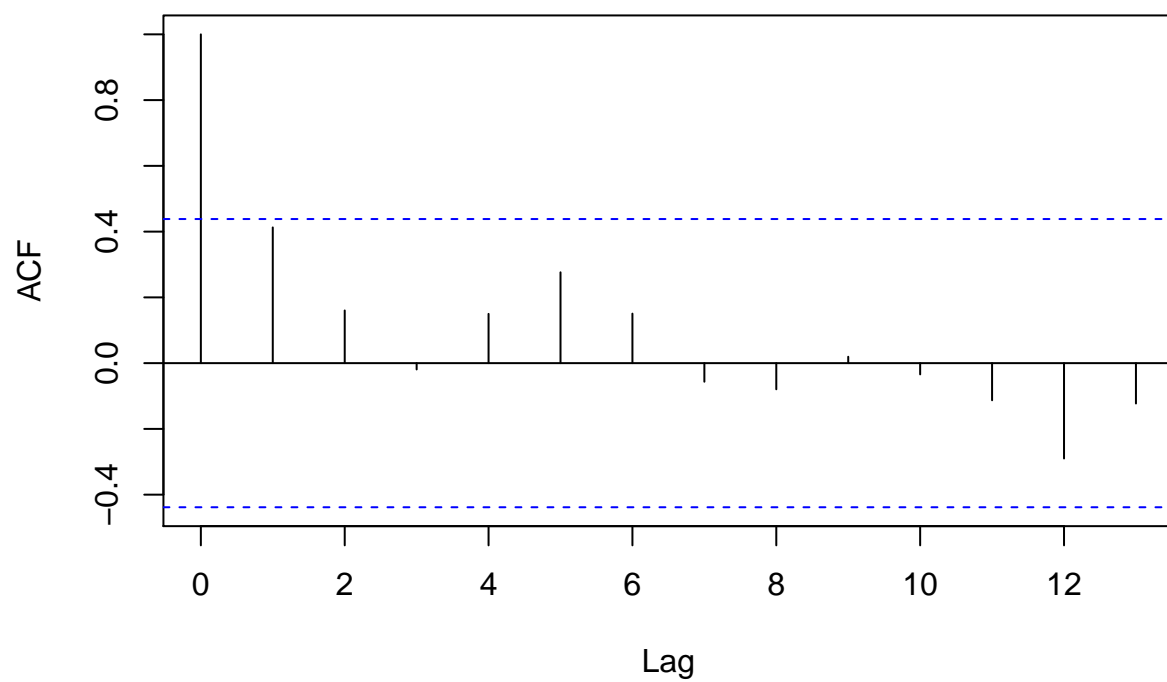


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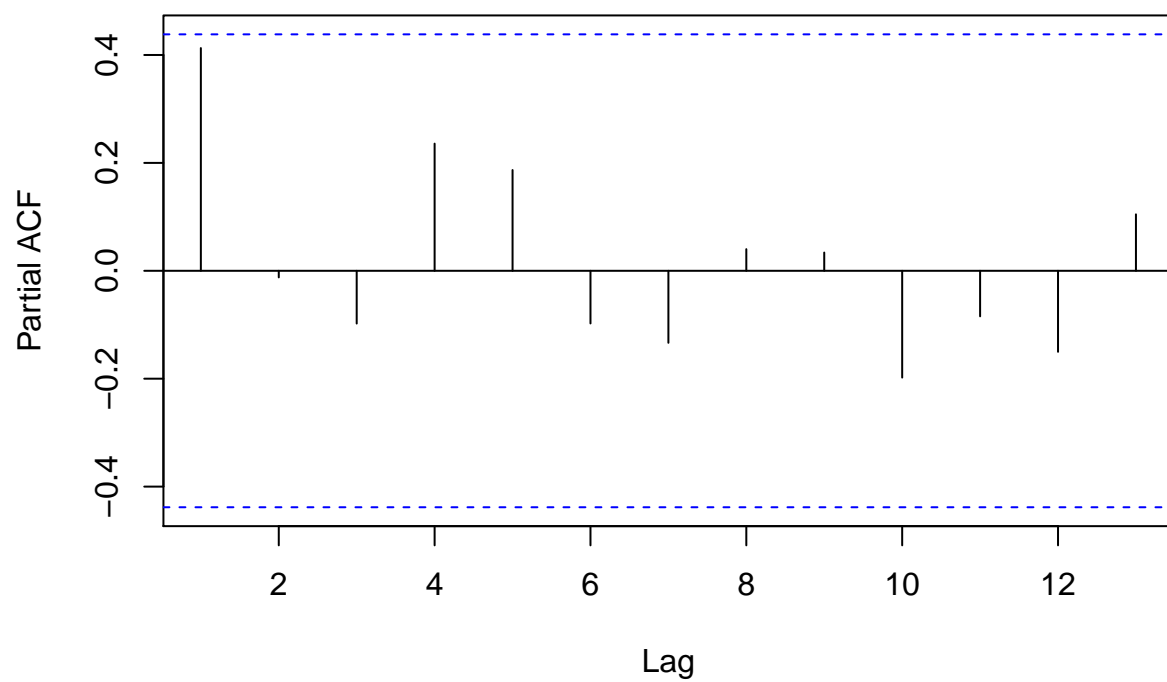




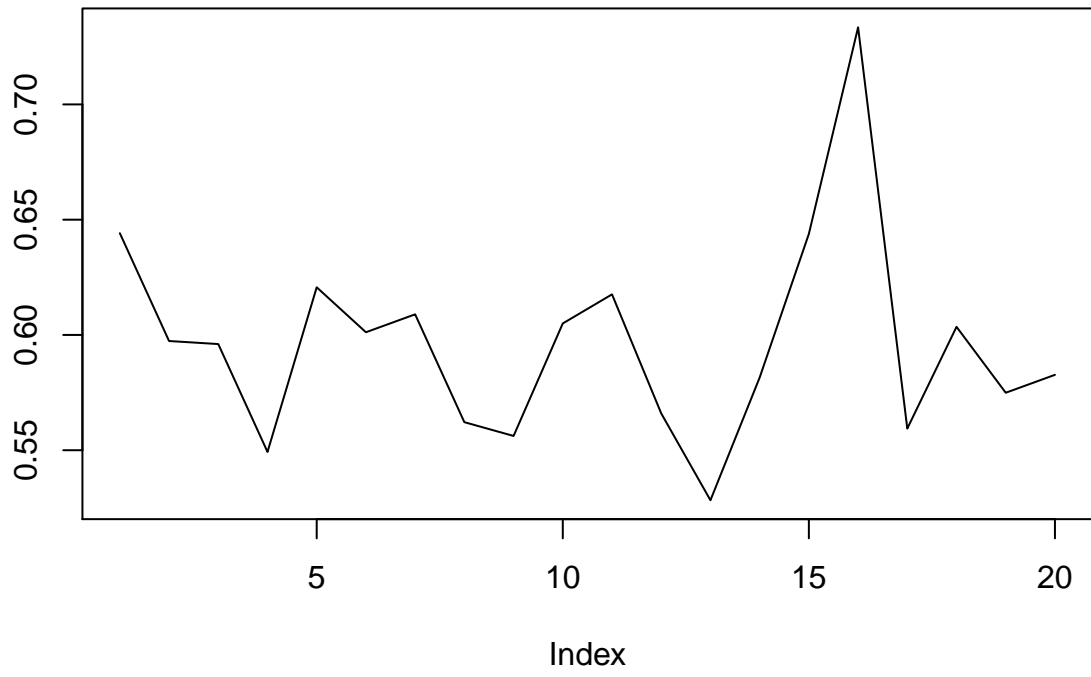
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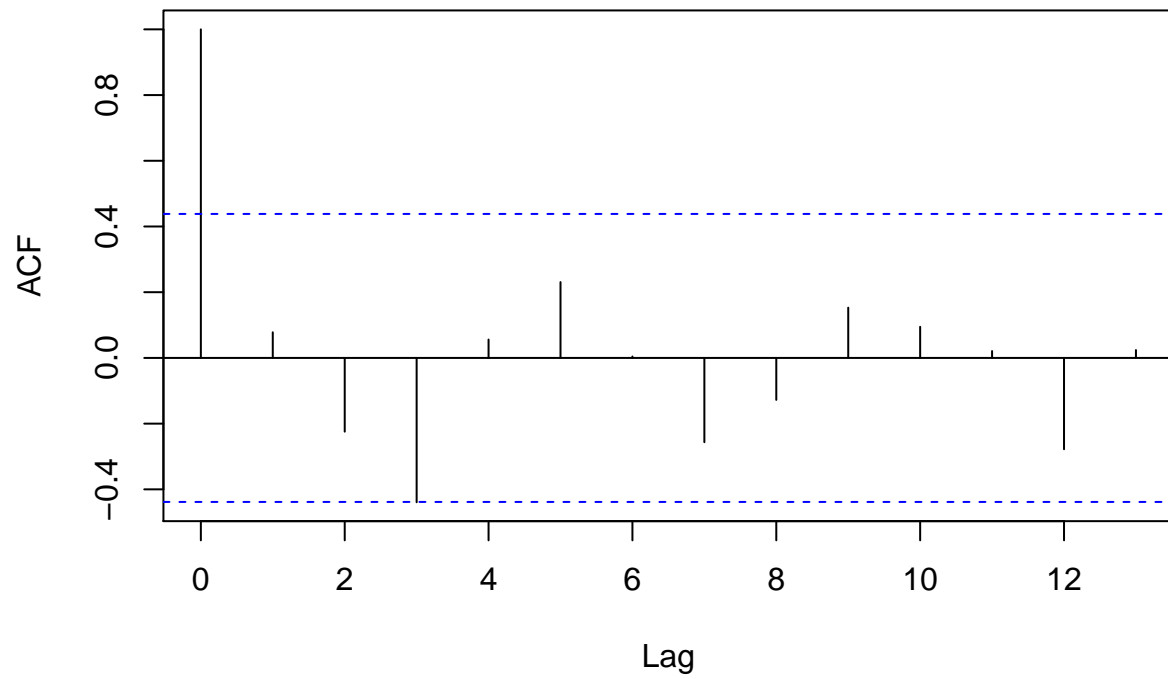
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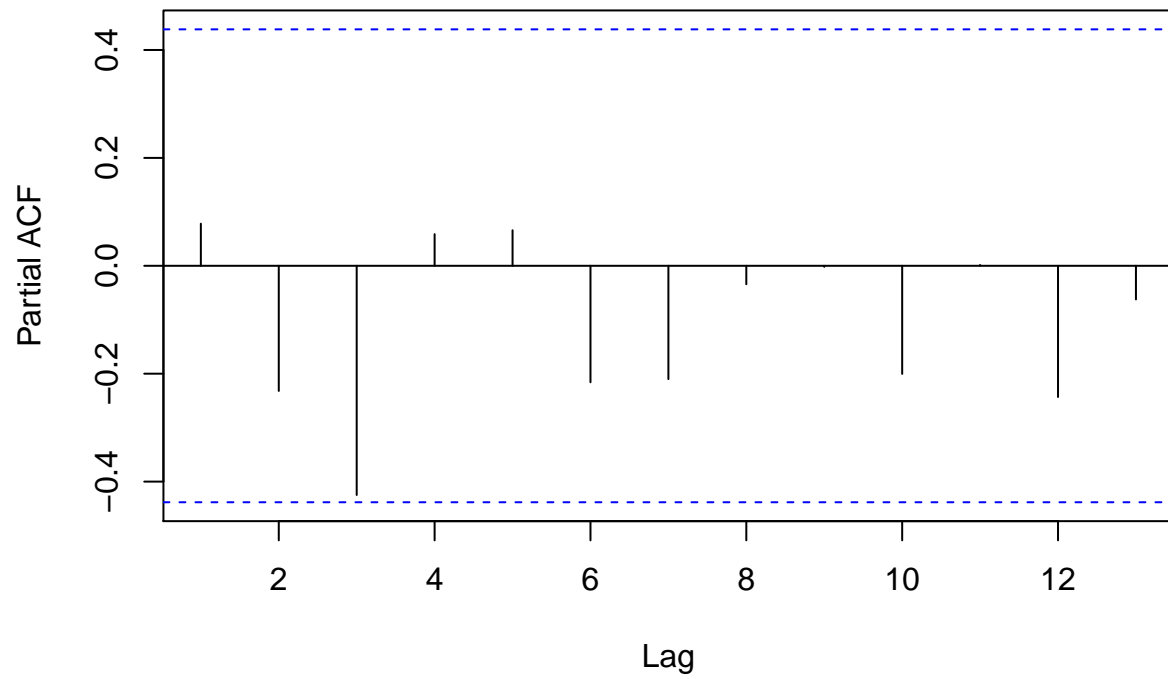
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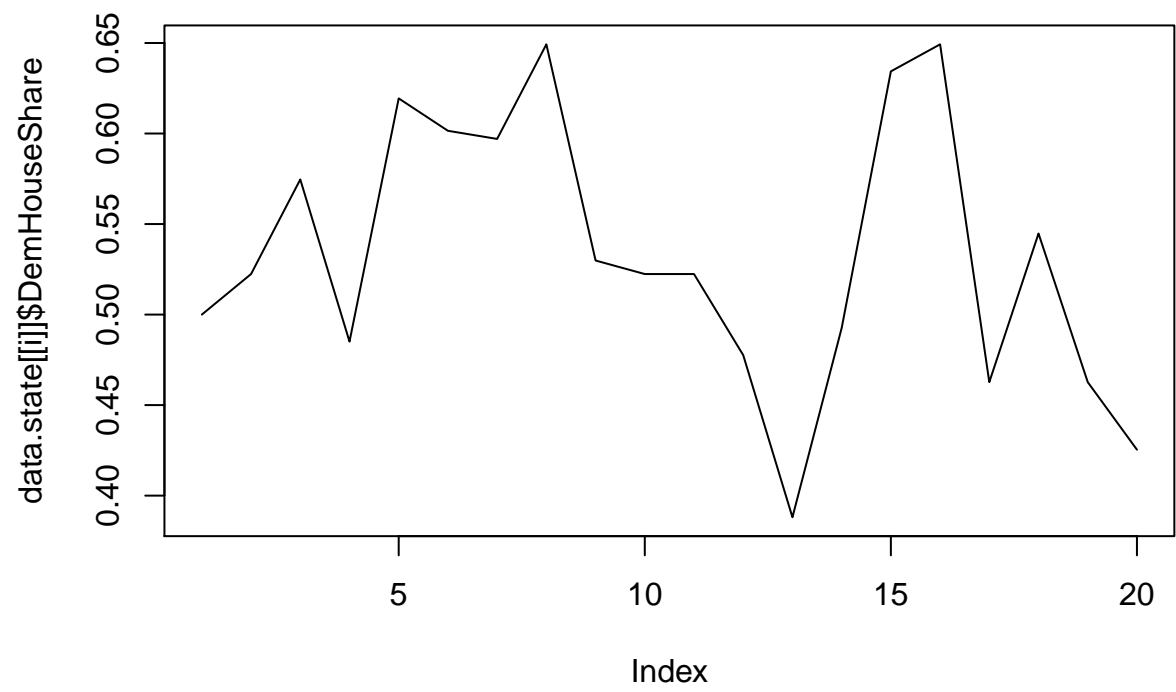


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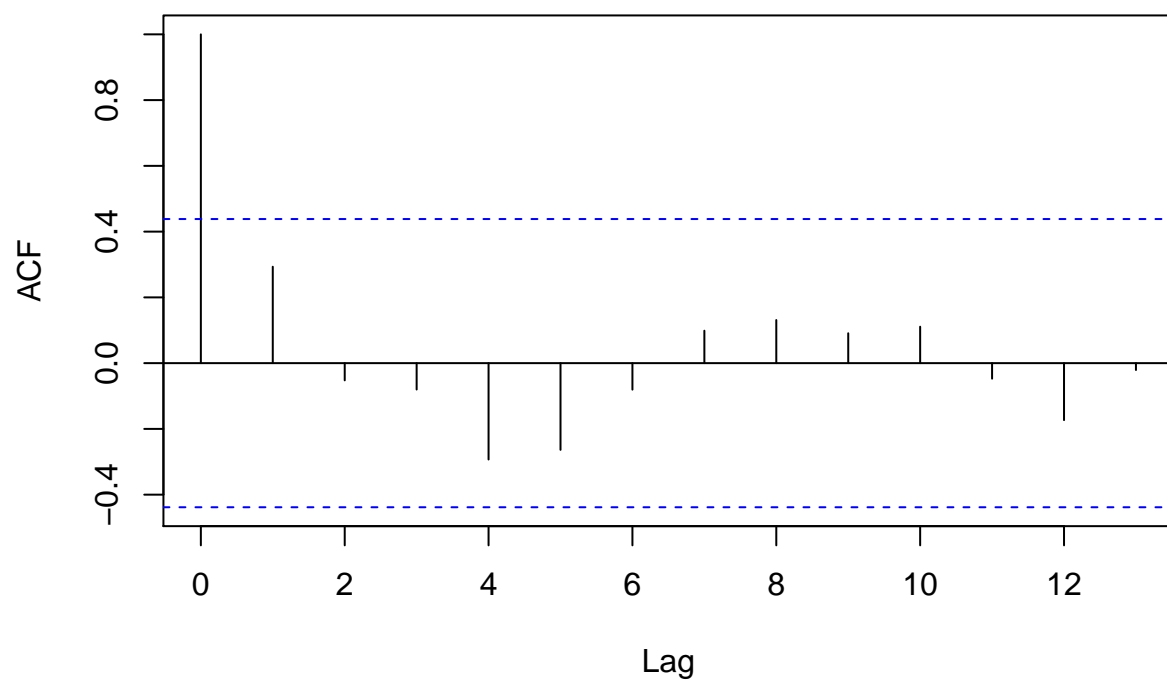


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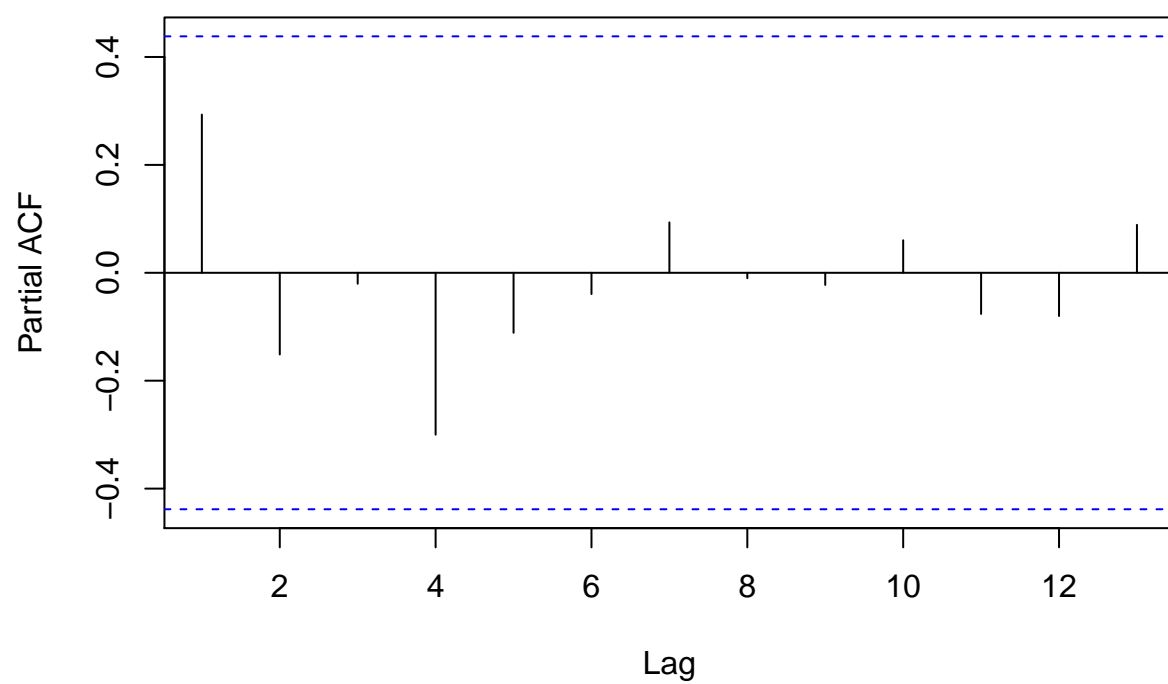




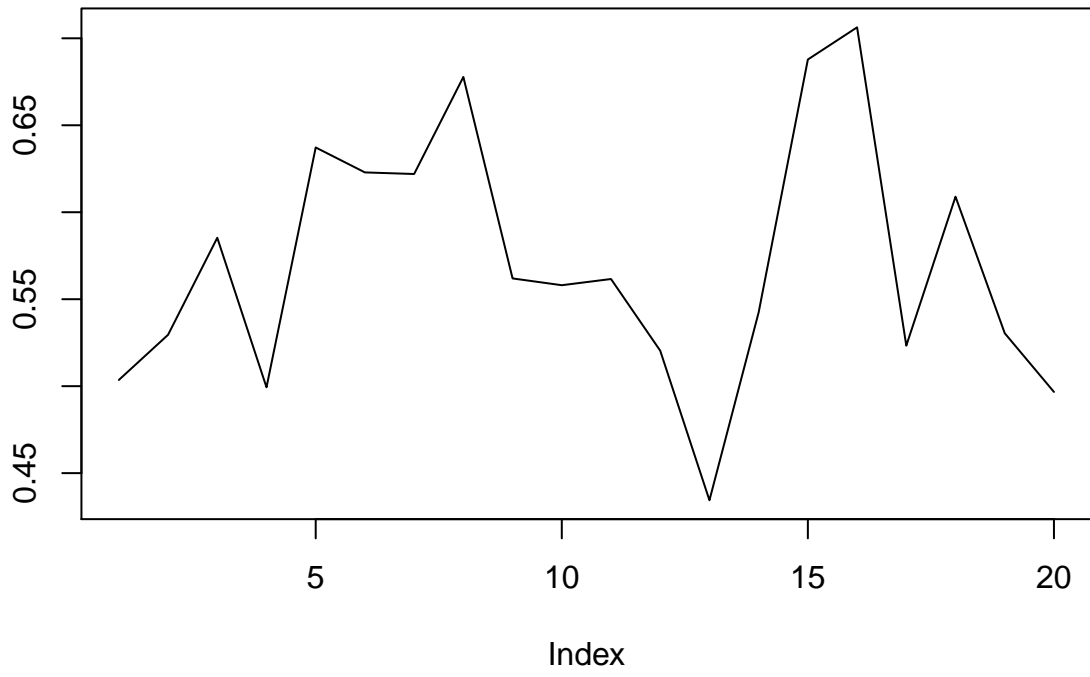
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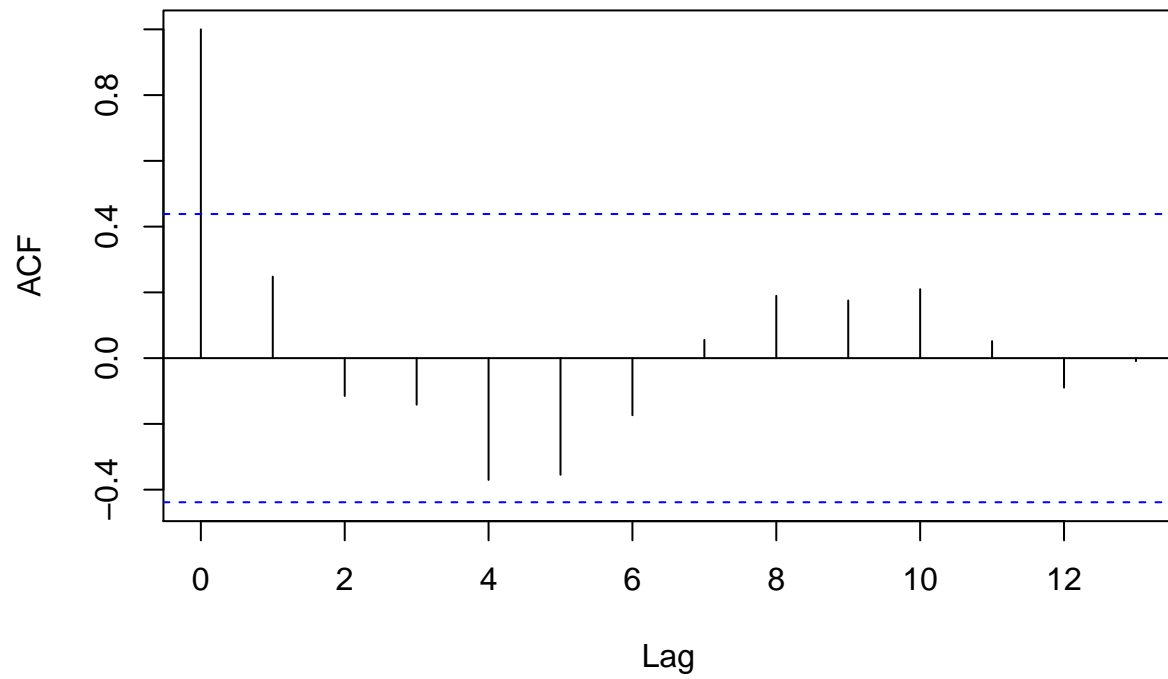
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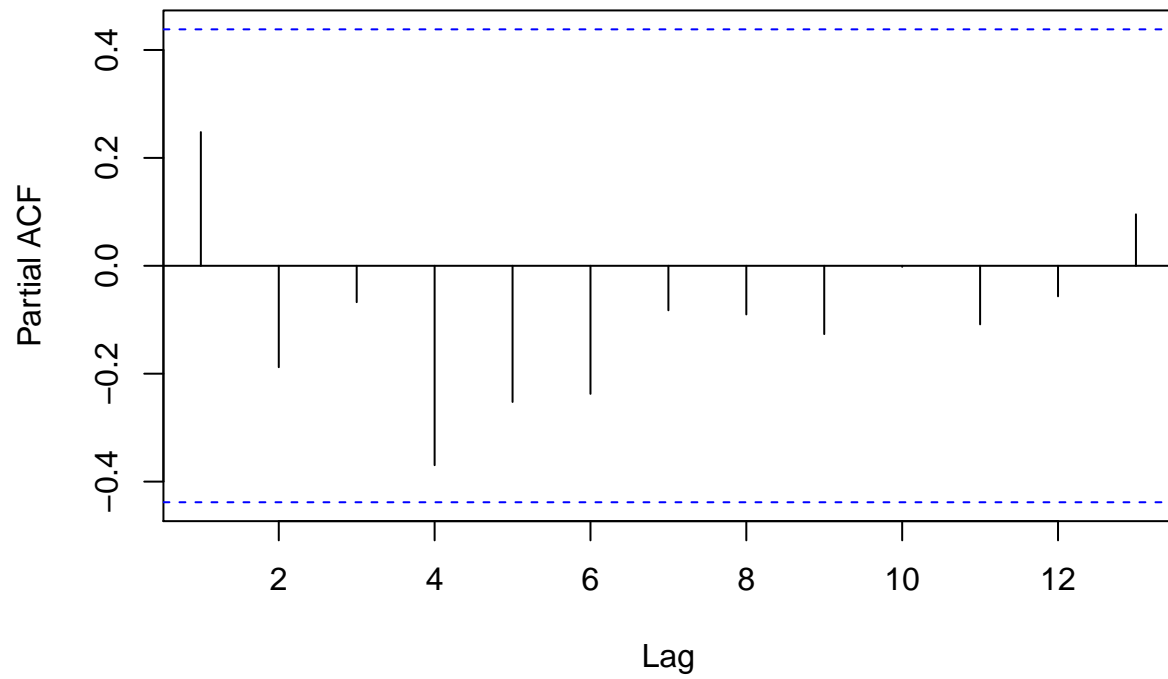
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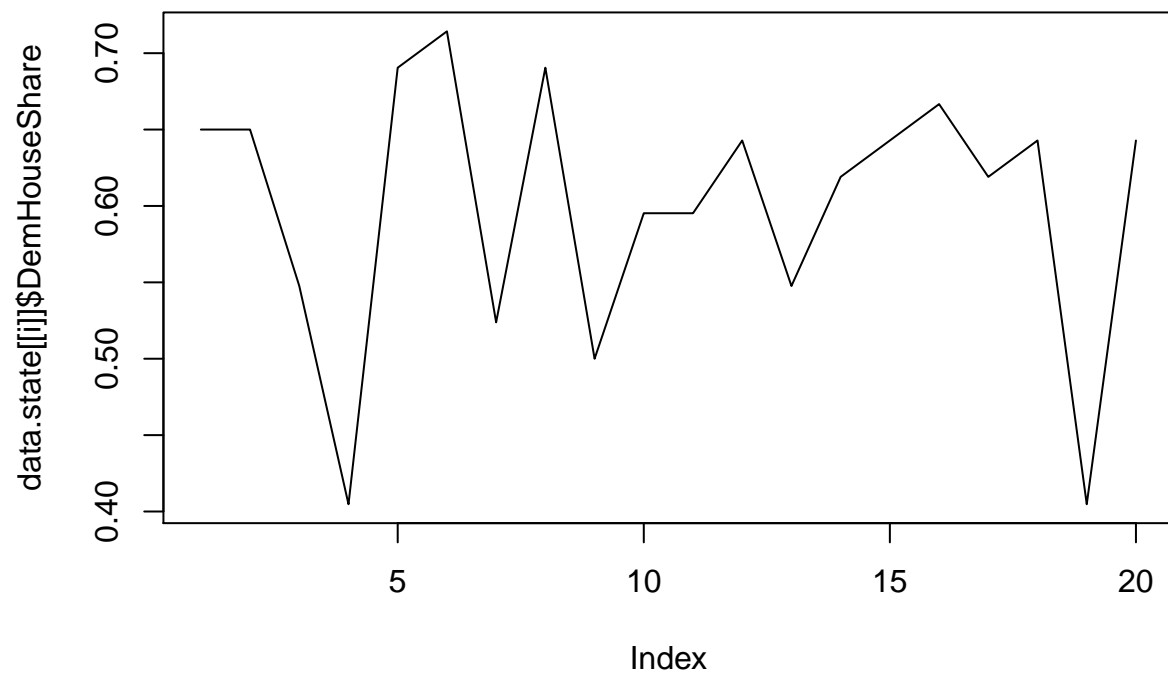


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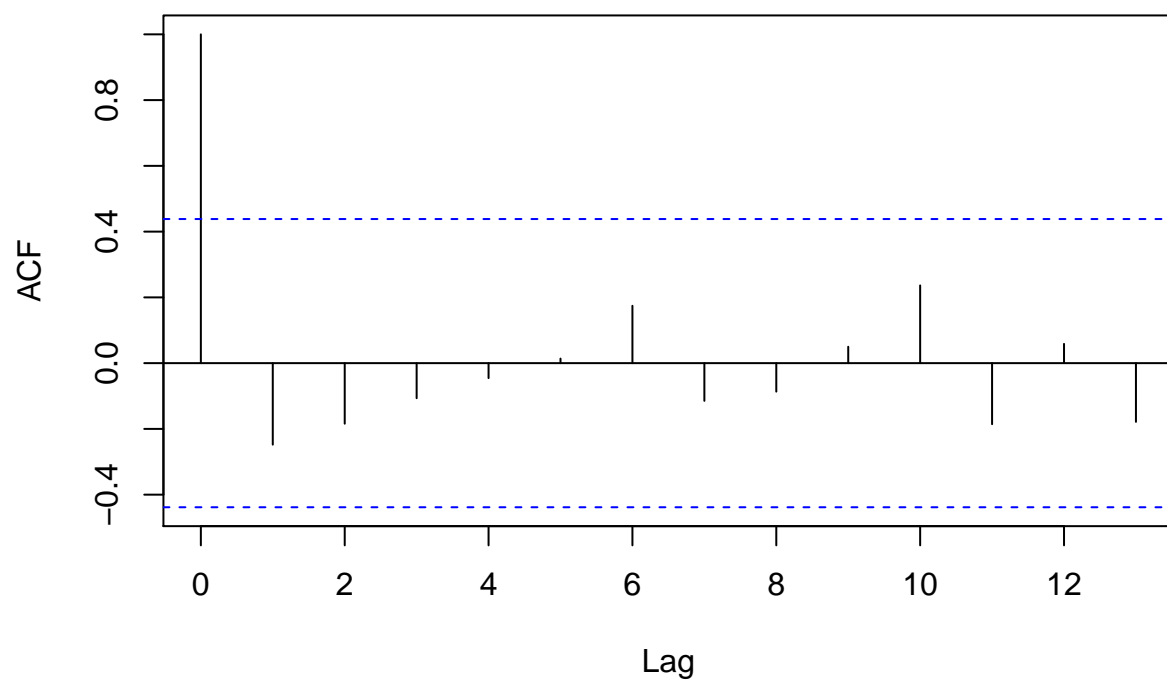


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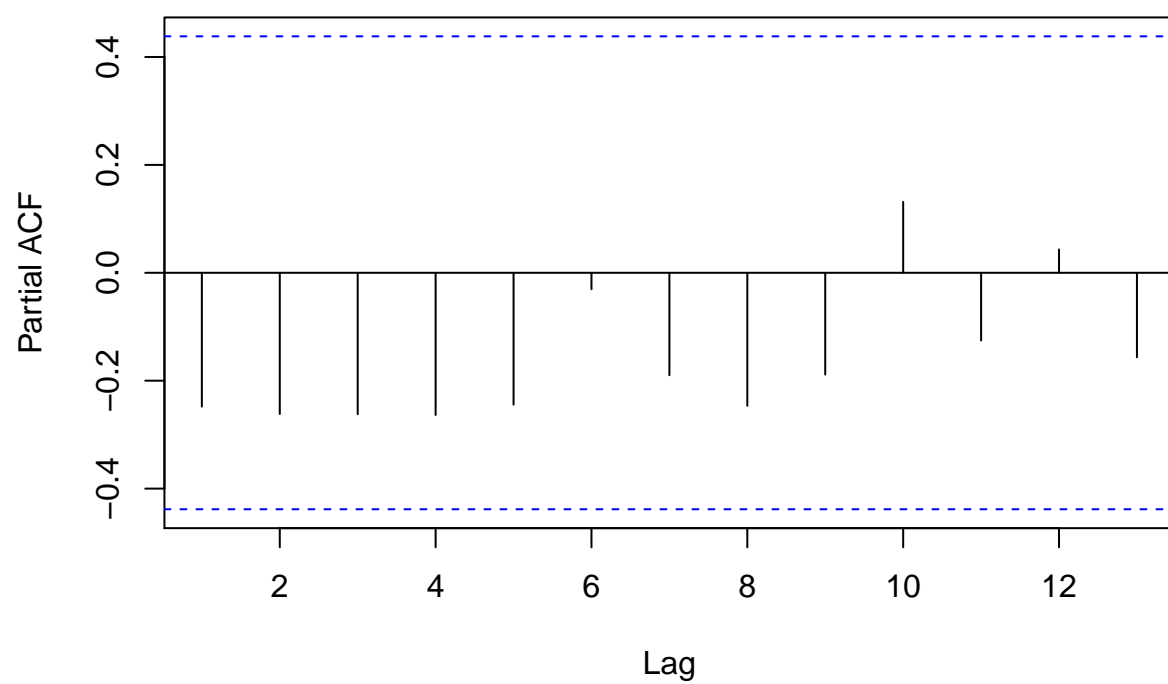




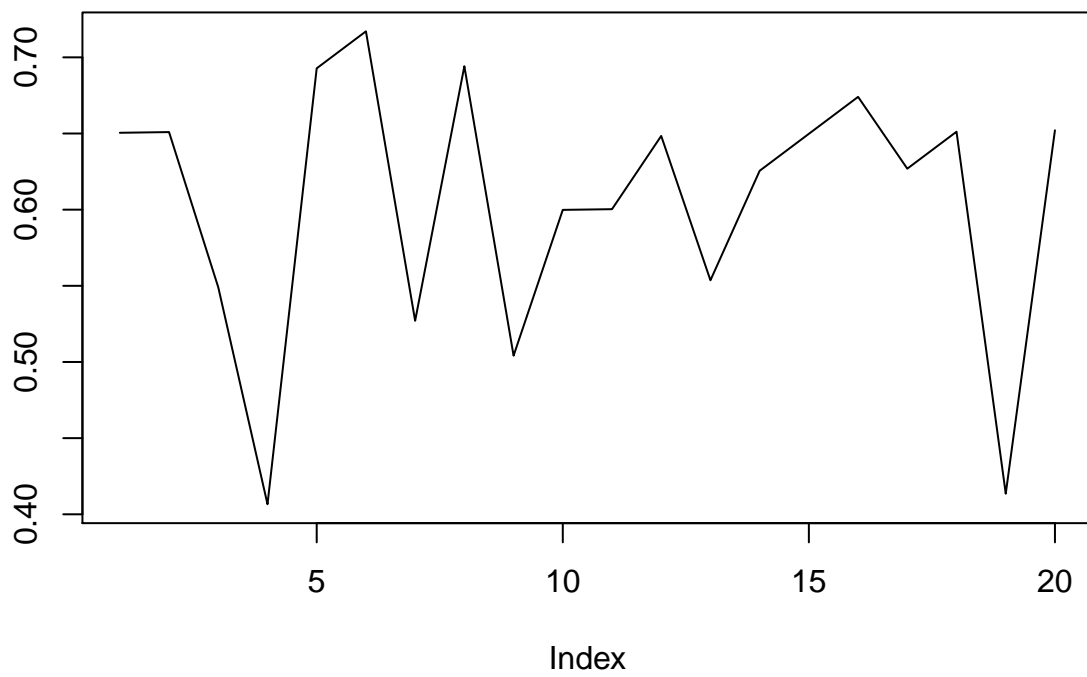
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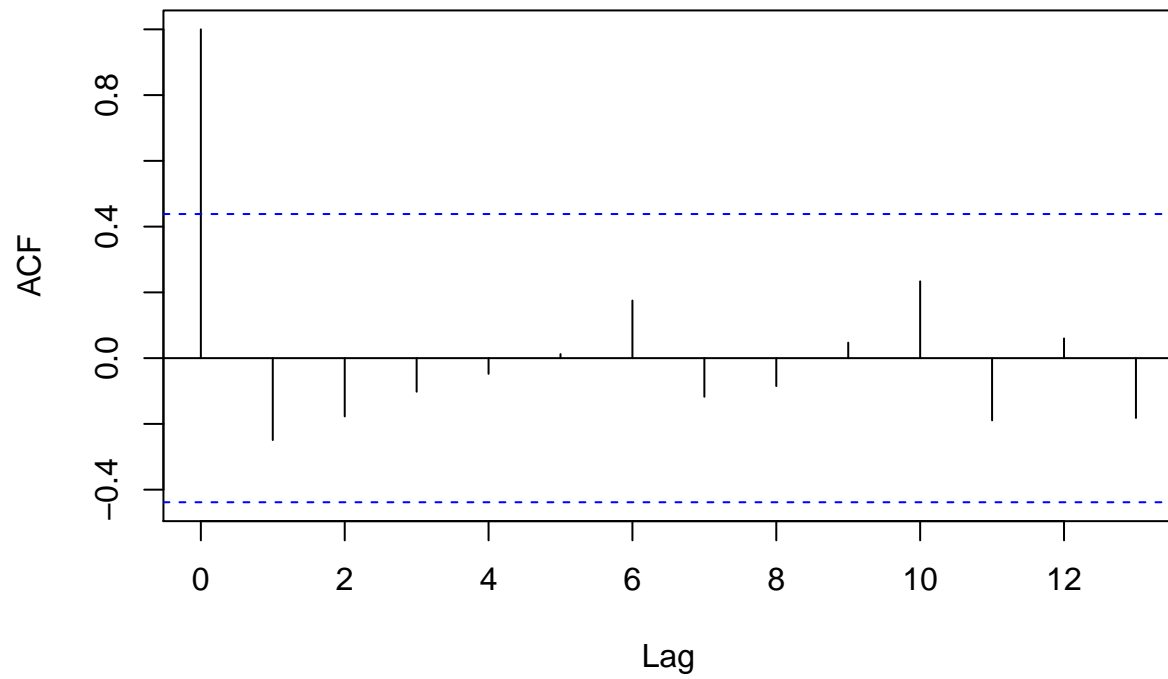
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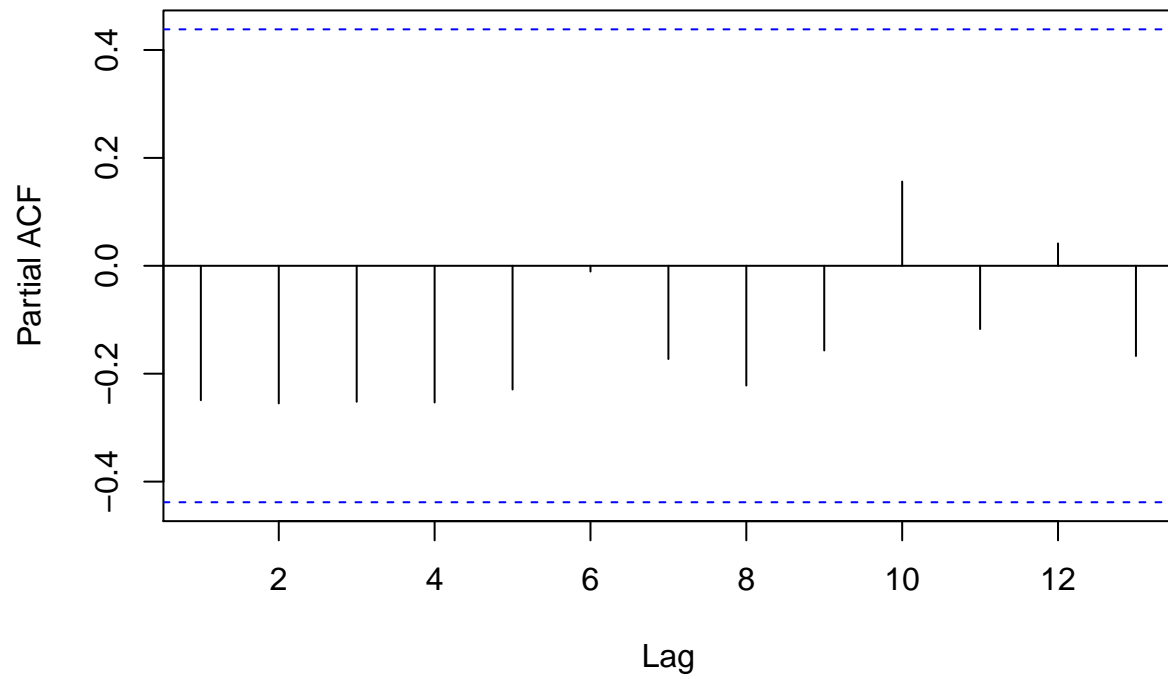
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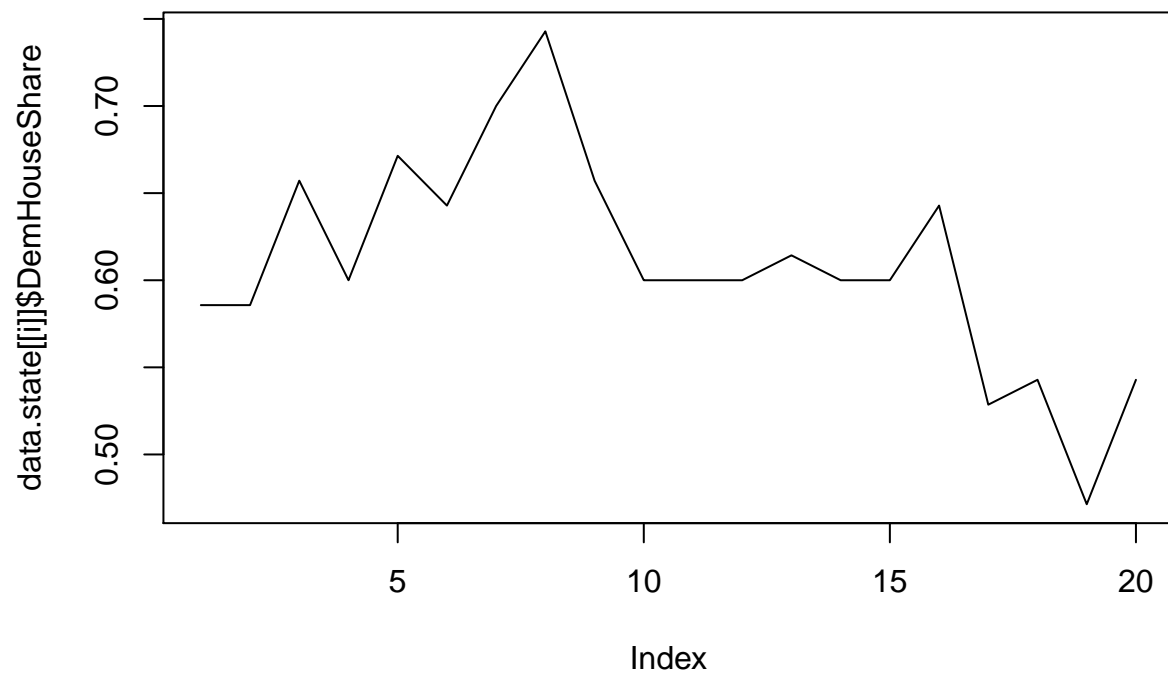


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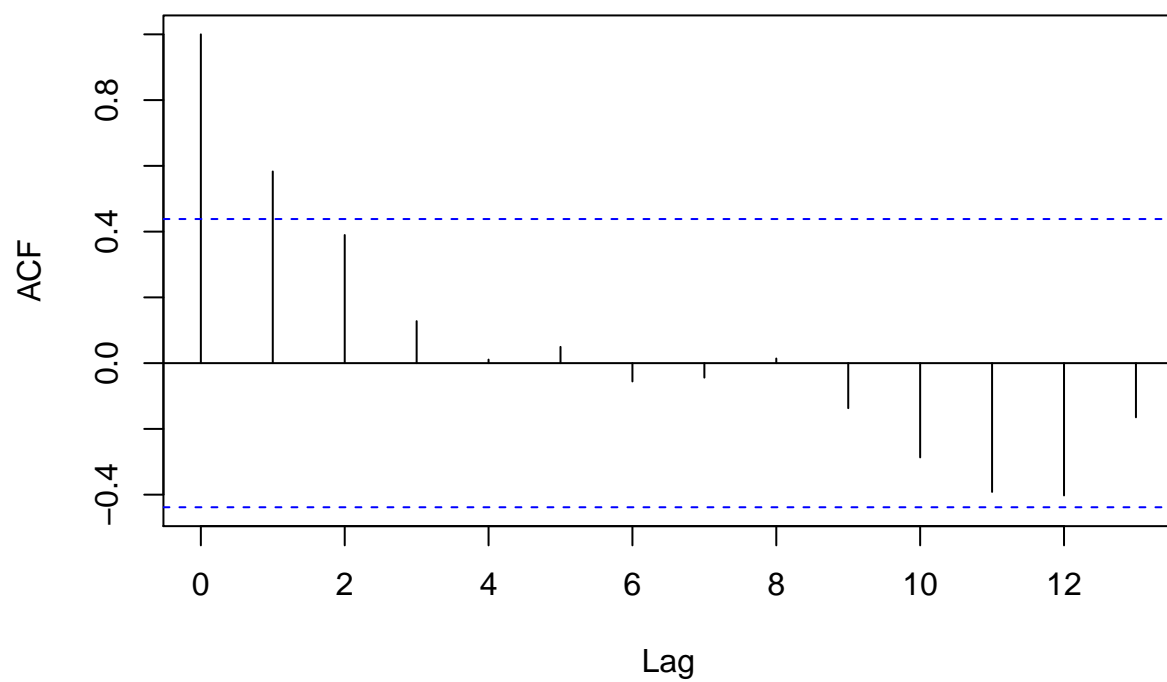



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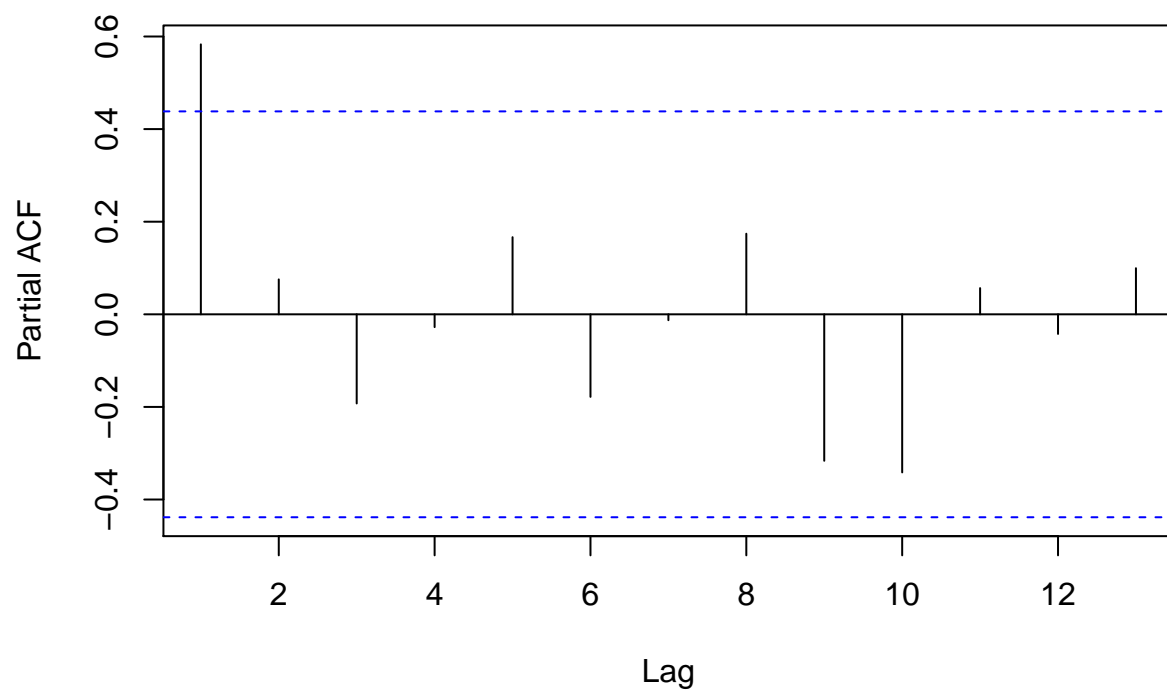




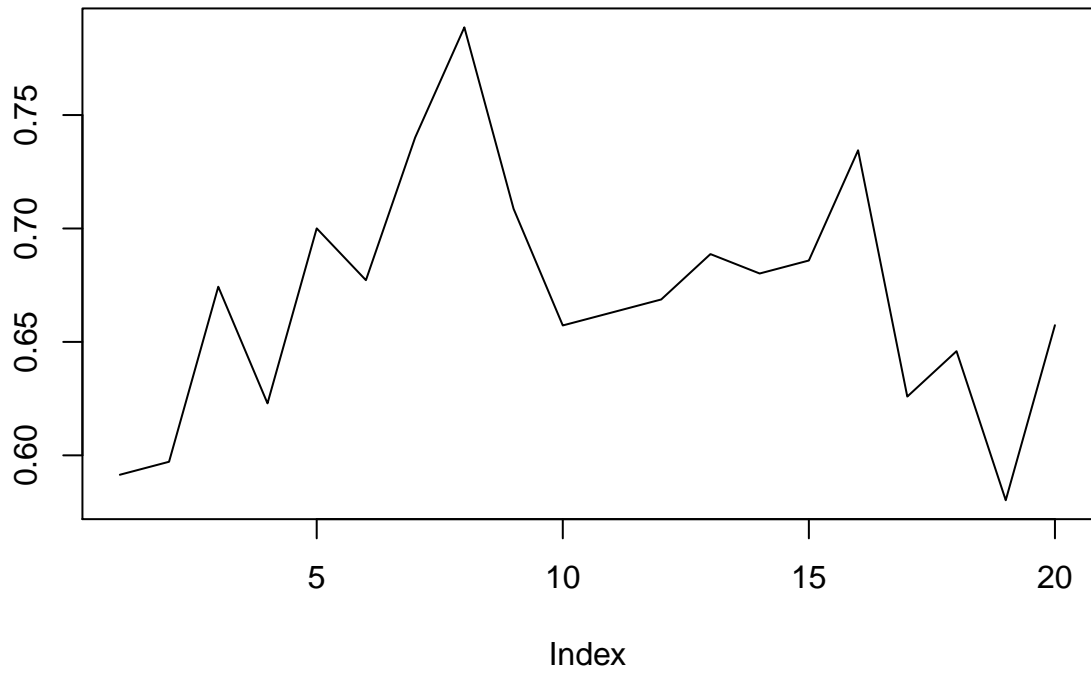
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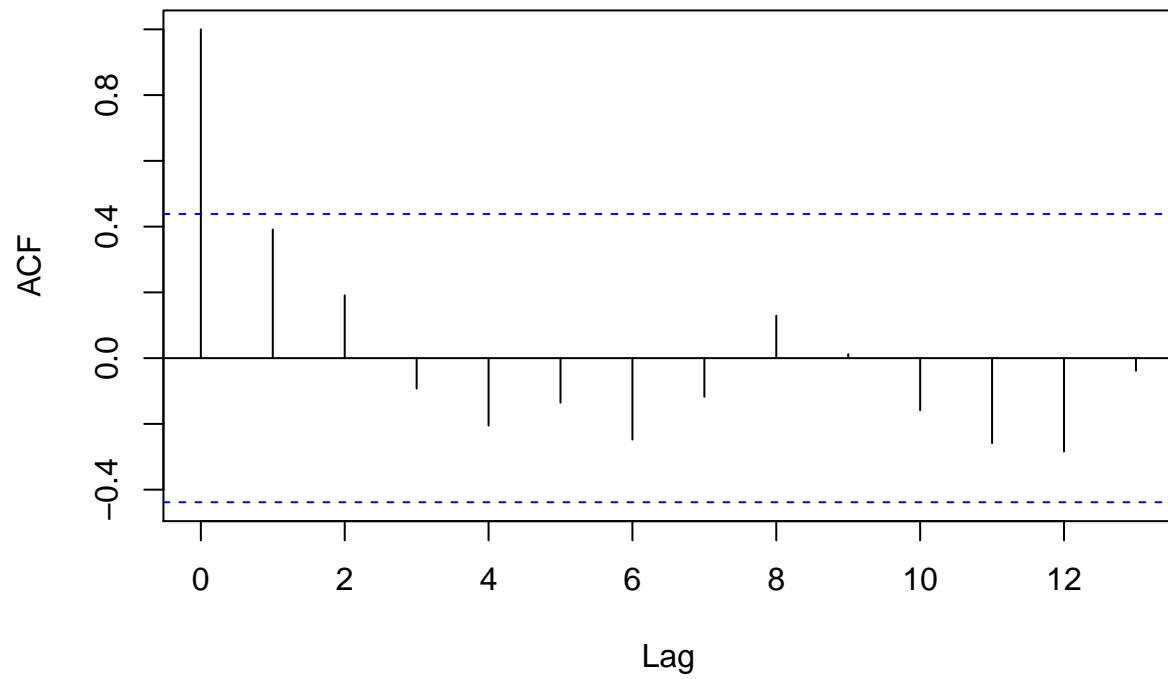
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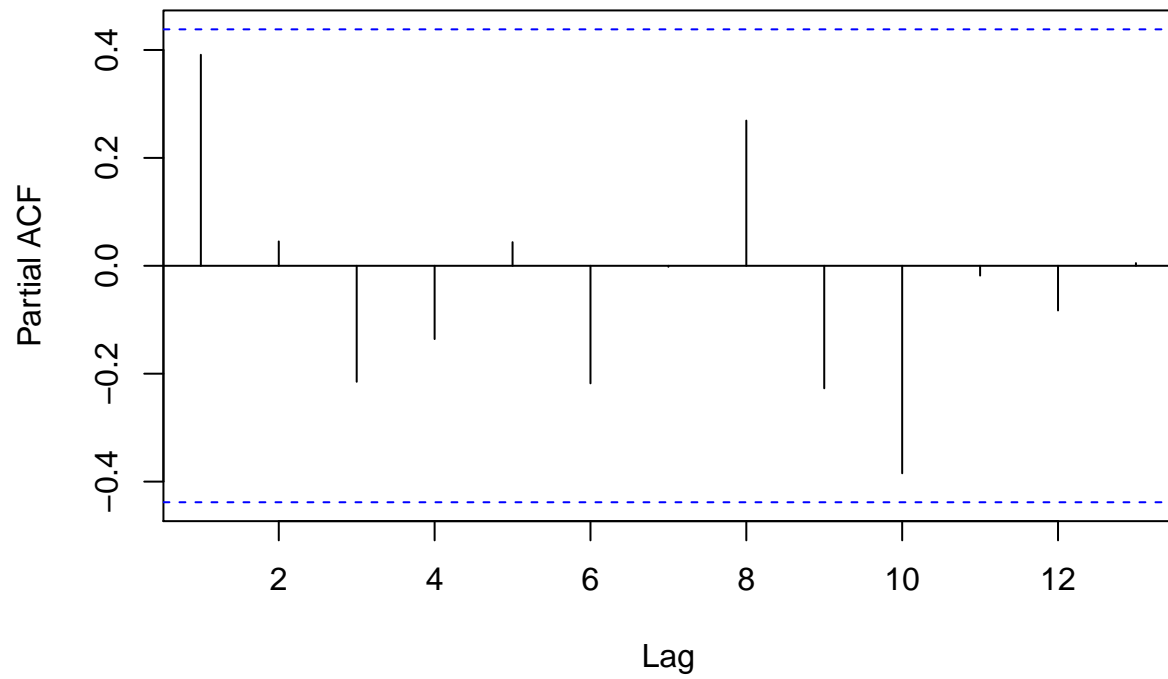
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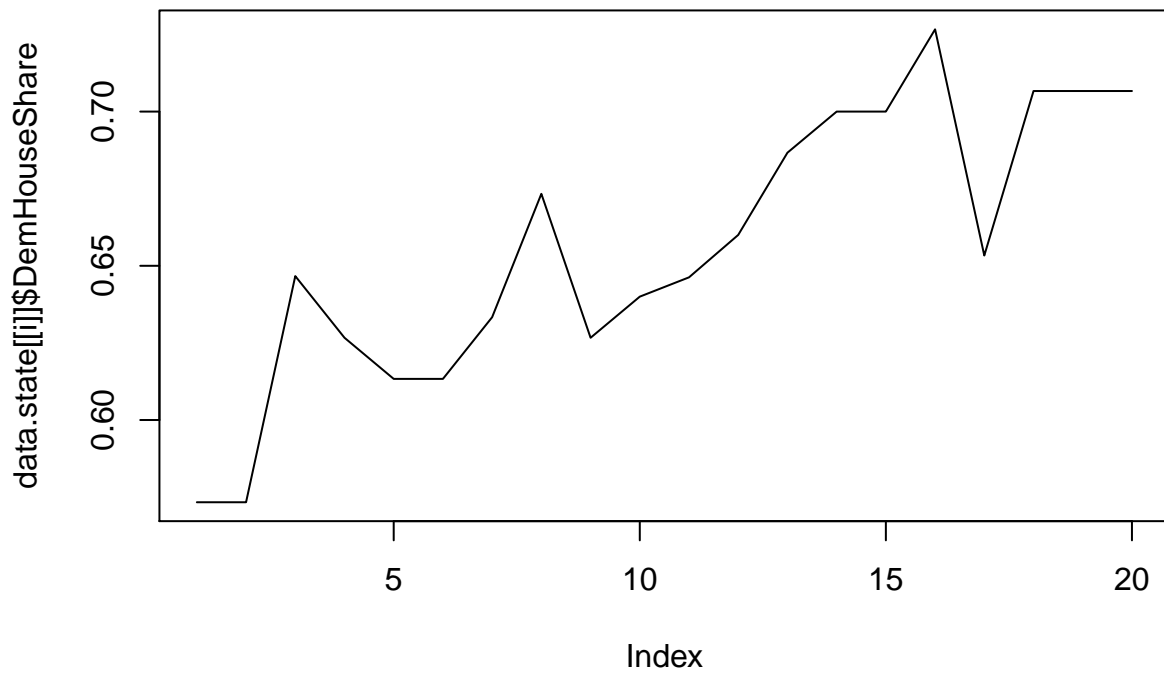


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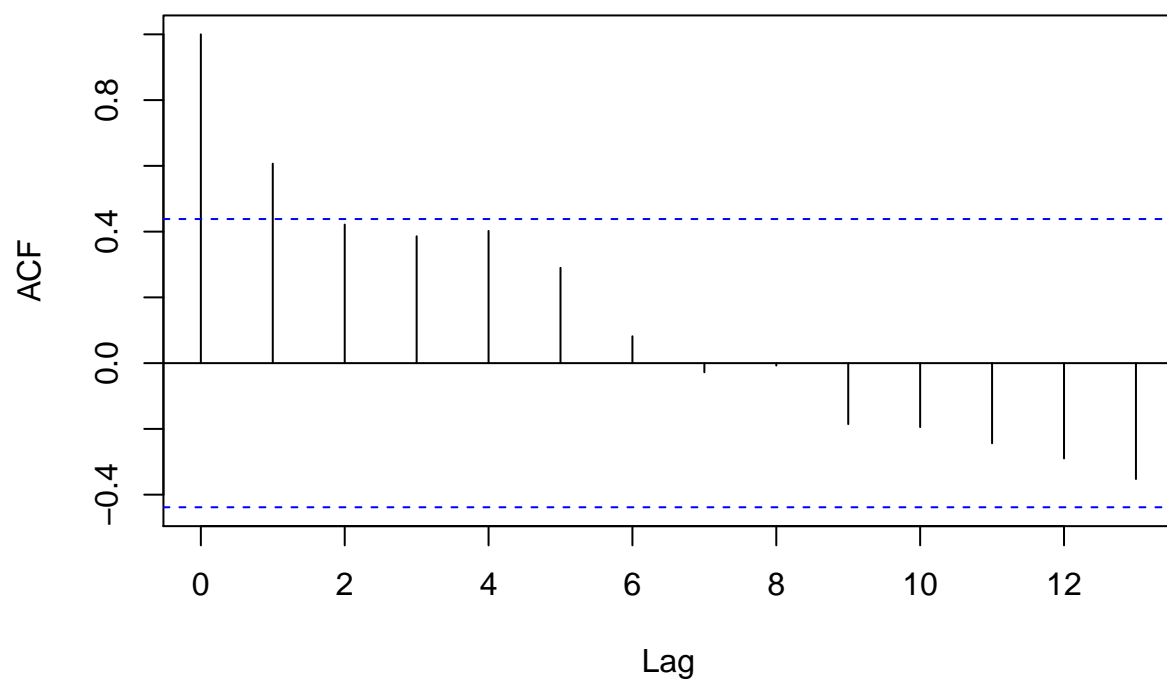


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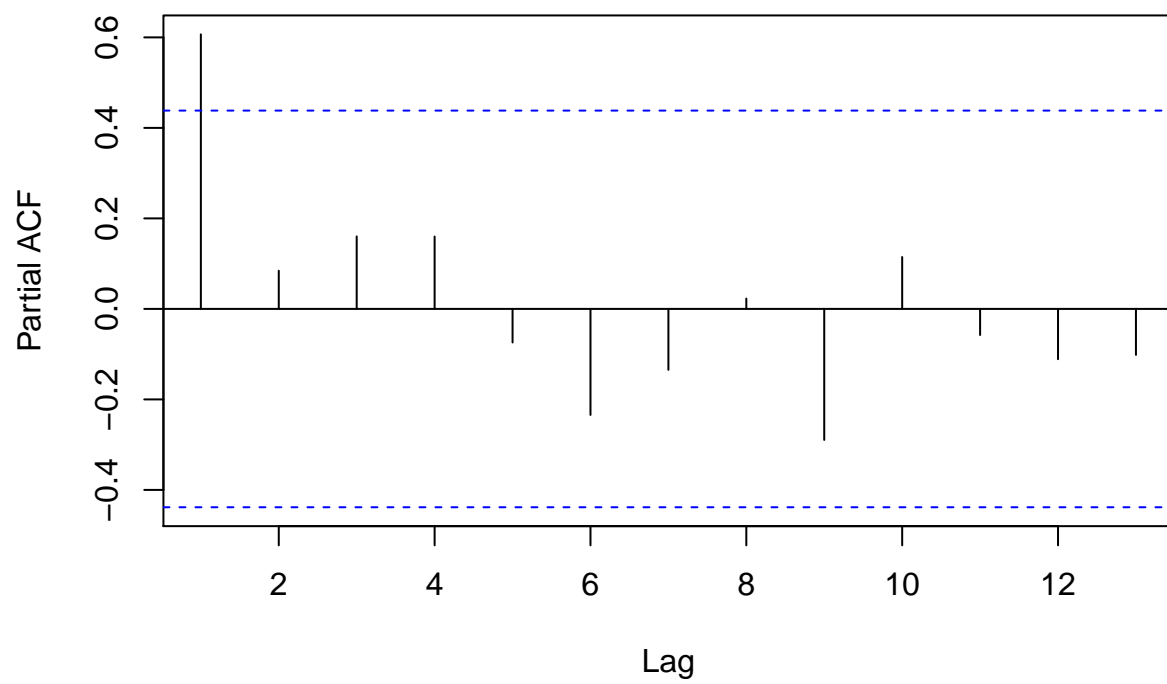




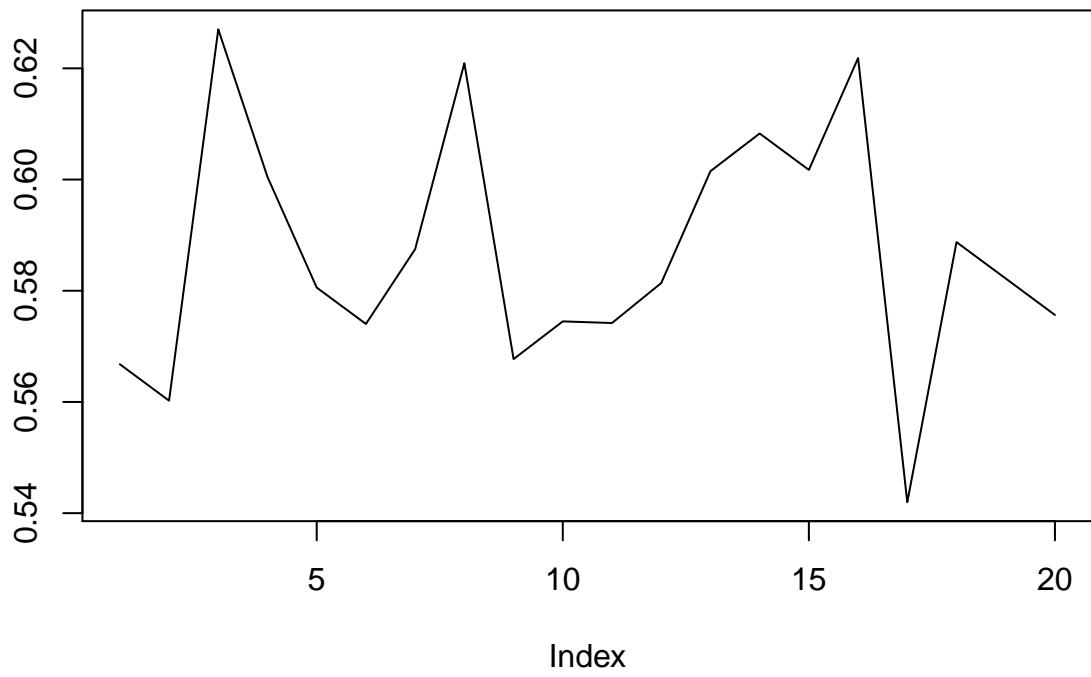
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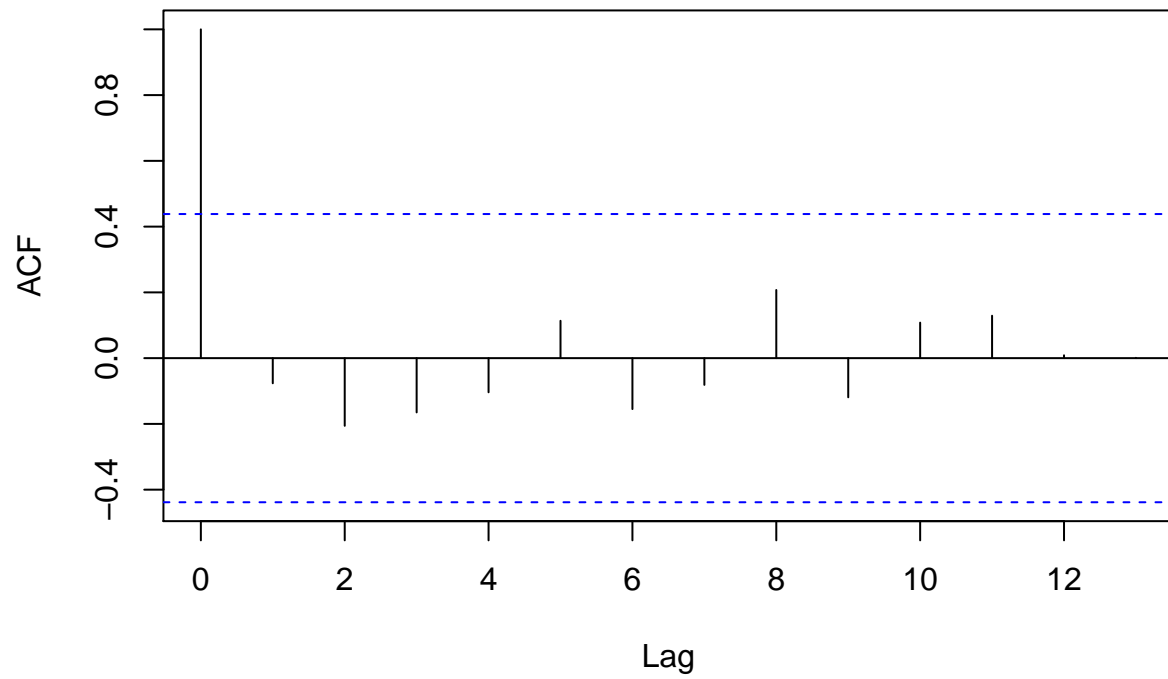
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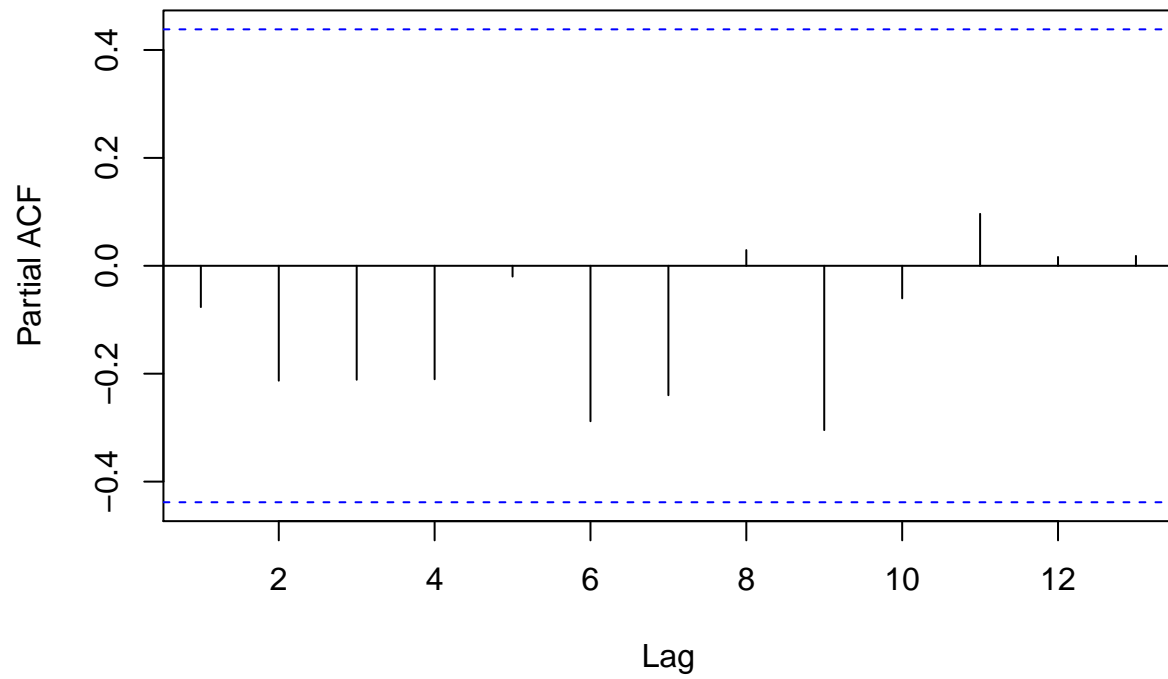
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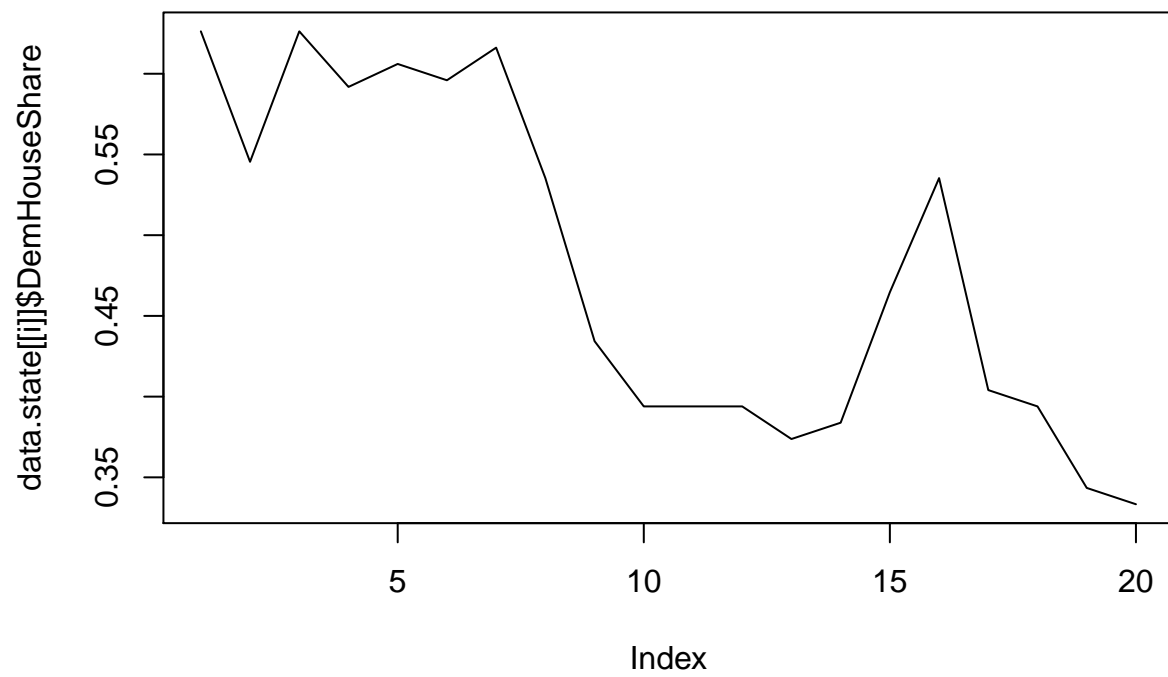


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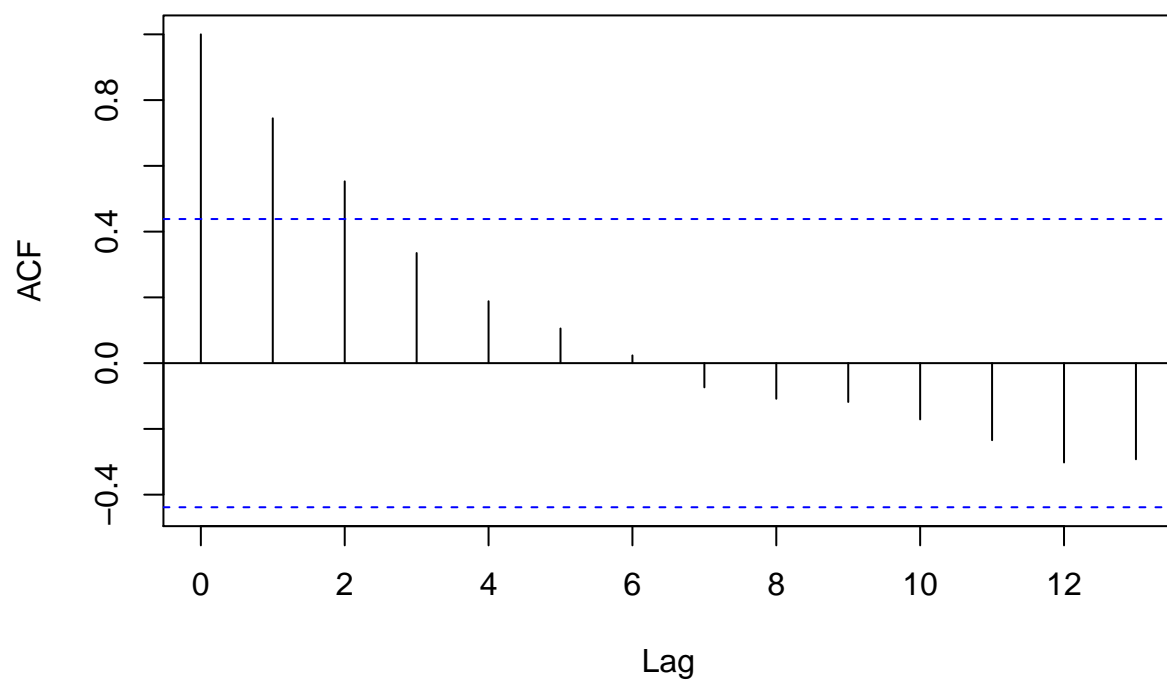


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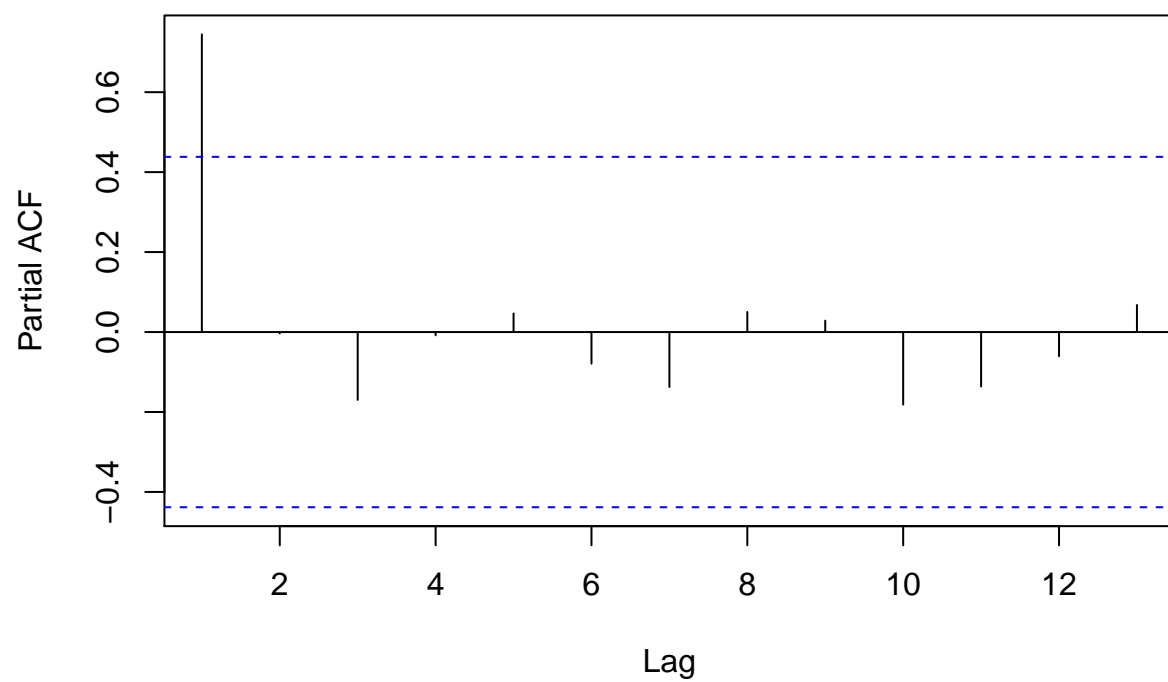




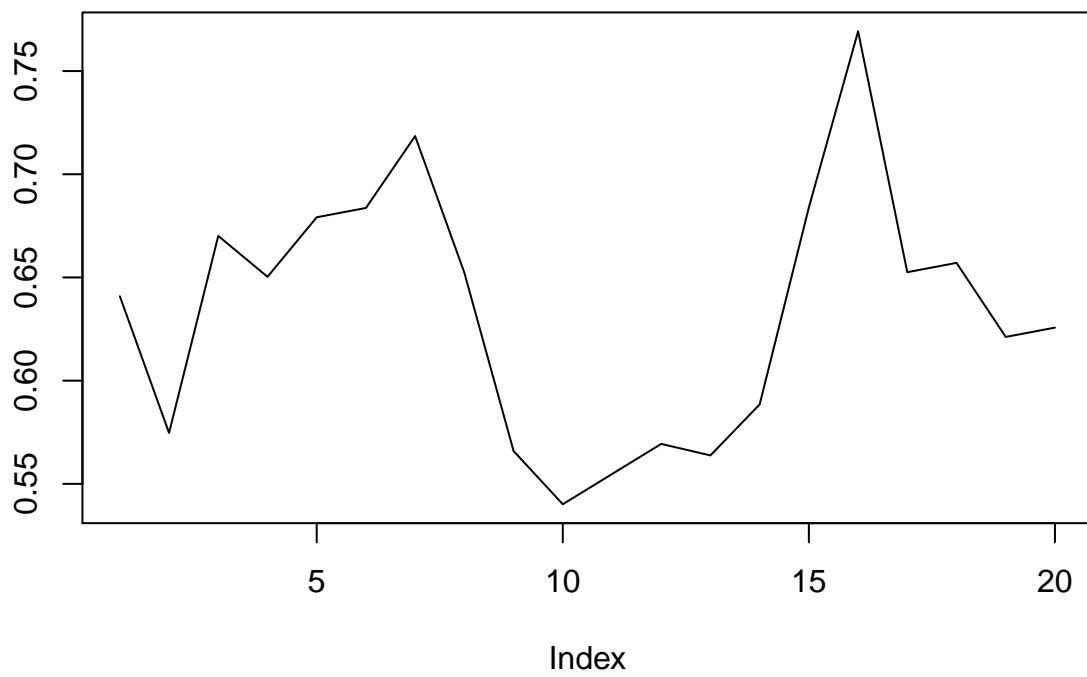
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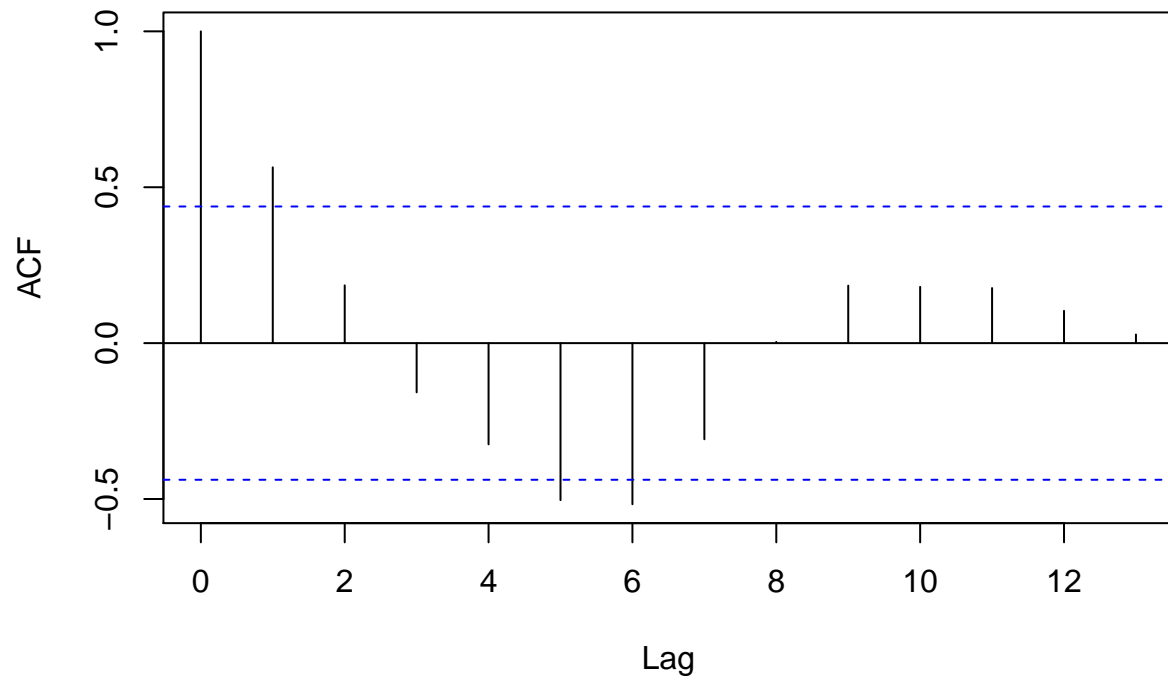
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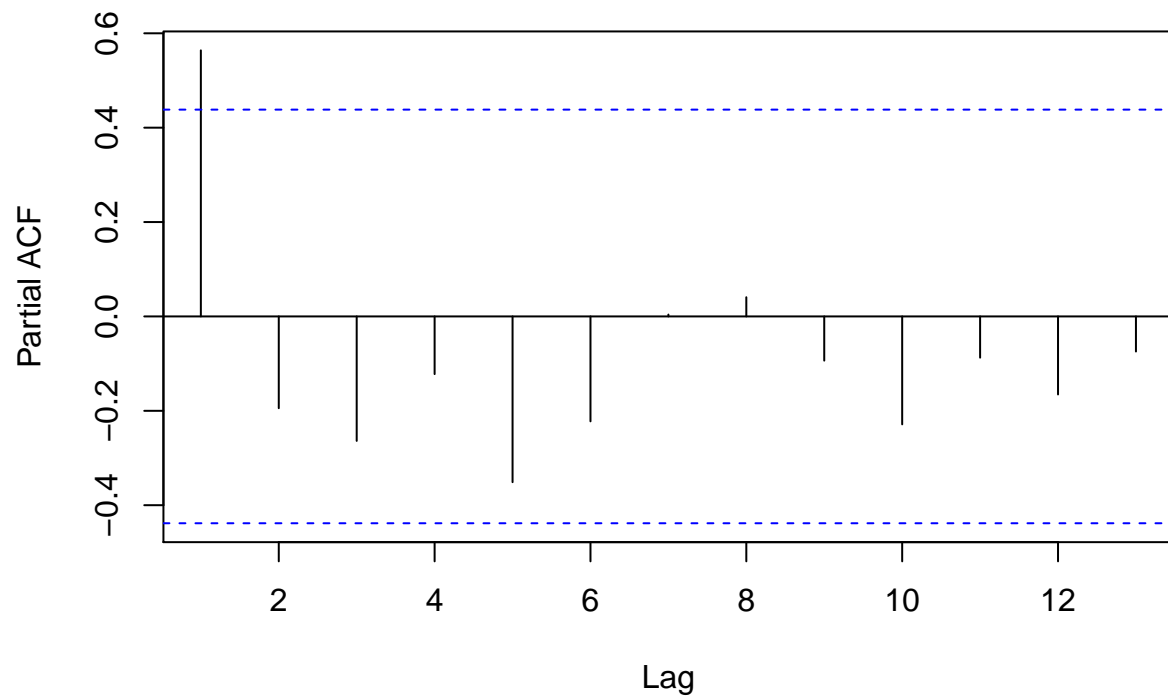
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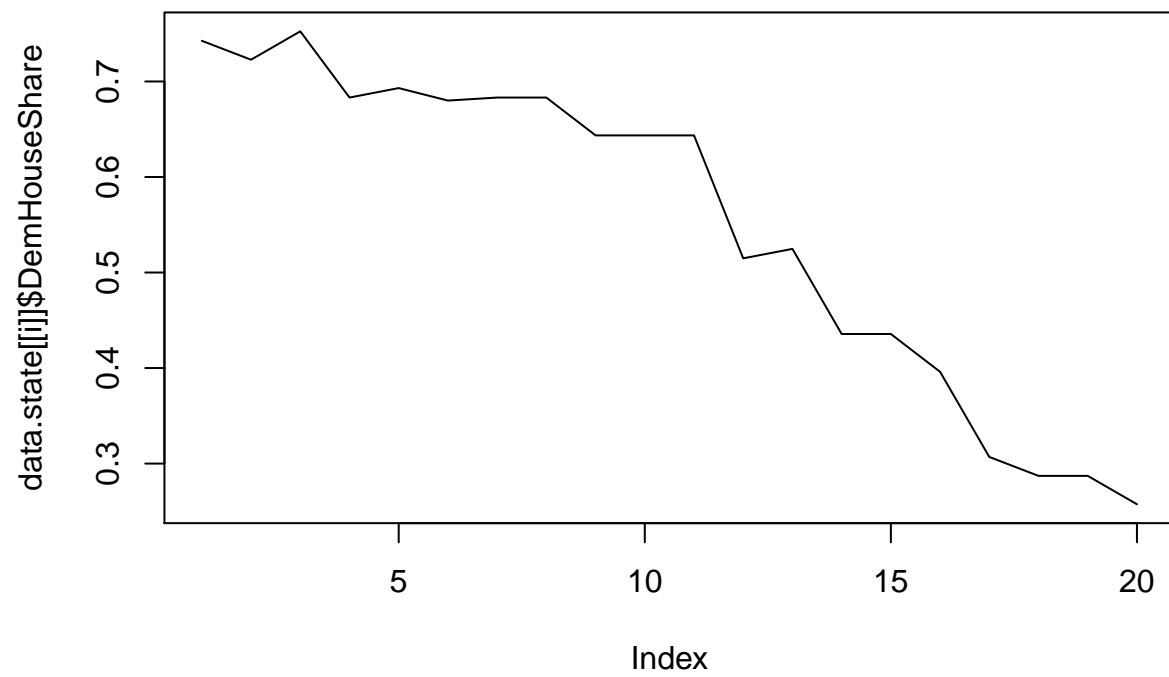


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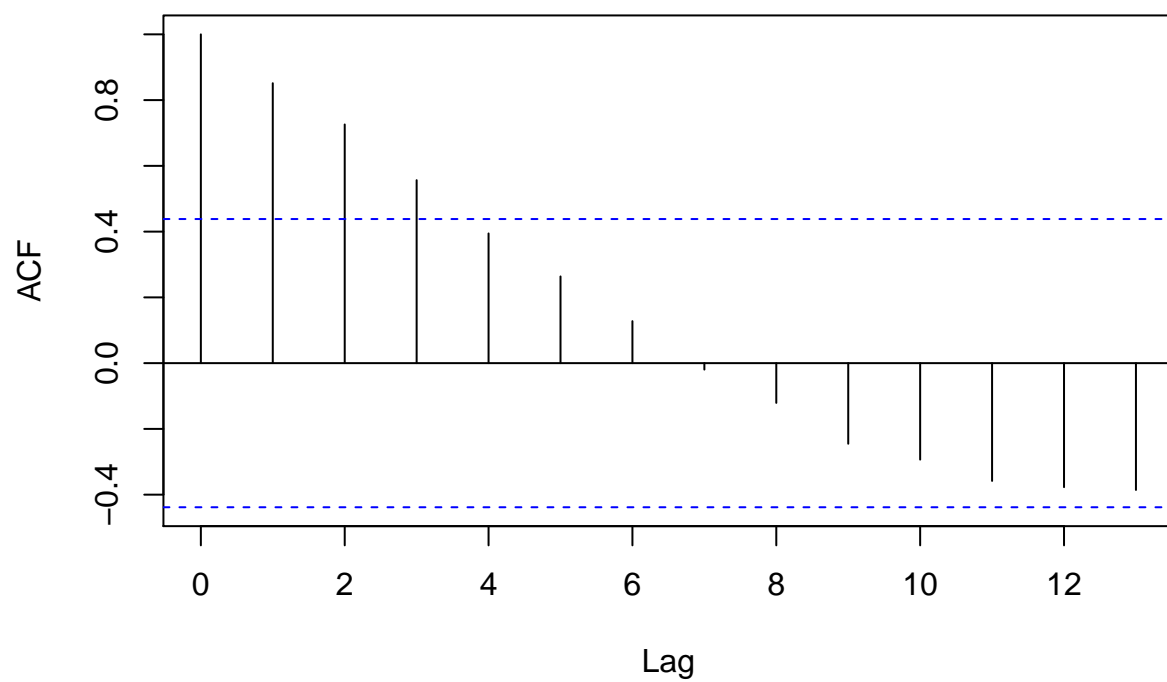


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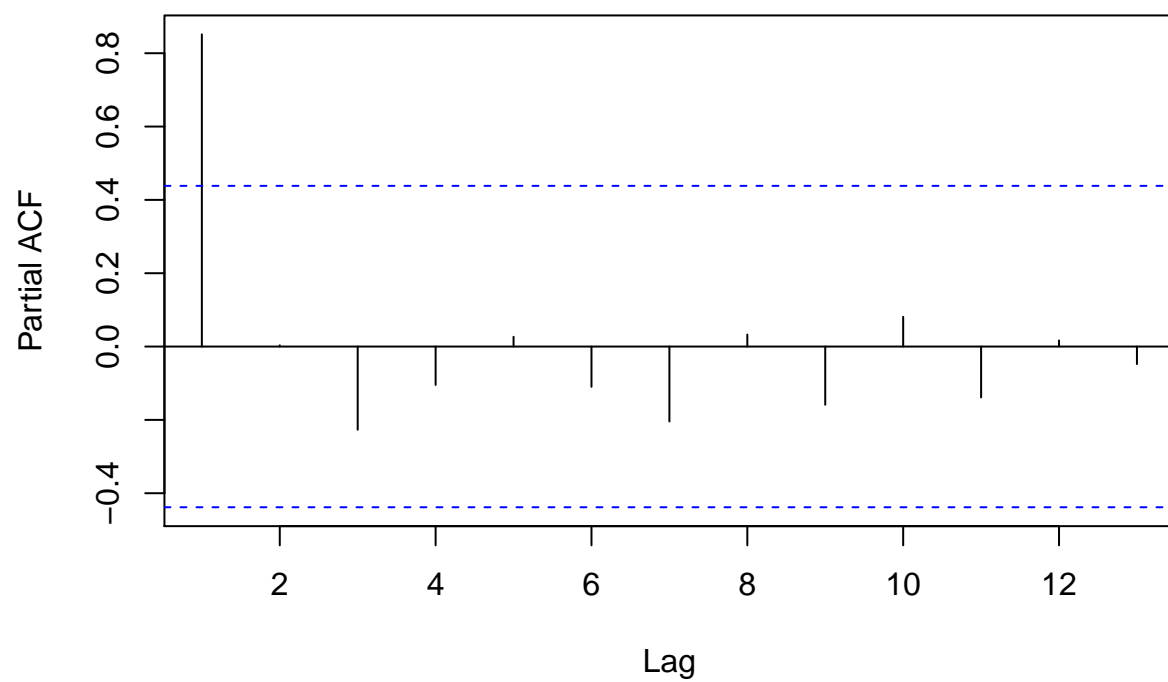




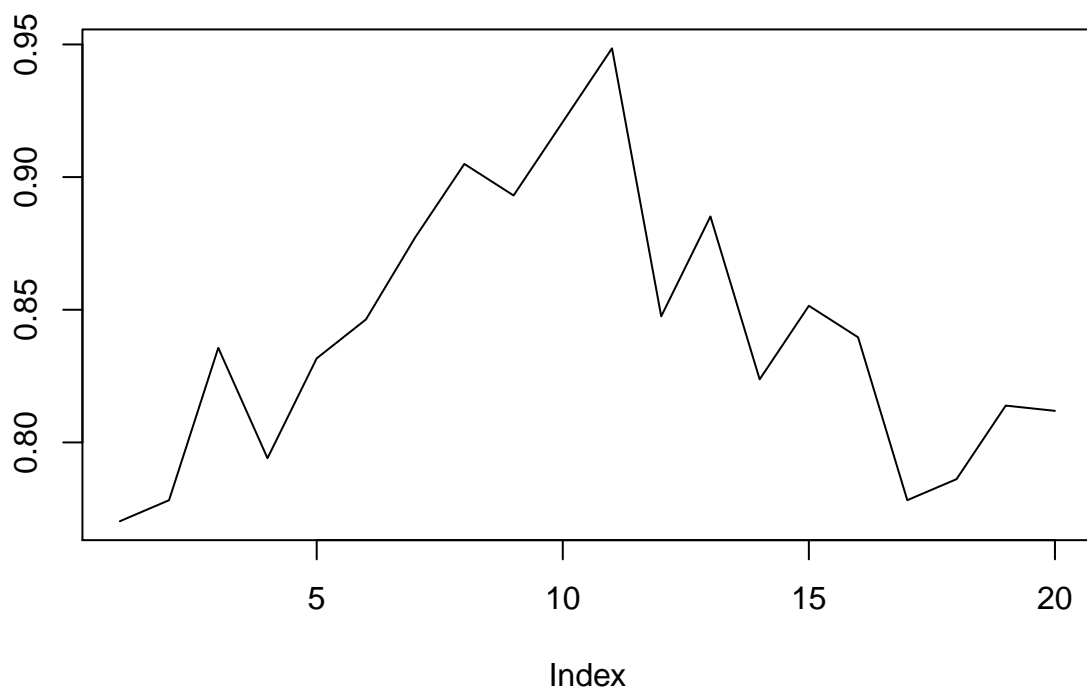
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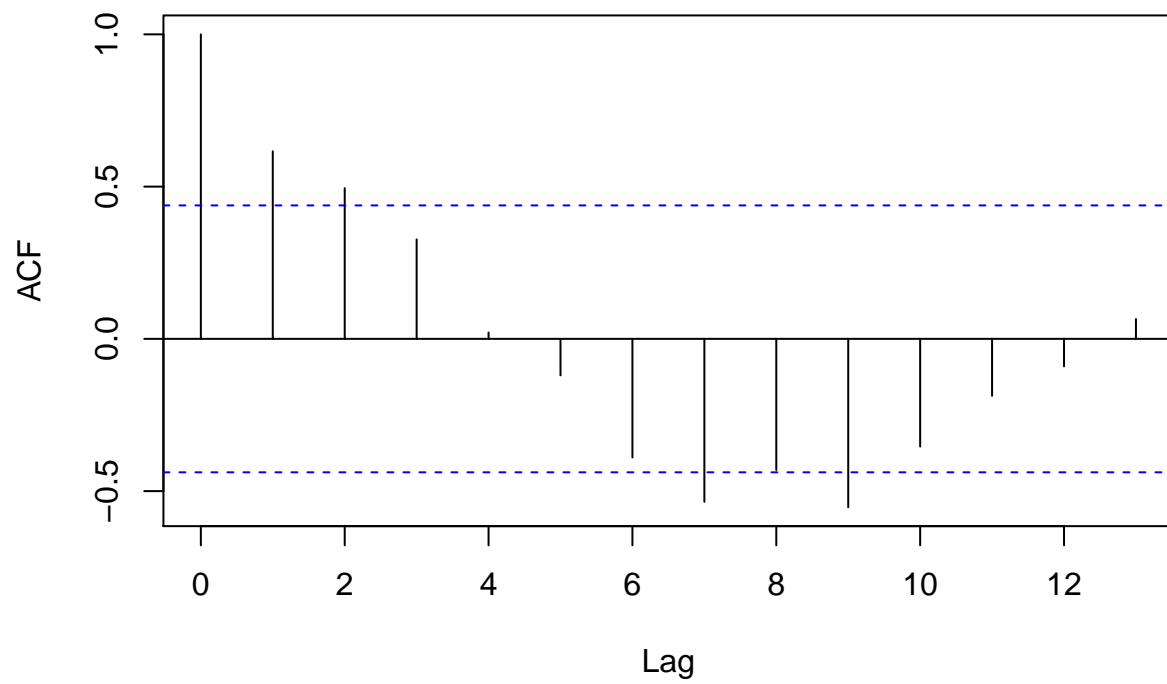
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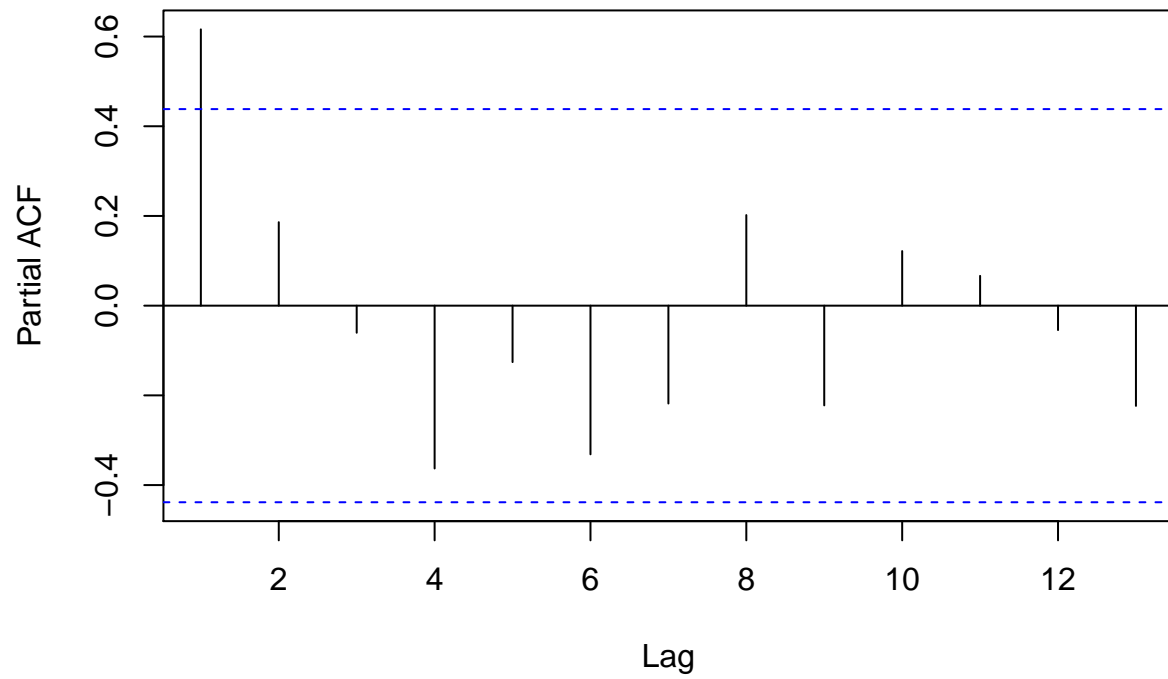
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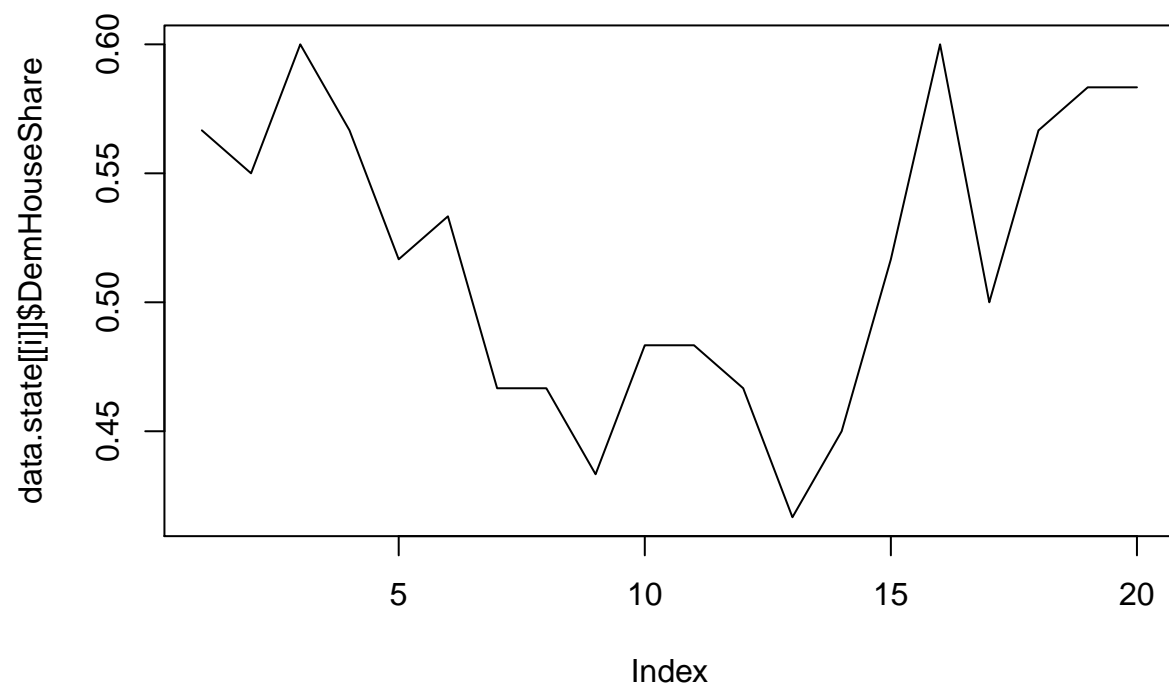


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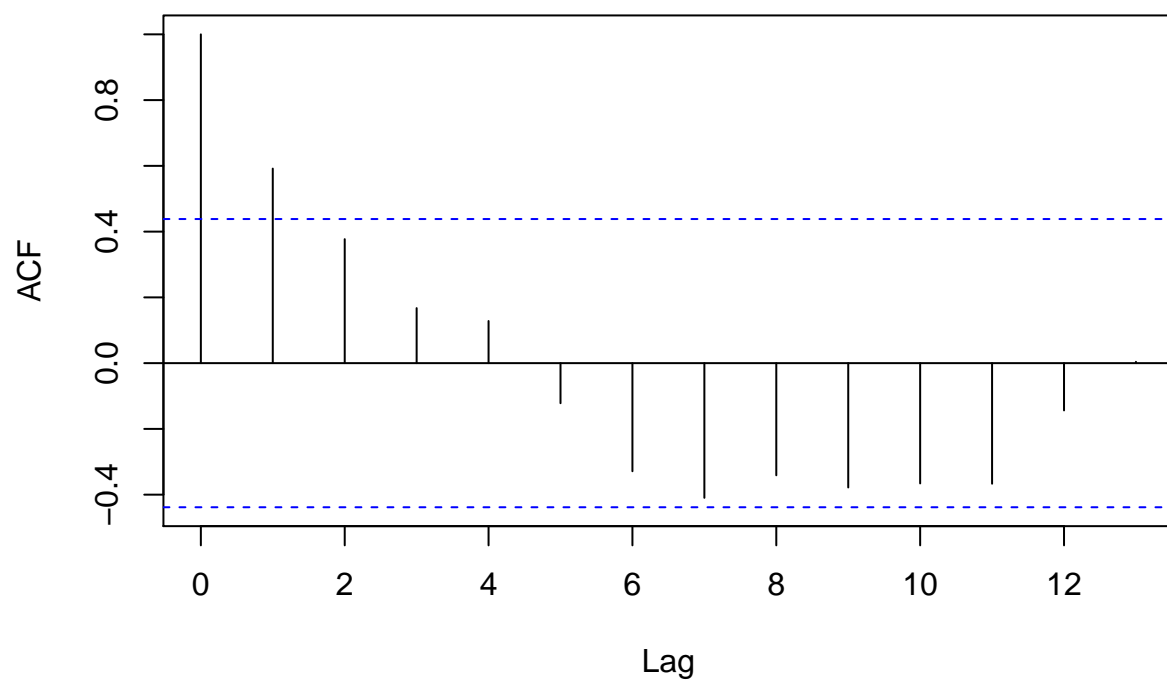



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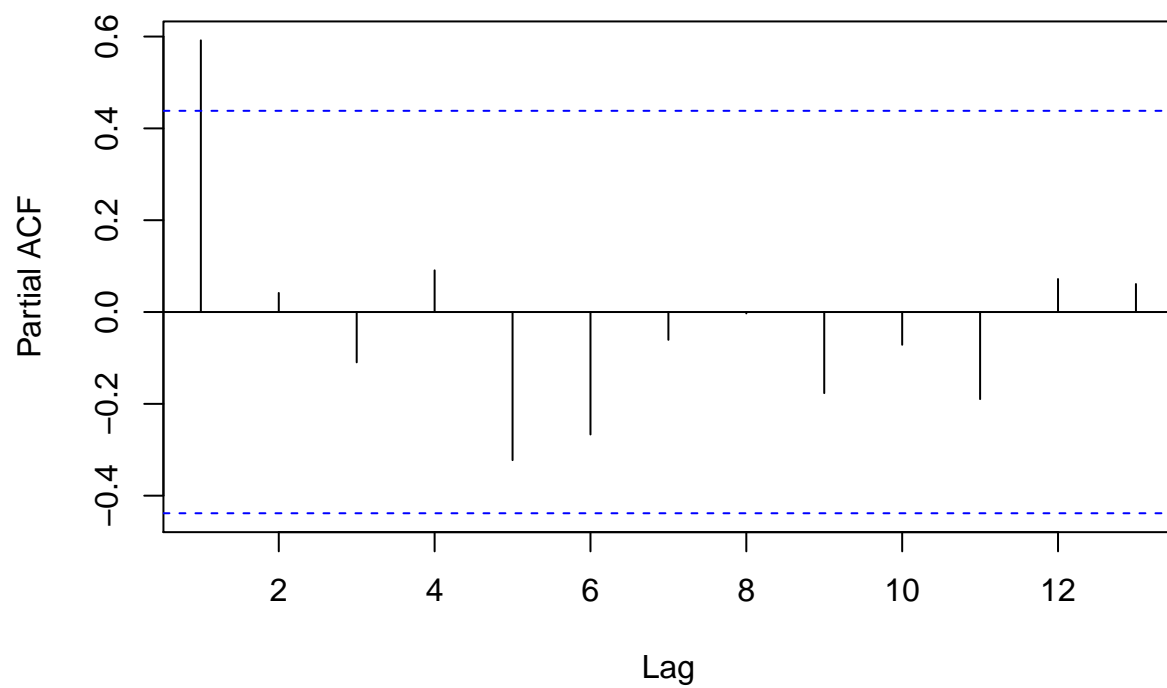




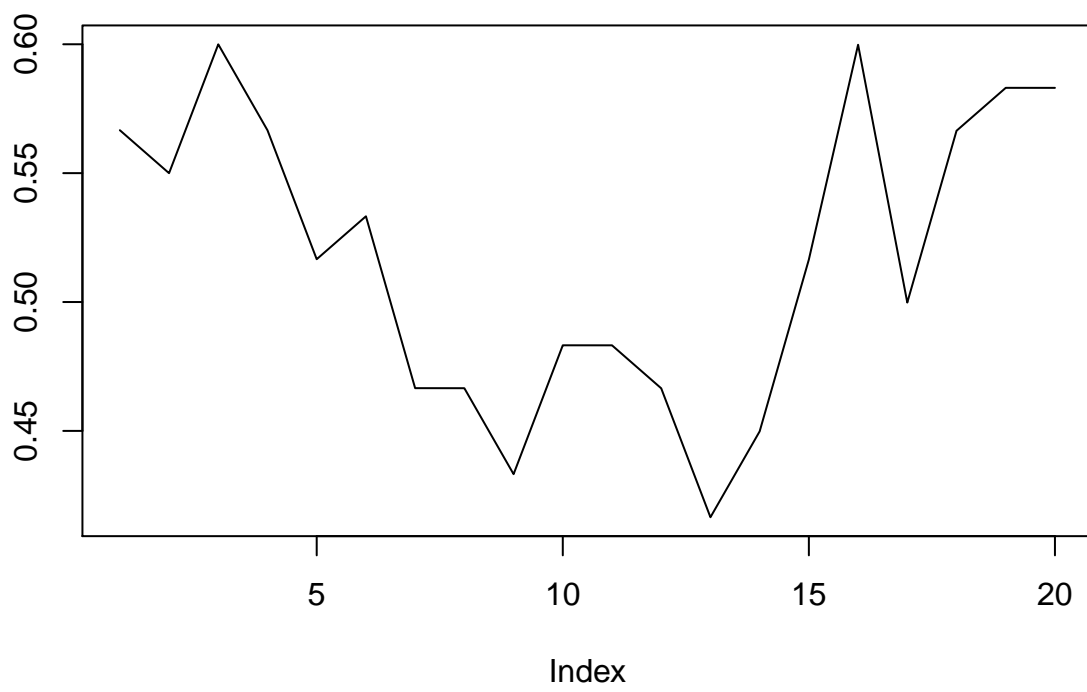
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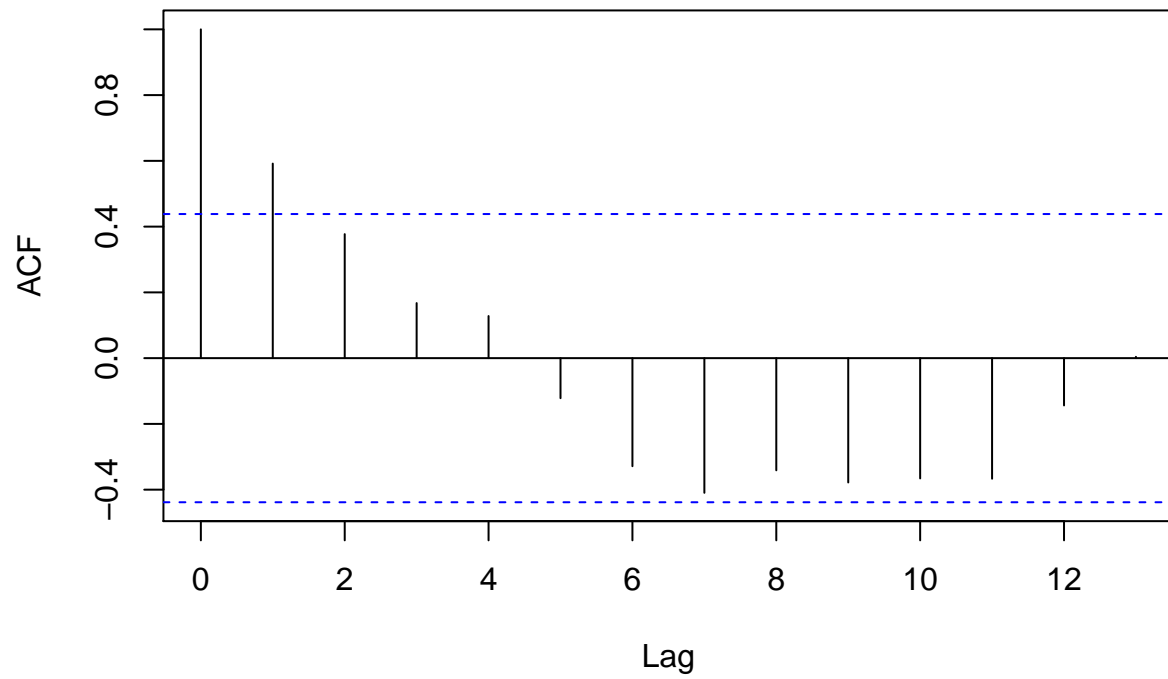
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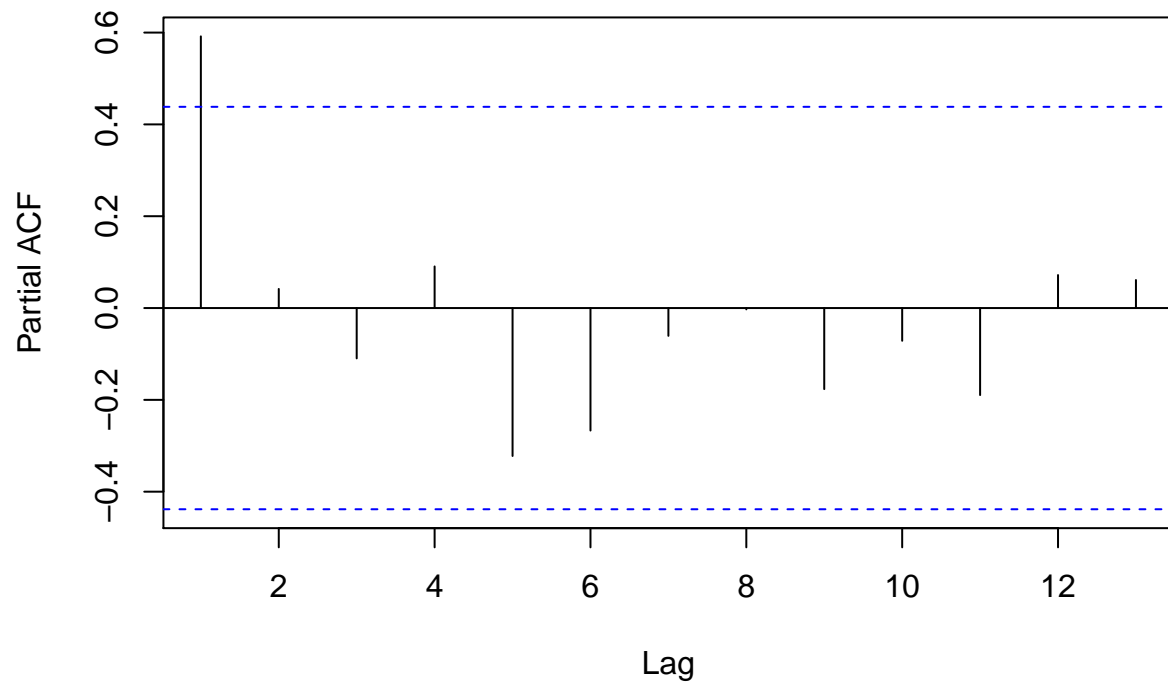
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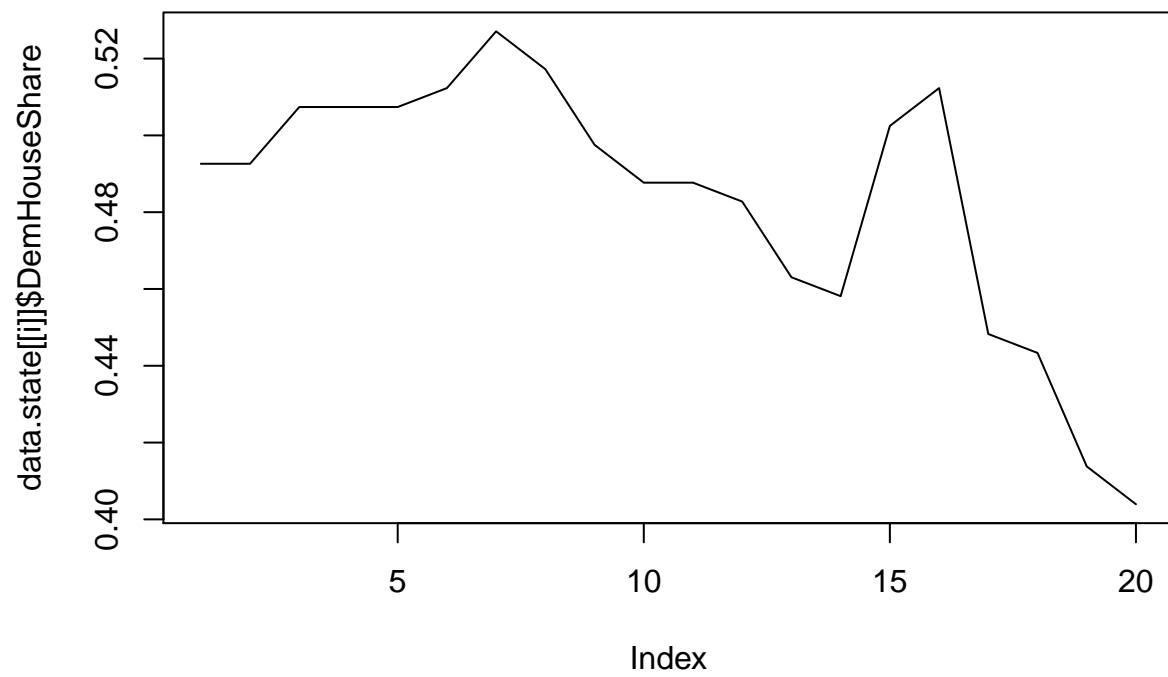


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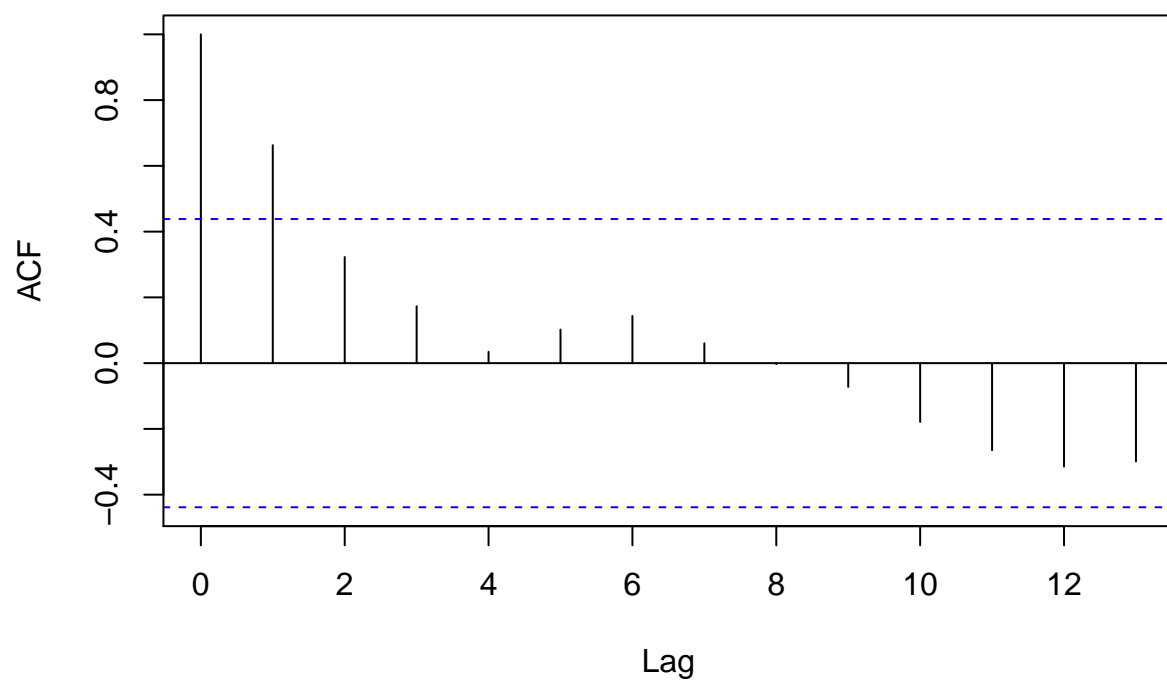


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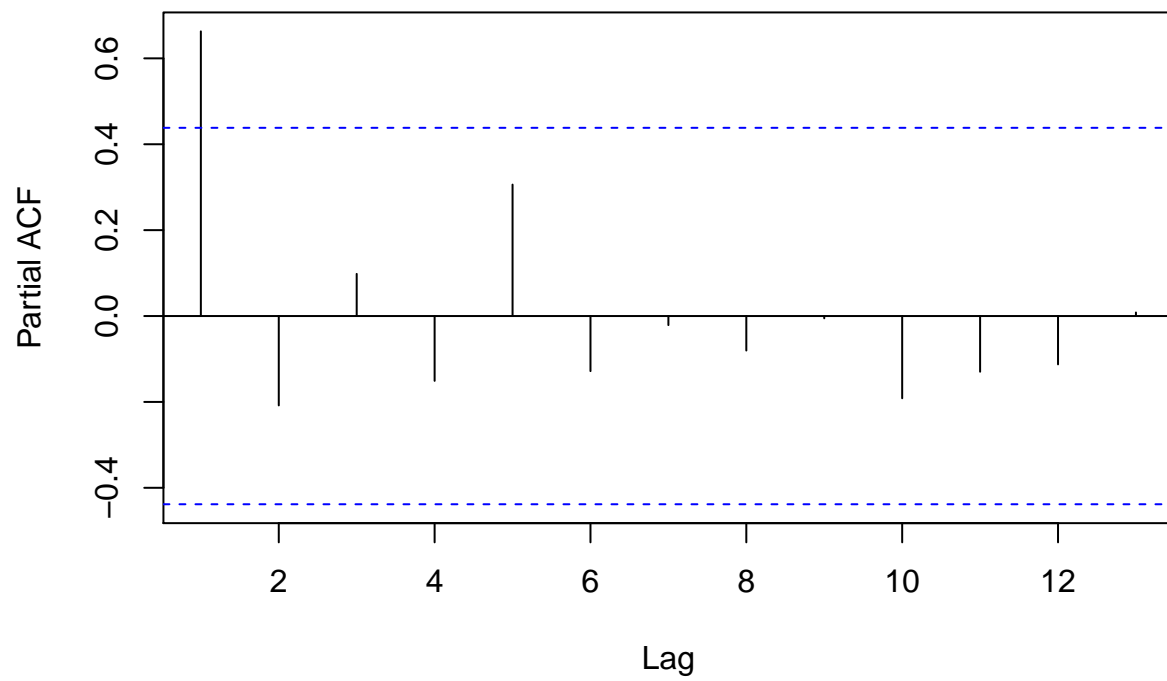




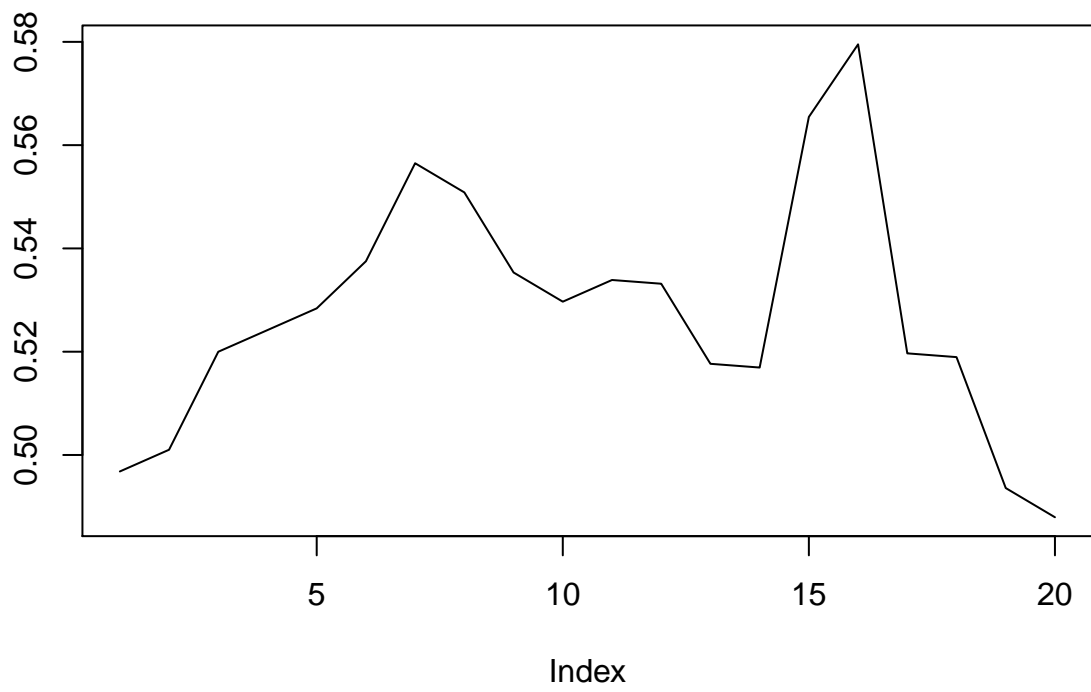
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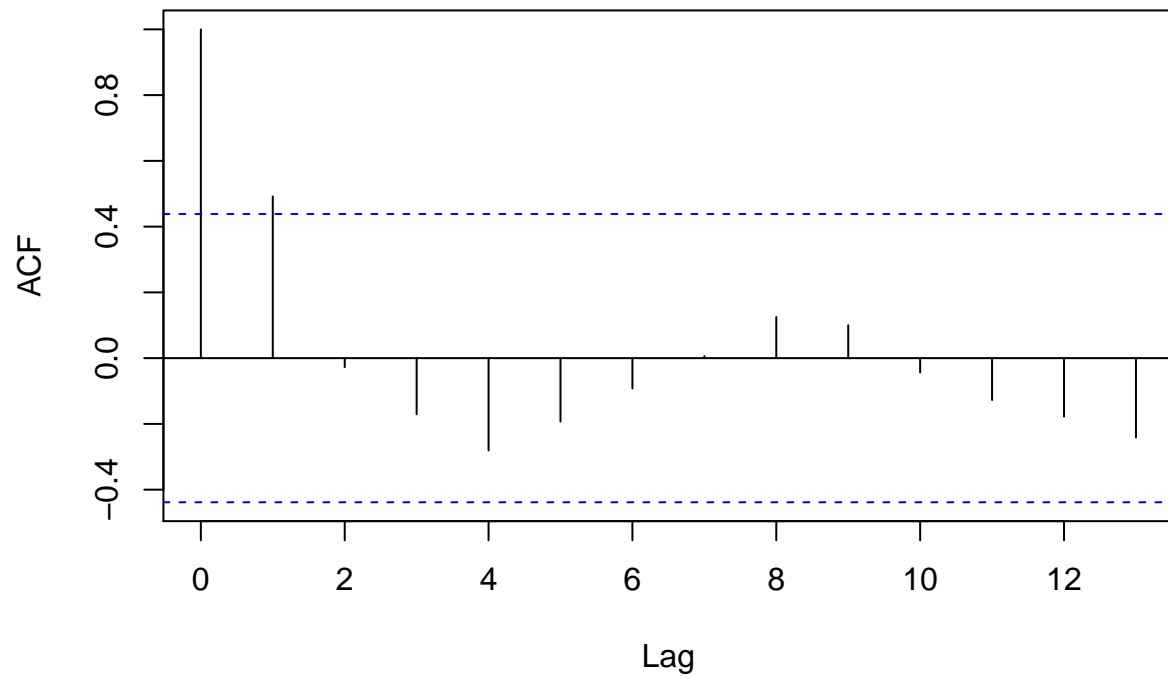
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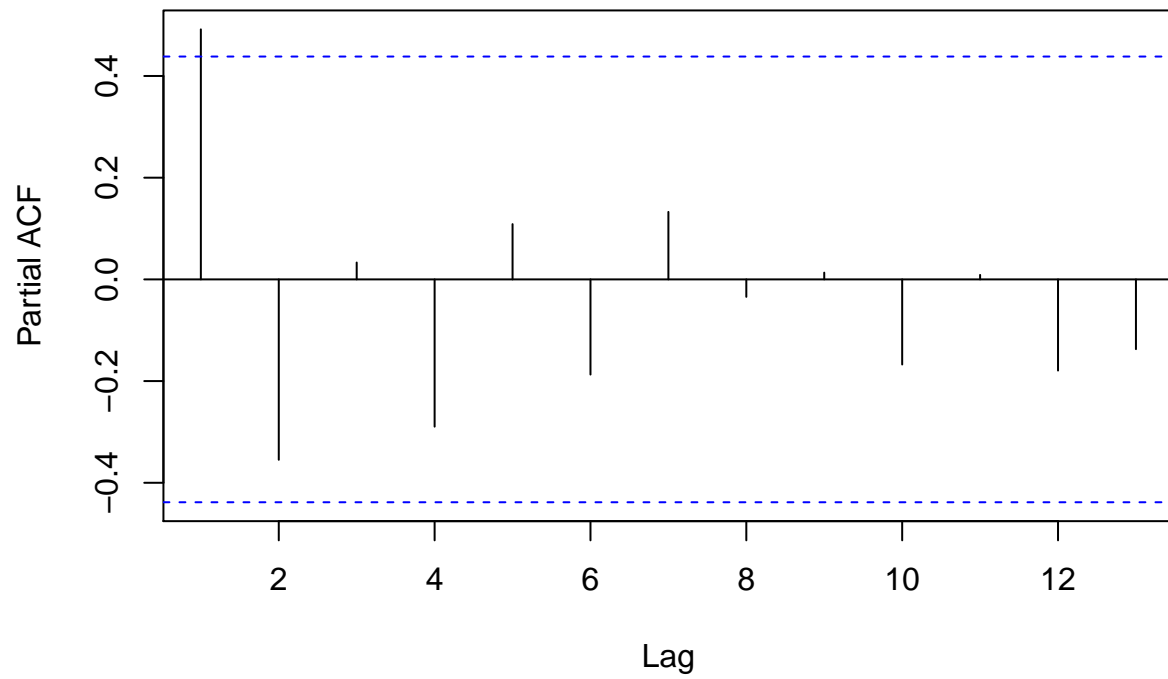
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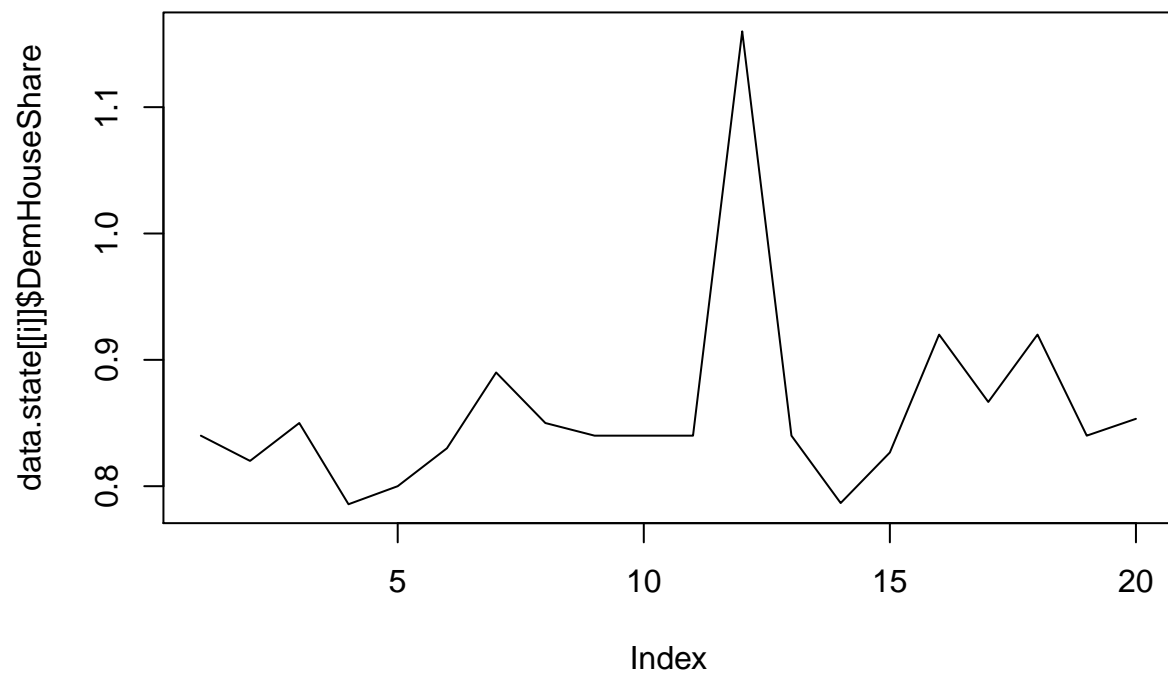


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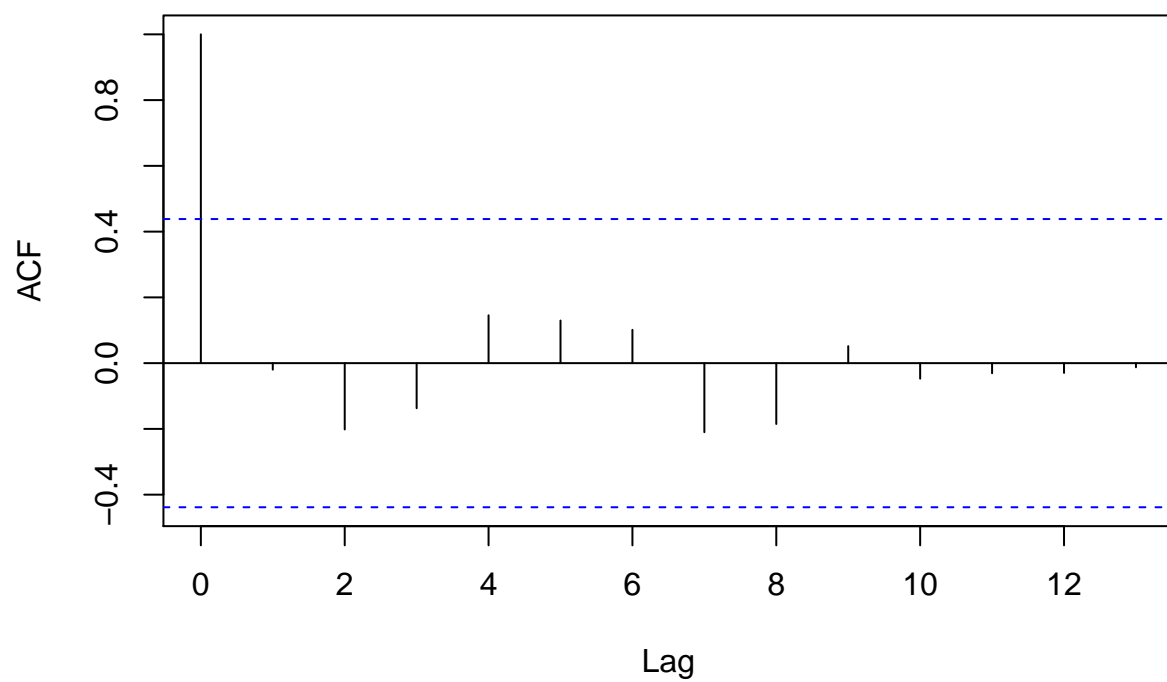


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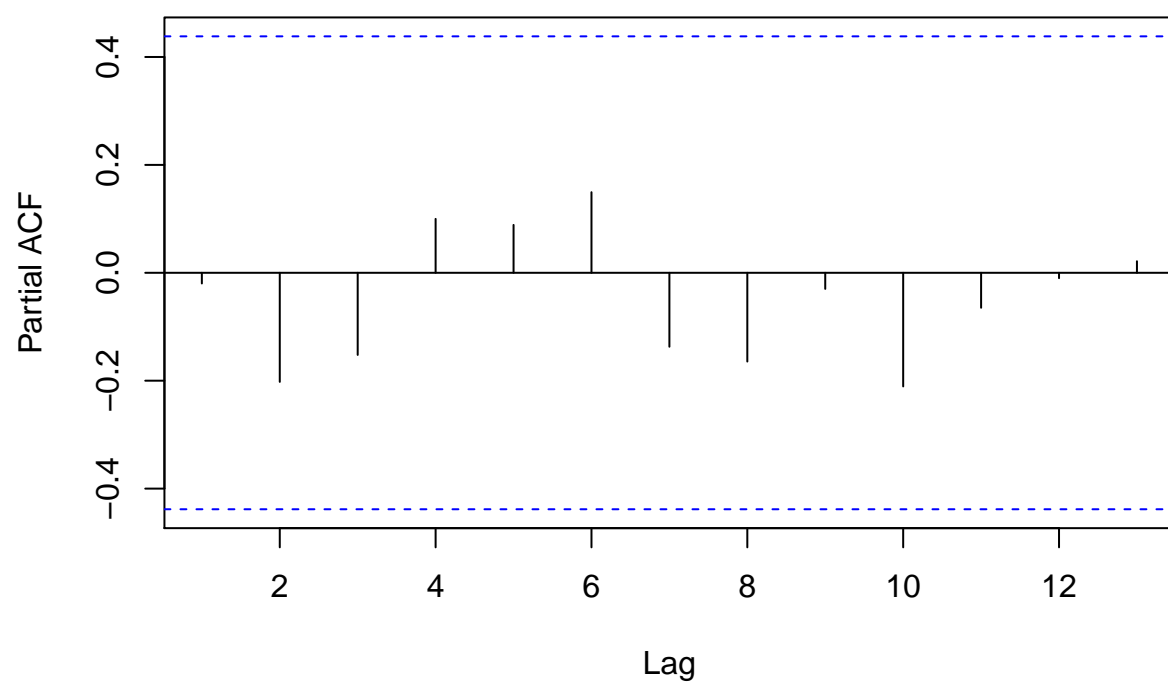




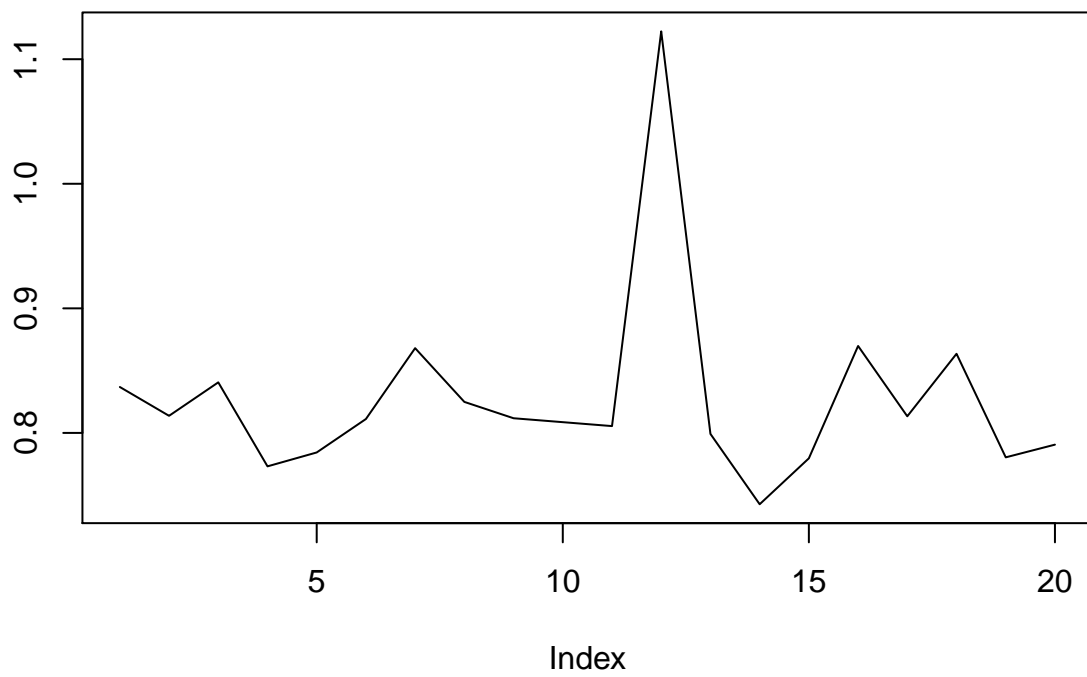
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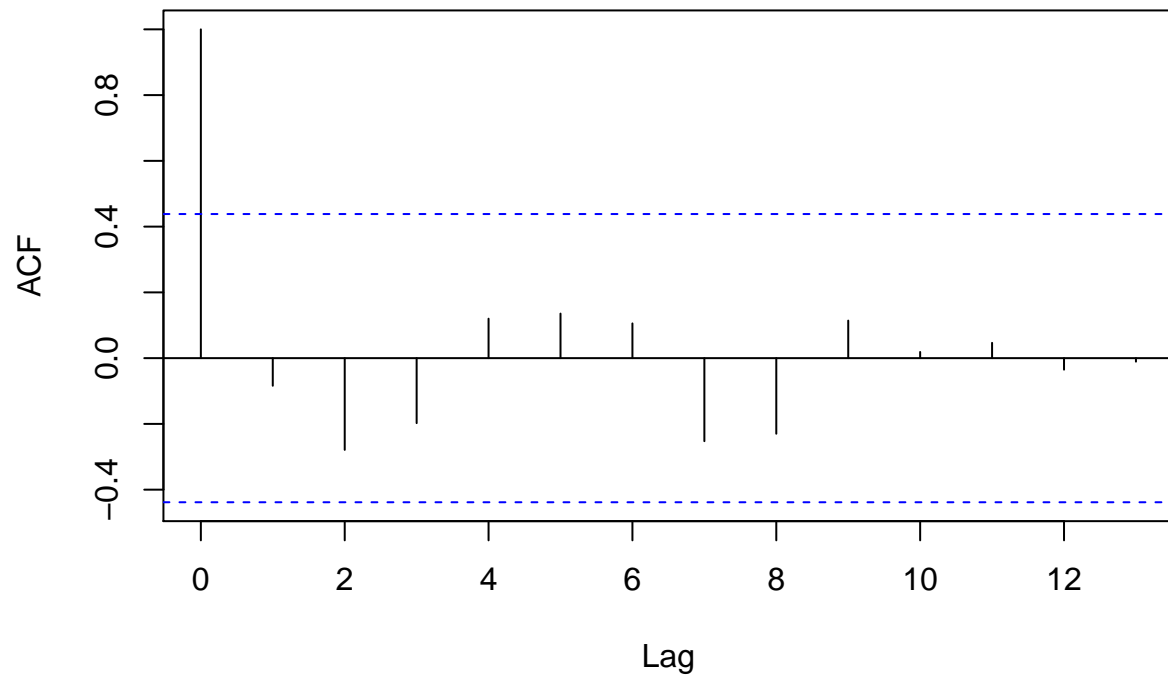
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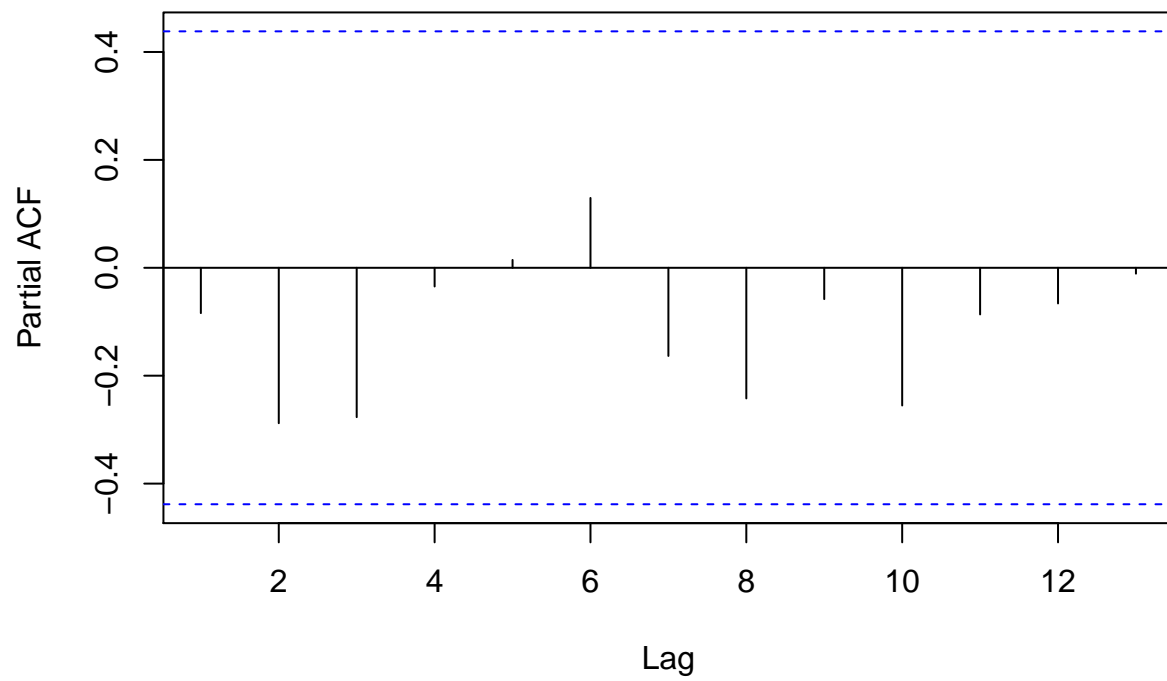
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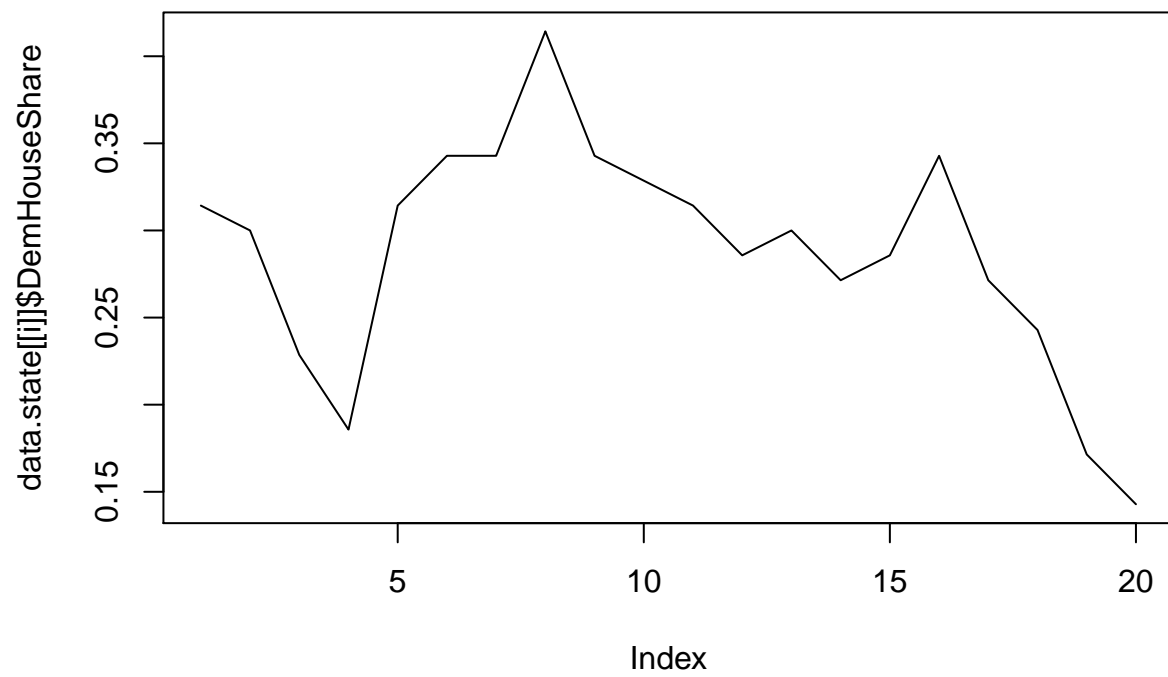


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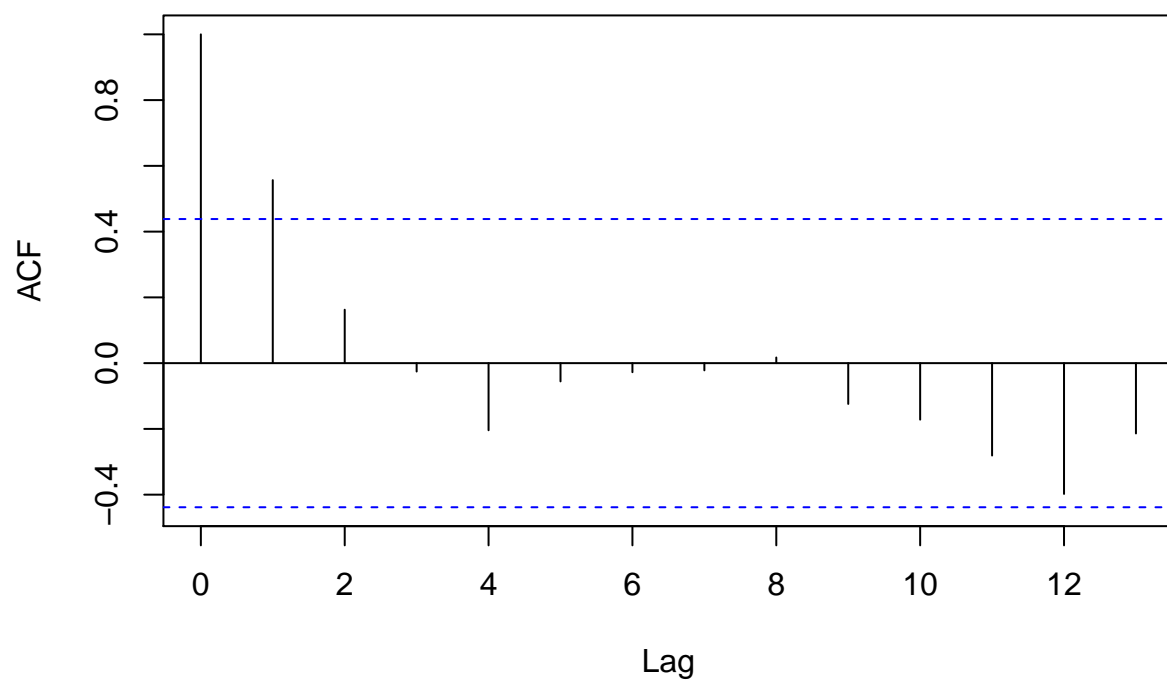


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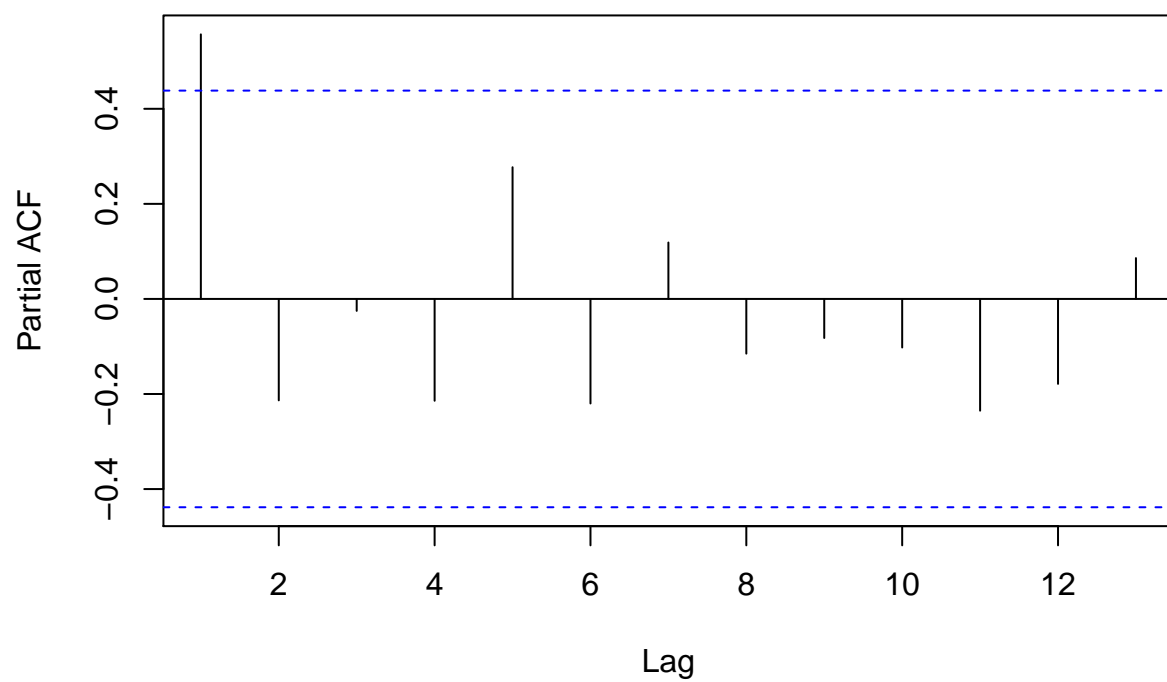




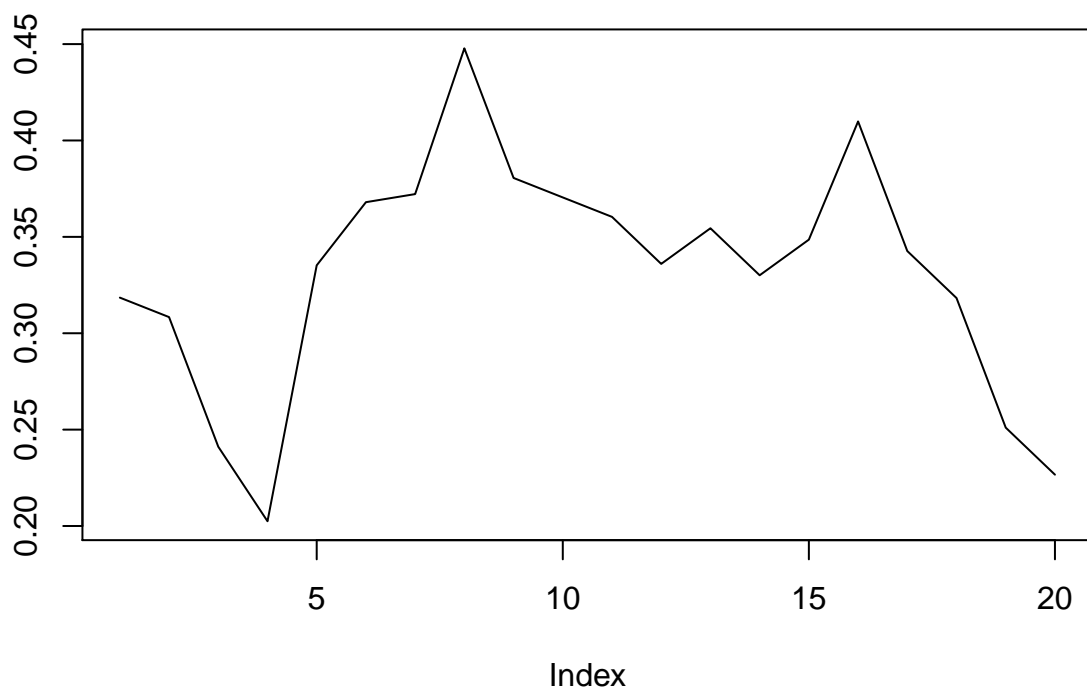
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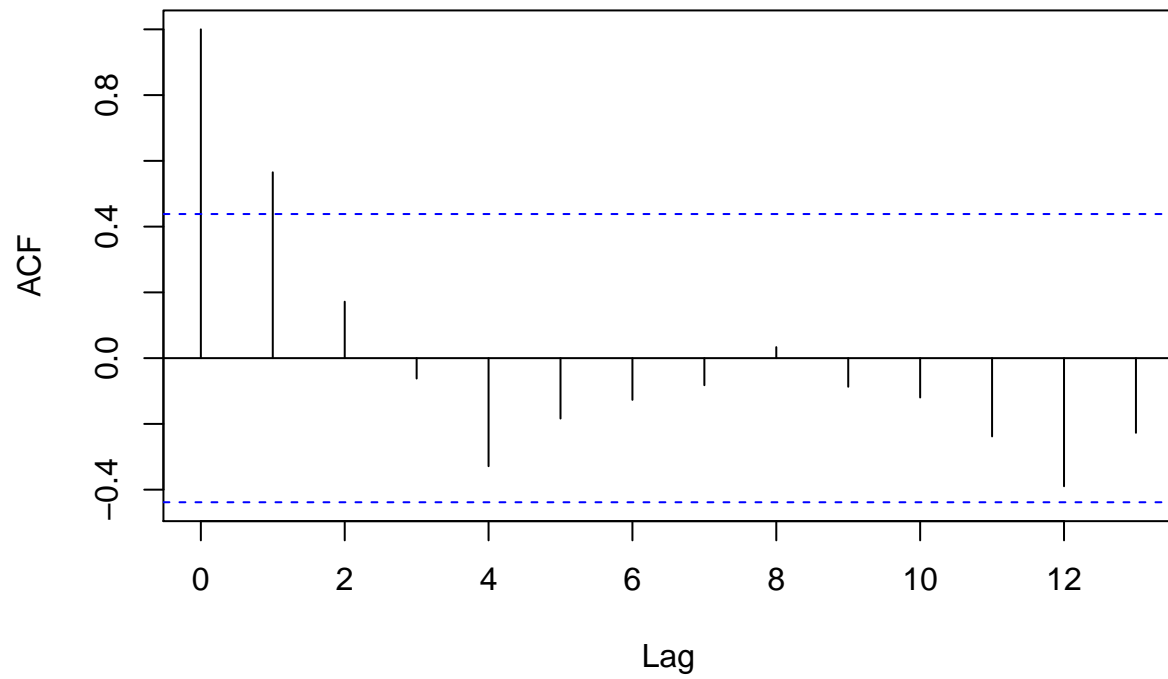
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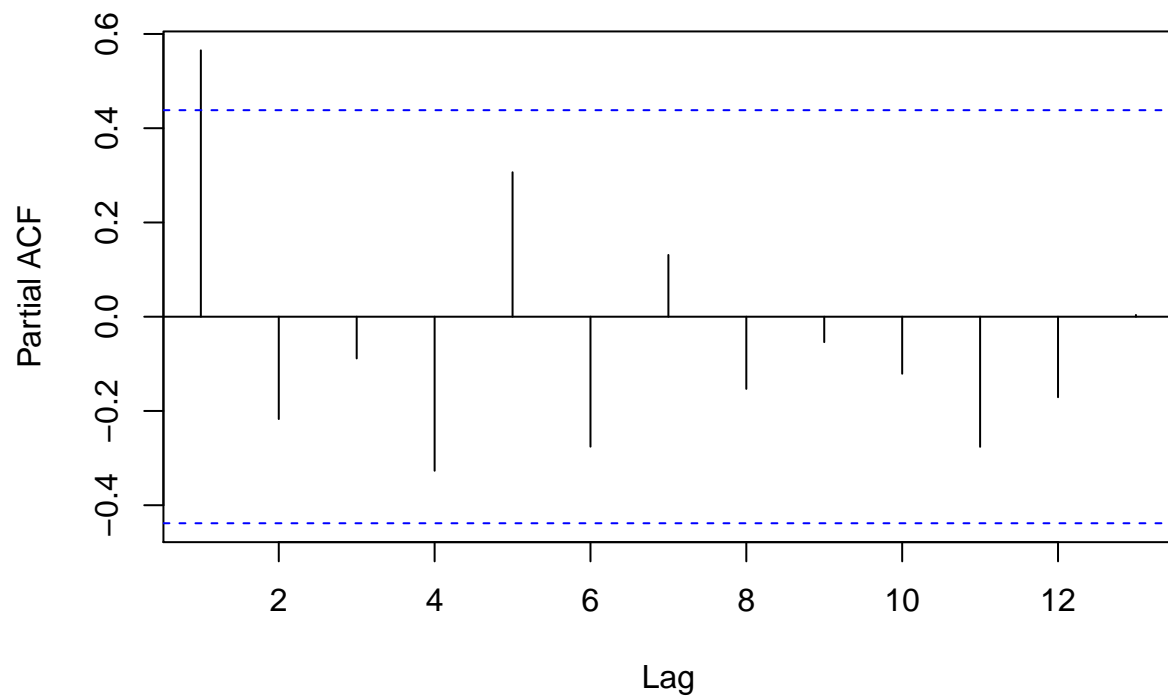
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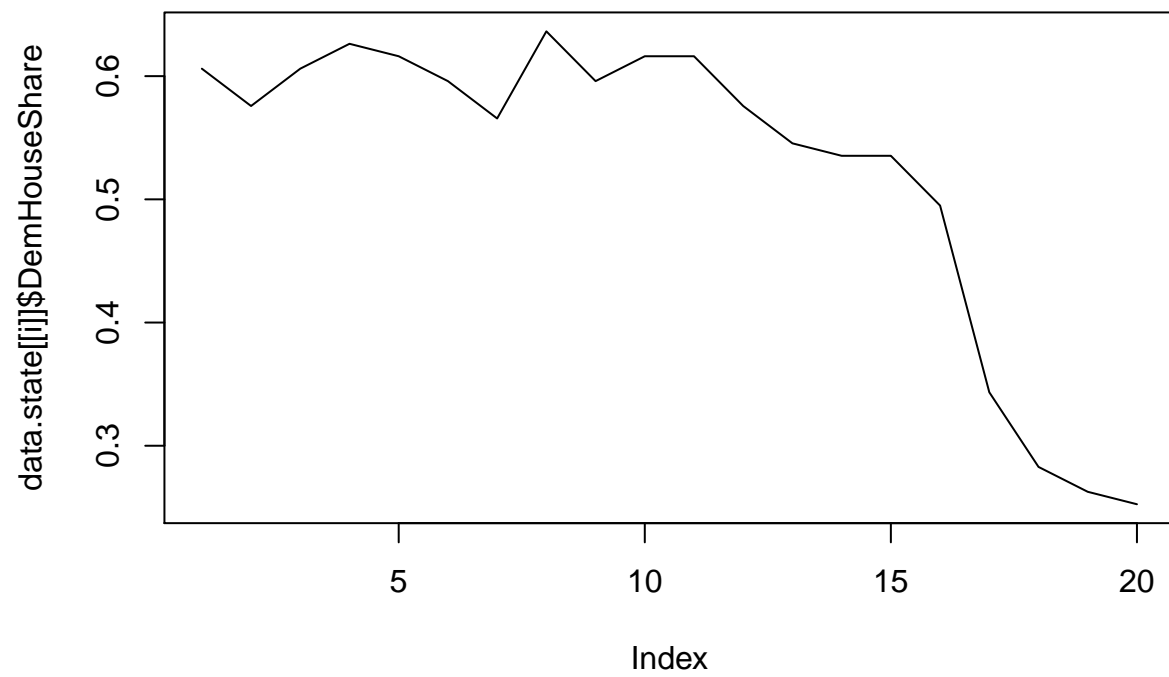


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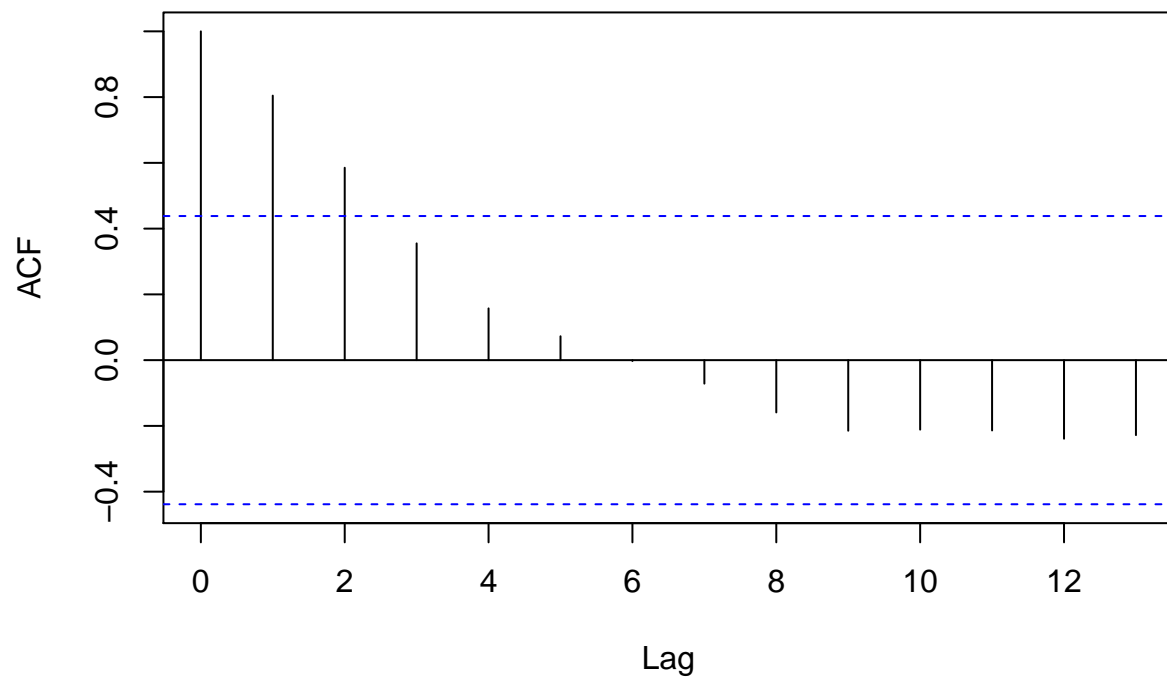



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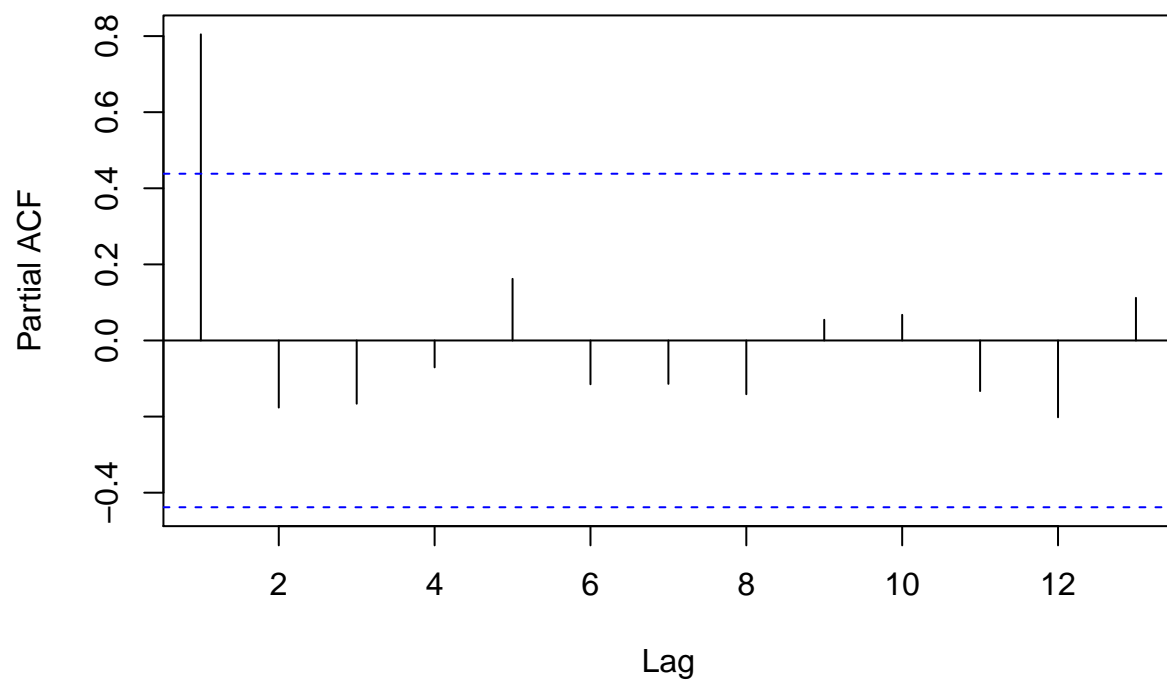




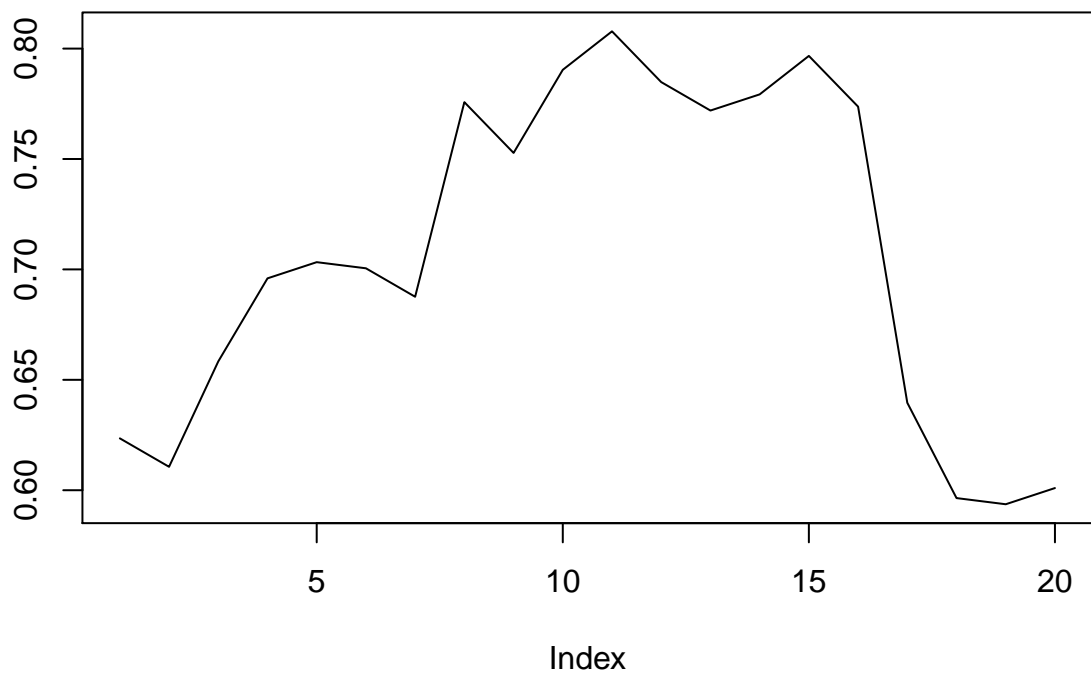
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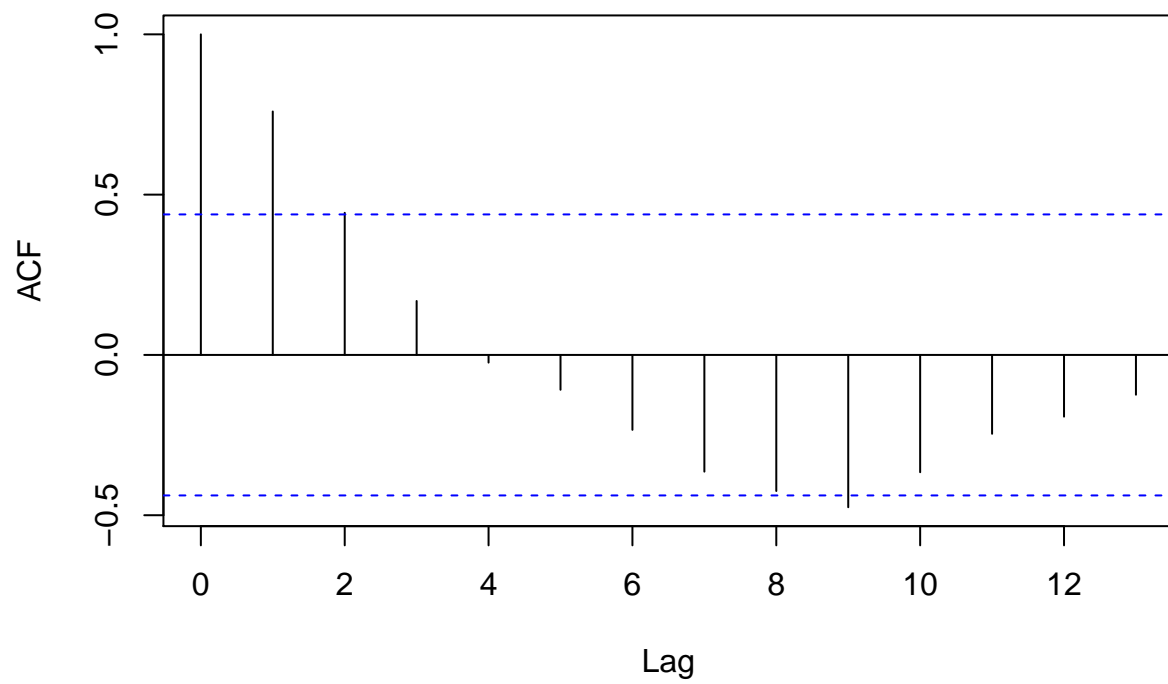
Series data.state[[i]]\$DemHouseShare



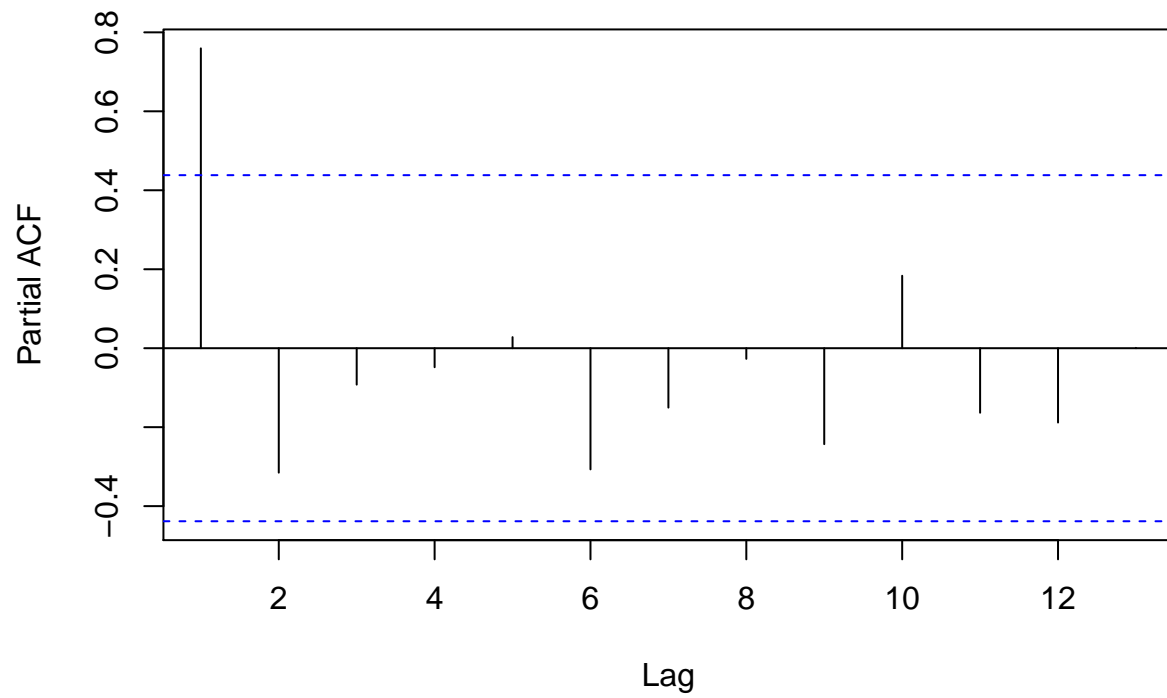
d.ts(ts = data.state[[i]]\$DemHouseShare, period = data.state[

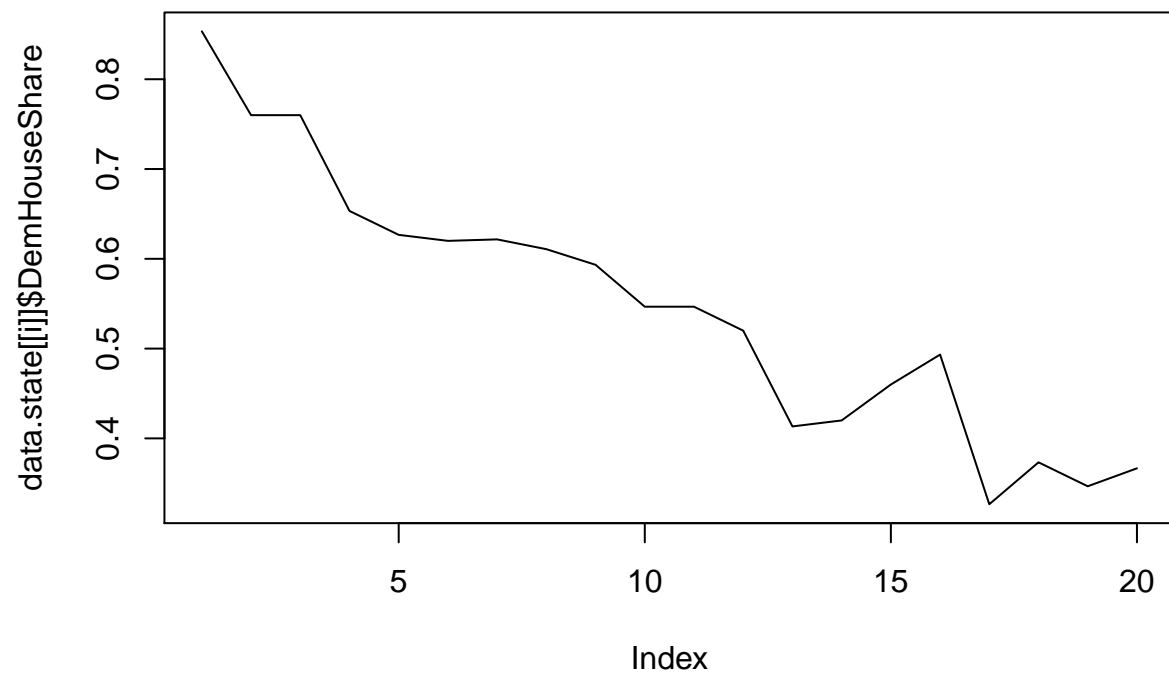


```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```

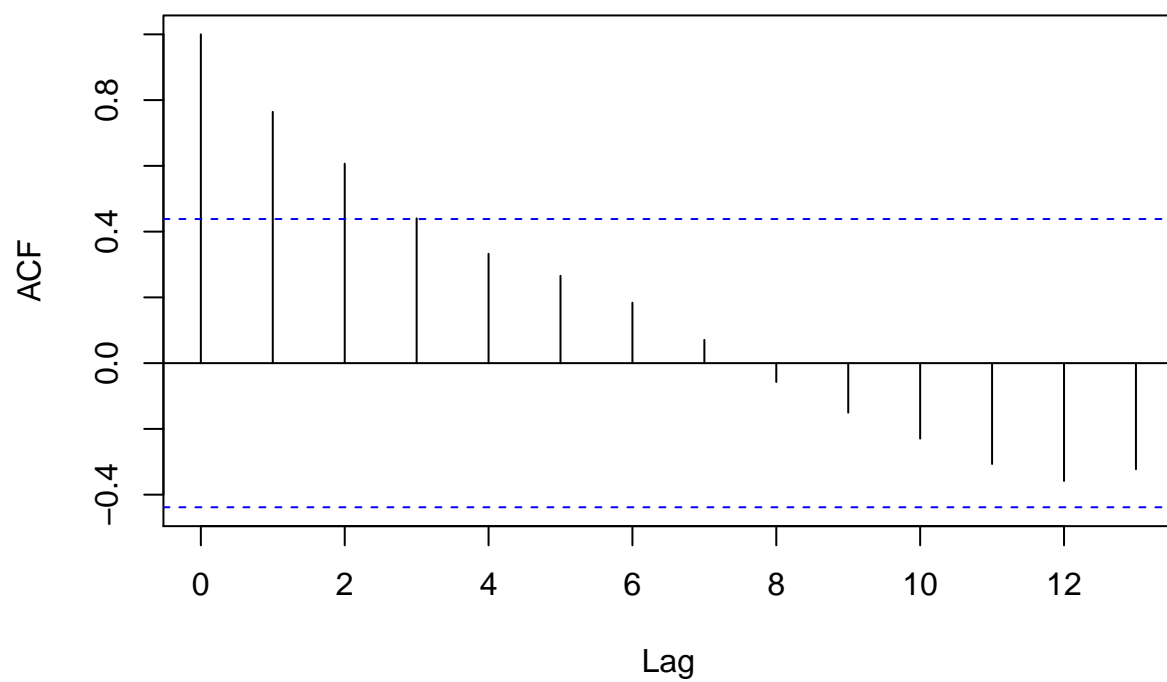


```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```

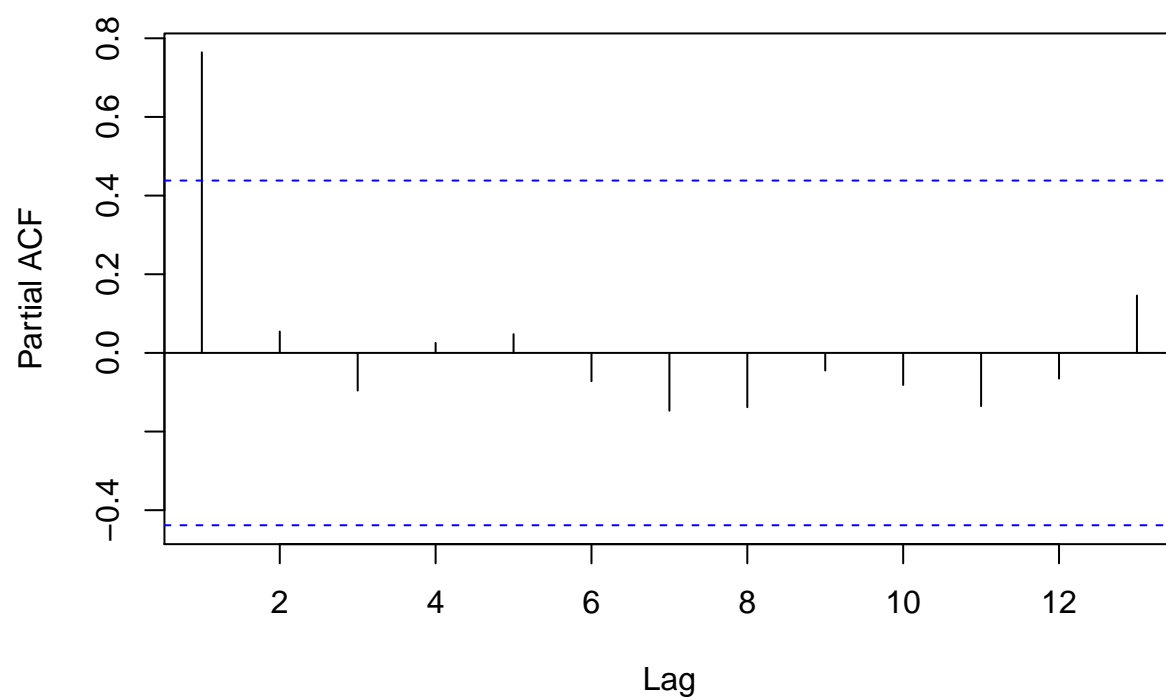




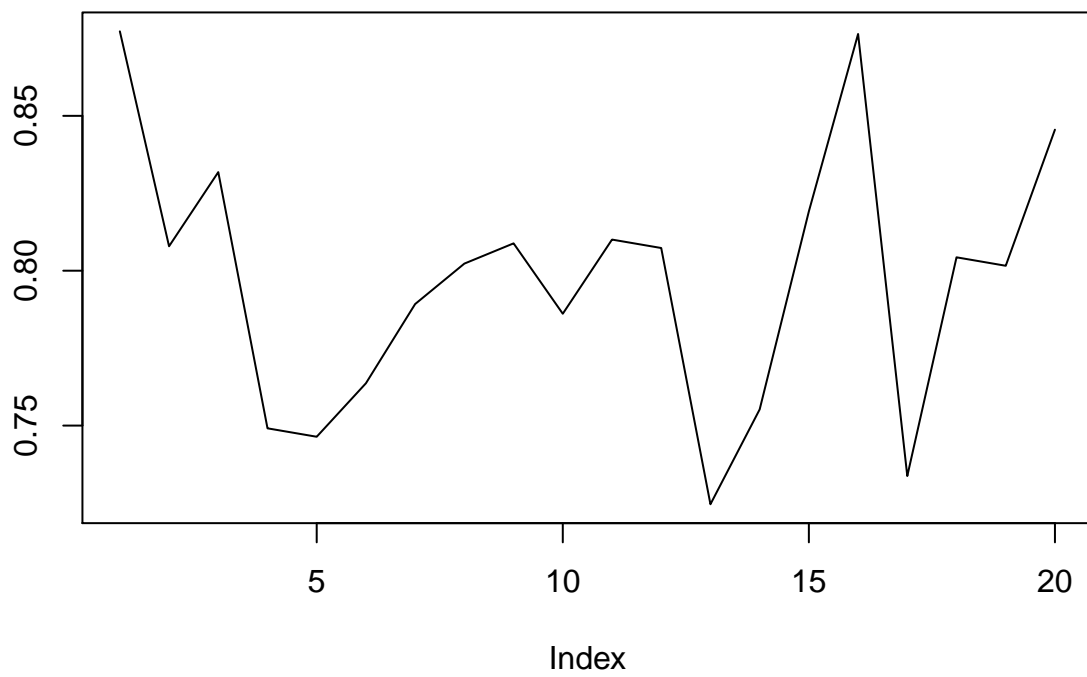
Series data.state[[i]]\$DemHouseShare



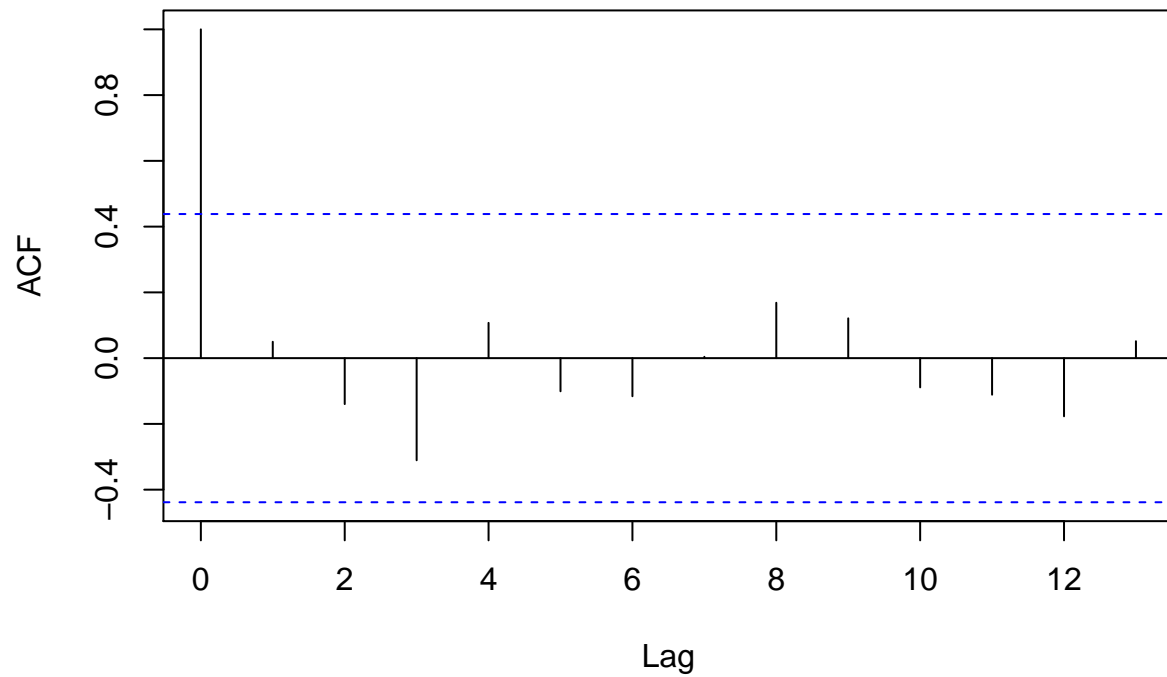
Series data.state[[i]]\$DemHouseShare



d.ts(ts = data.state[[i]]\$DemHouseShare, period = data.state[



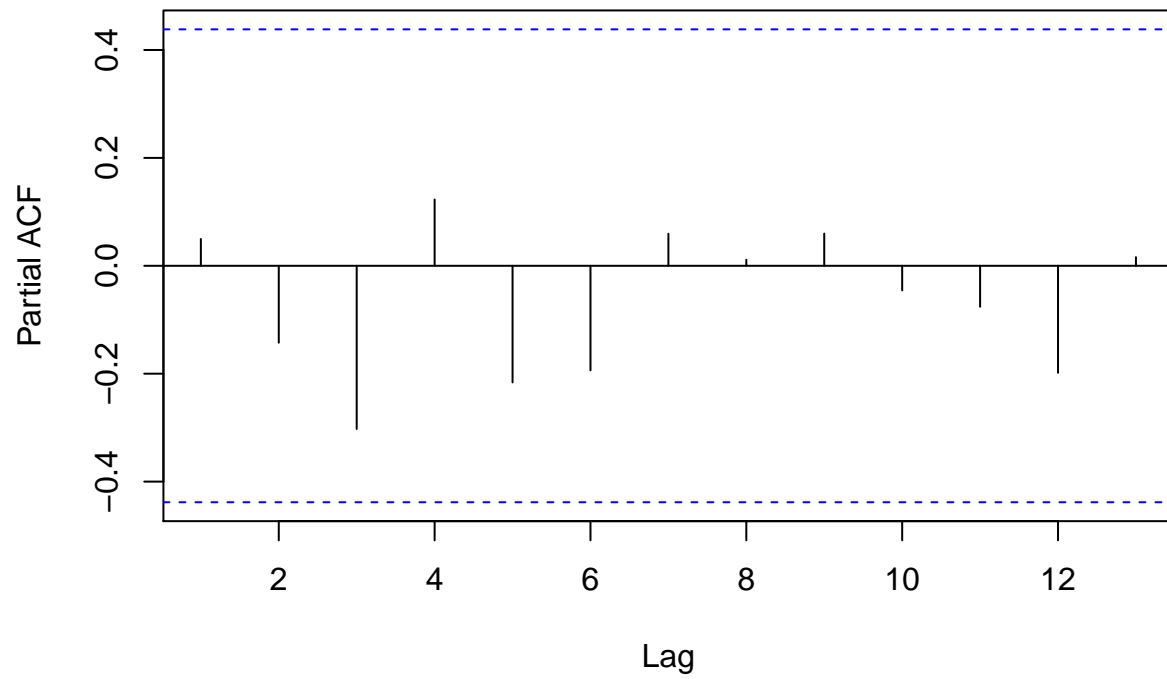
```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[[i]]$Year)
```

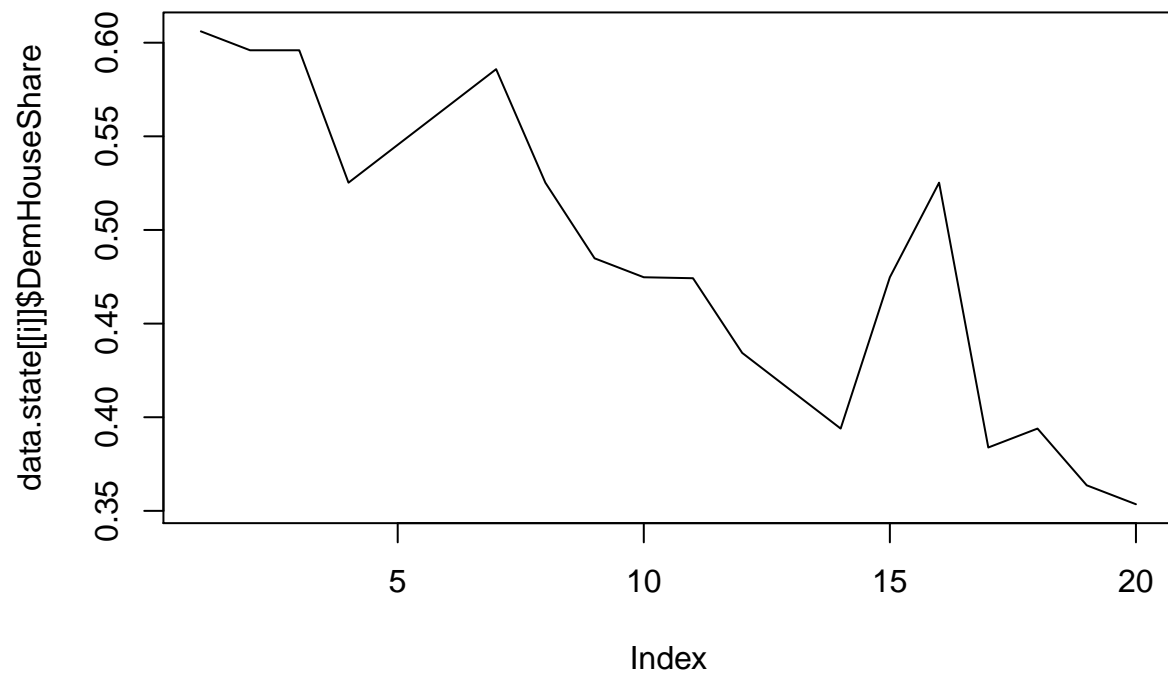


```
## Warning in adf.test(data.state[[i]]$DemHouseShare): p-value smaller than
## printed p-value

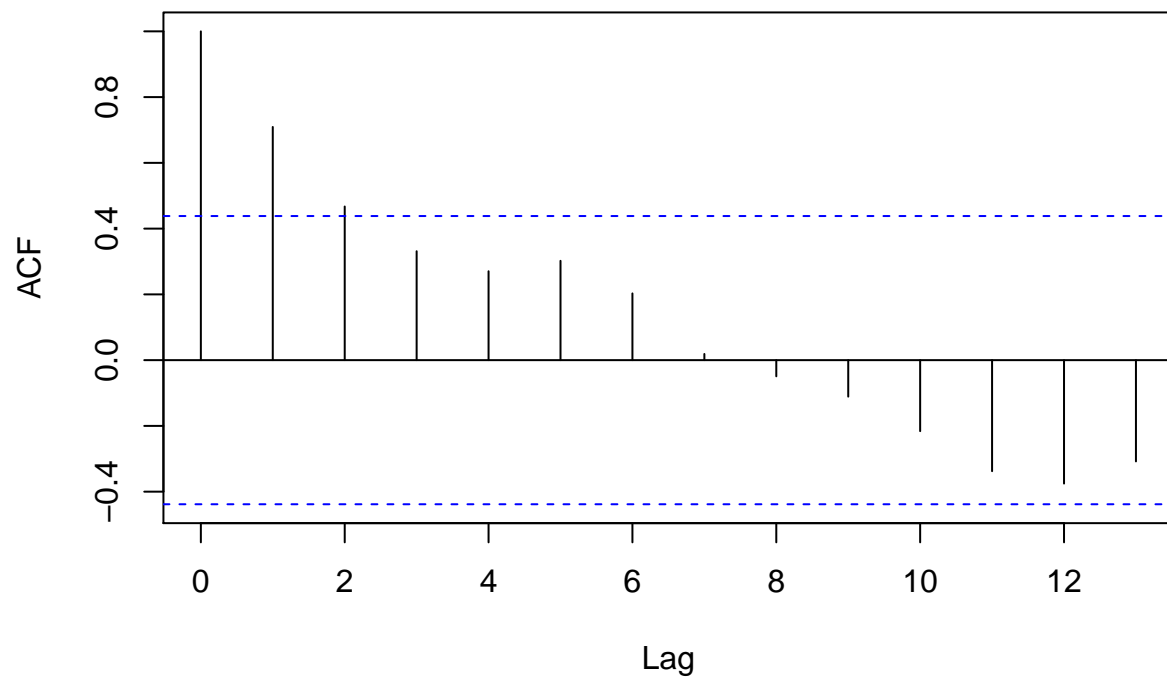
## Warning in adf.test(detrend.ts(ts = data.state[[i]]$DemHouseShare, period =
## data.state[[i]]$Year)): p-value smaller than printed p-value
```

```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```

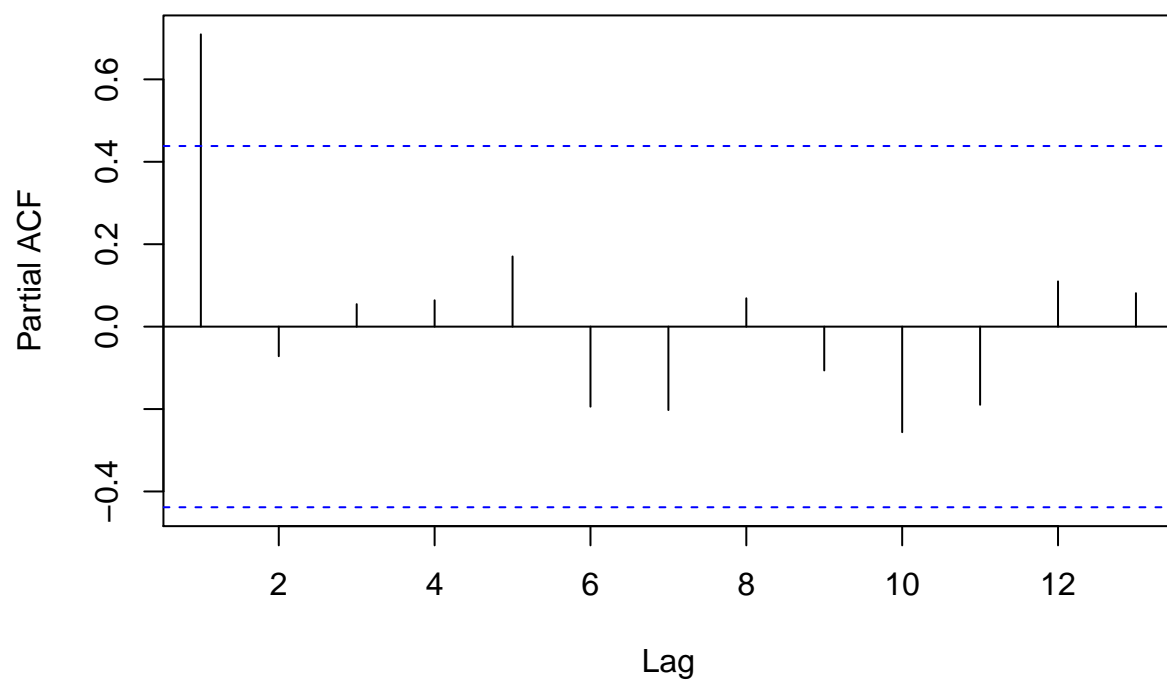




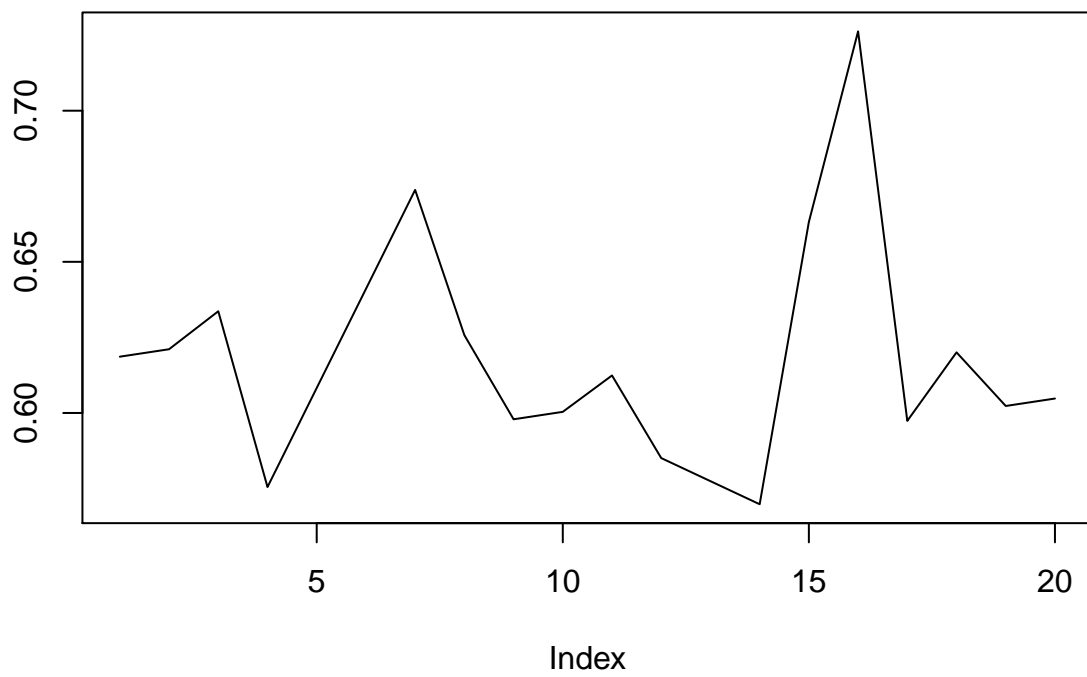
Series data.state[[i]]\$DemHouseShare



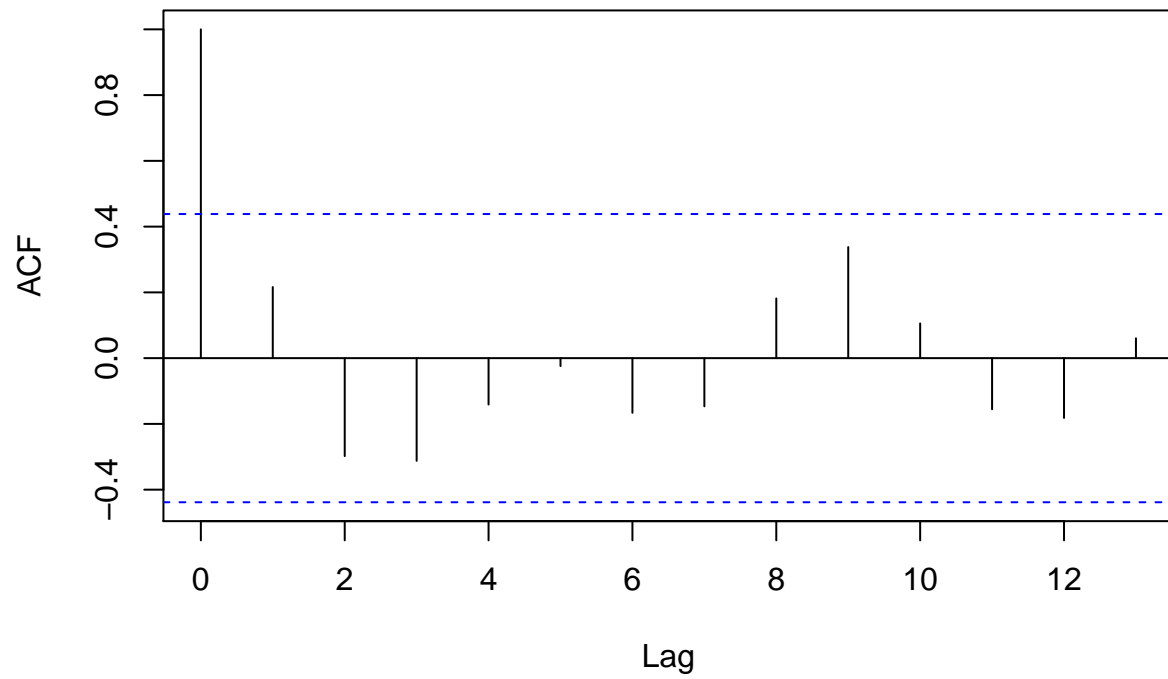
Series data.state[[i]]\$DemHouseShare



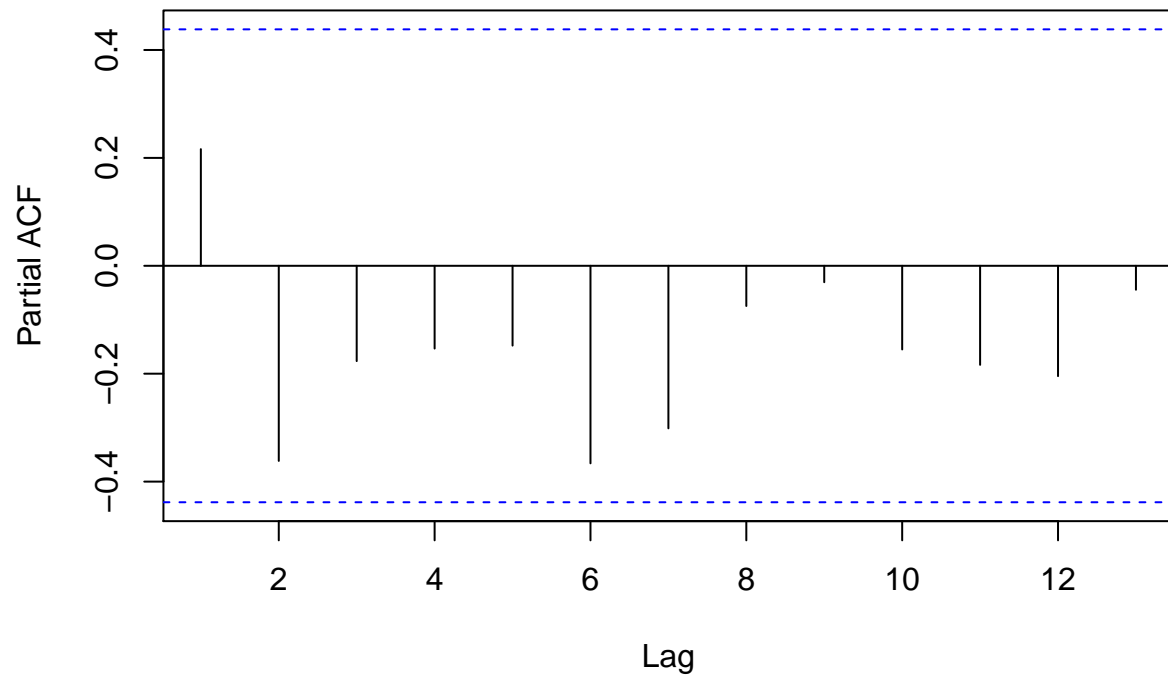
d.ts(ts = data.state[[i]]\$DemHouseShare, period = data.state[

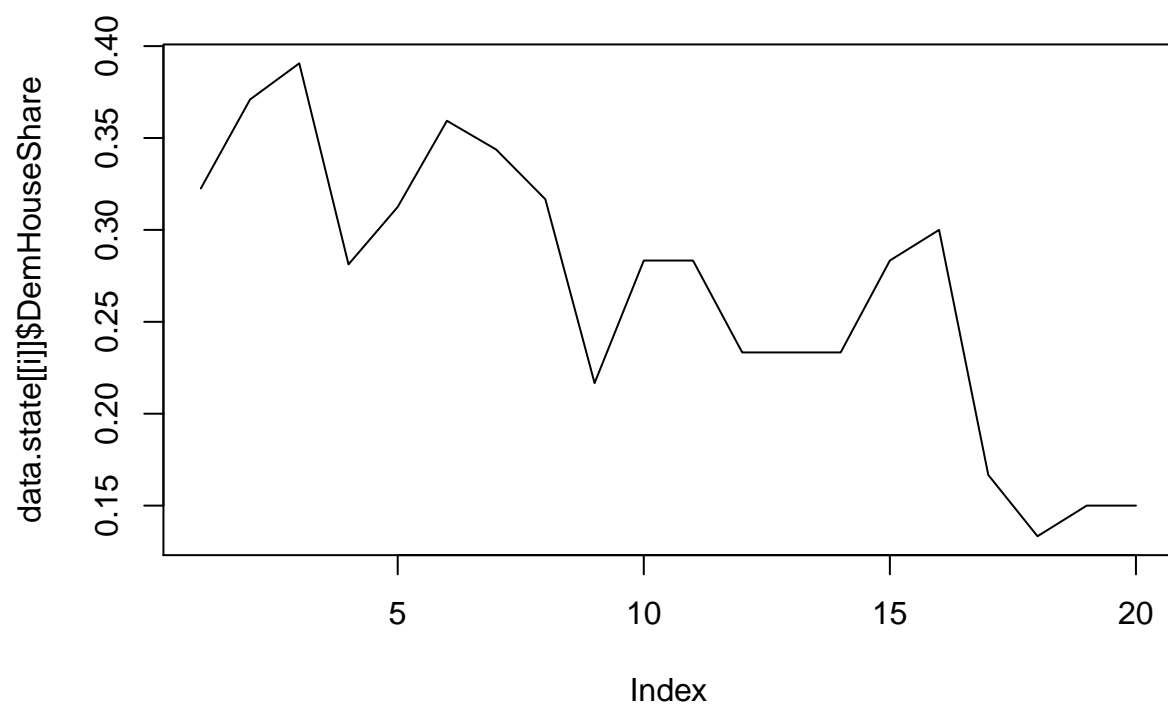


```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```

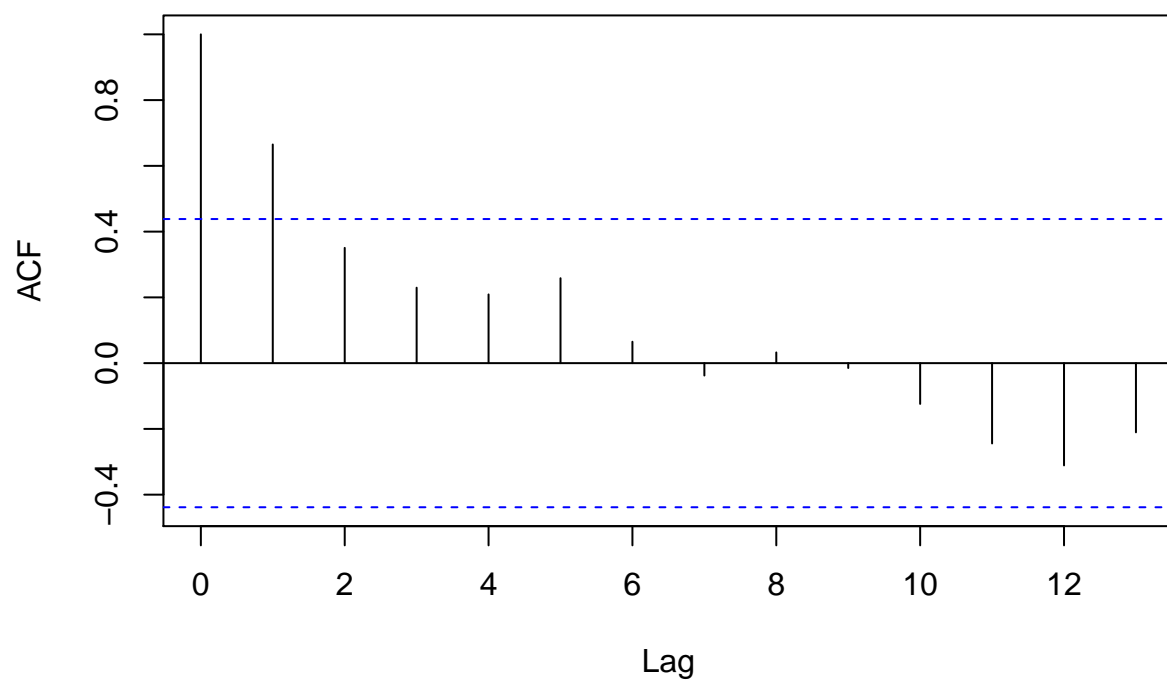


```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```

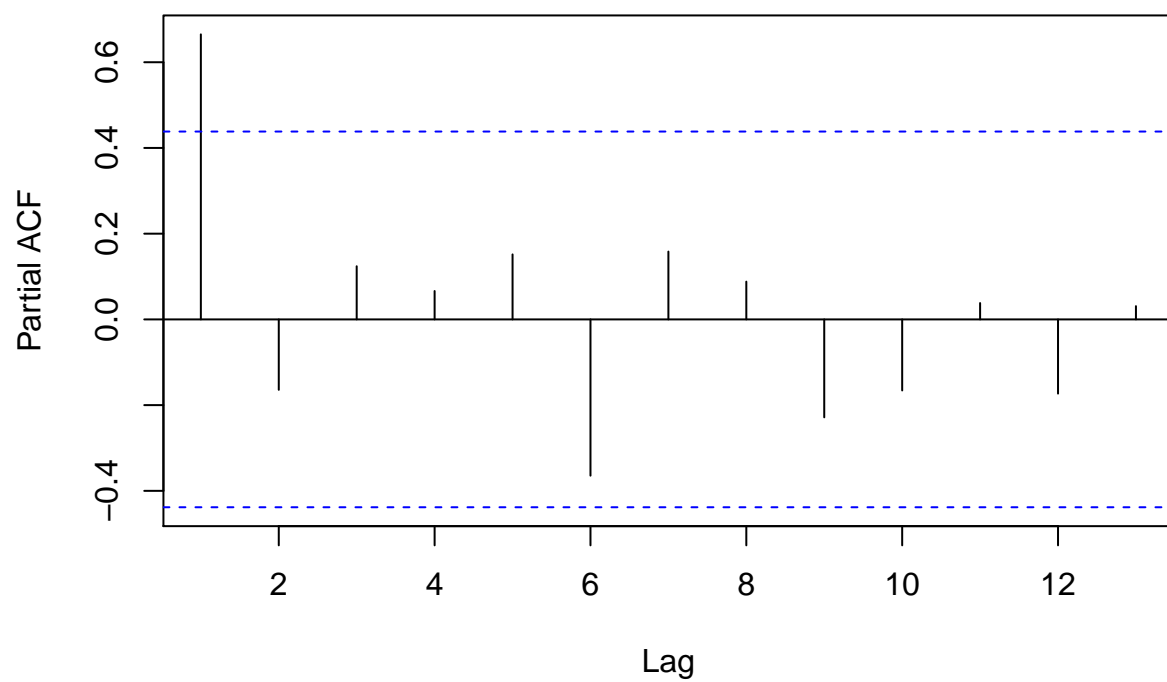




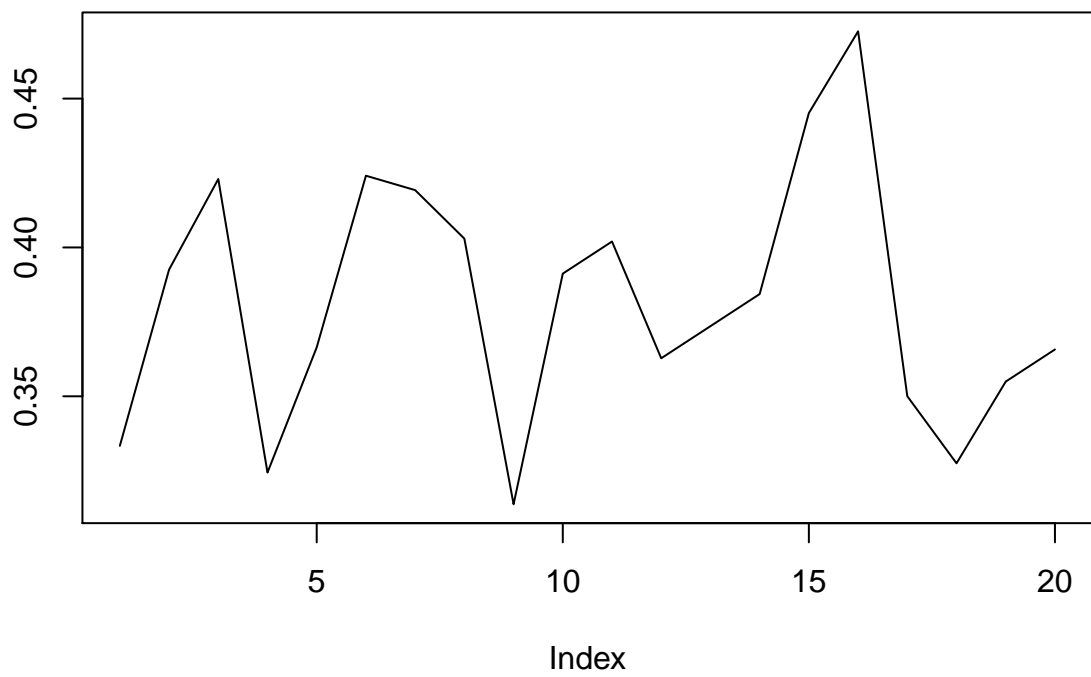
Series data.state[[i]]\$DemHouseShare



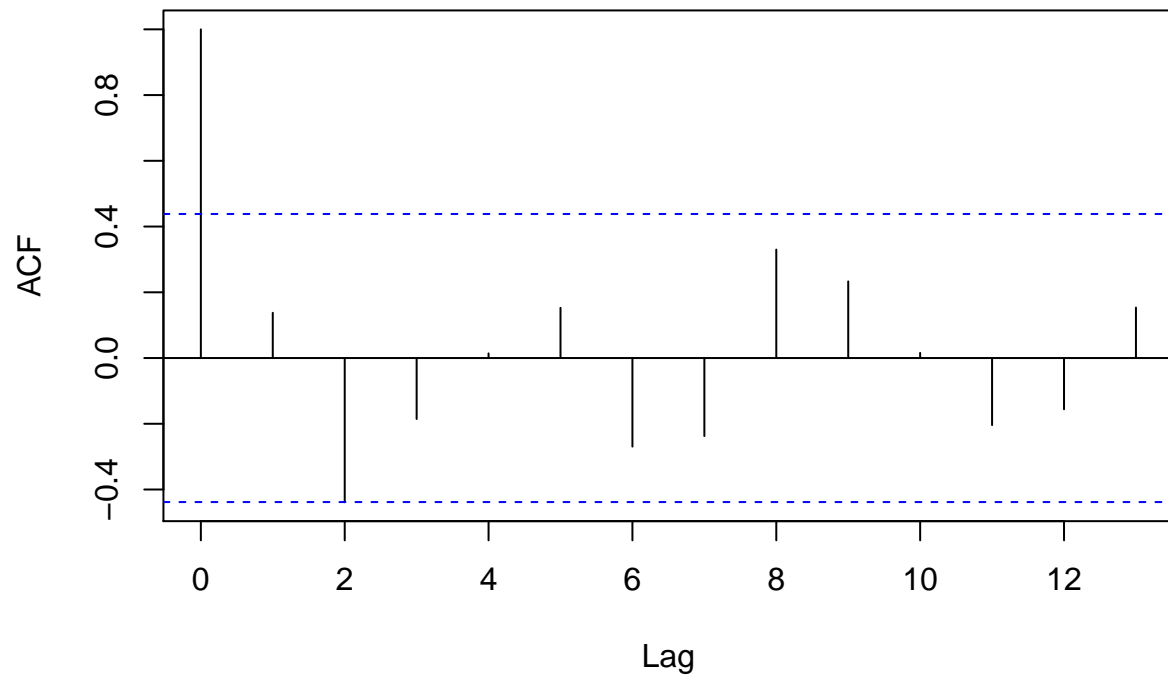
Series data.state[[i]]\$DemHouseShare



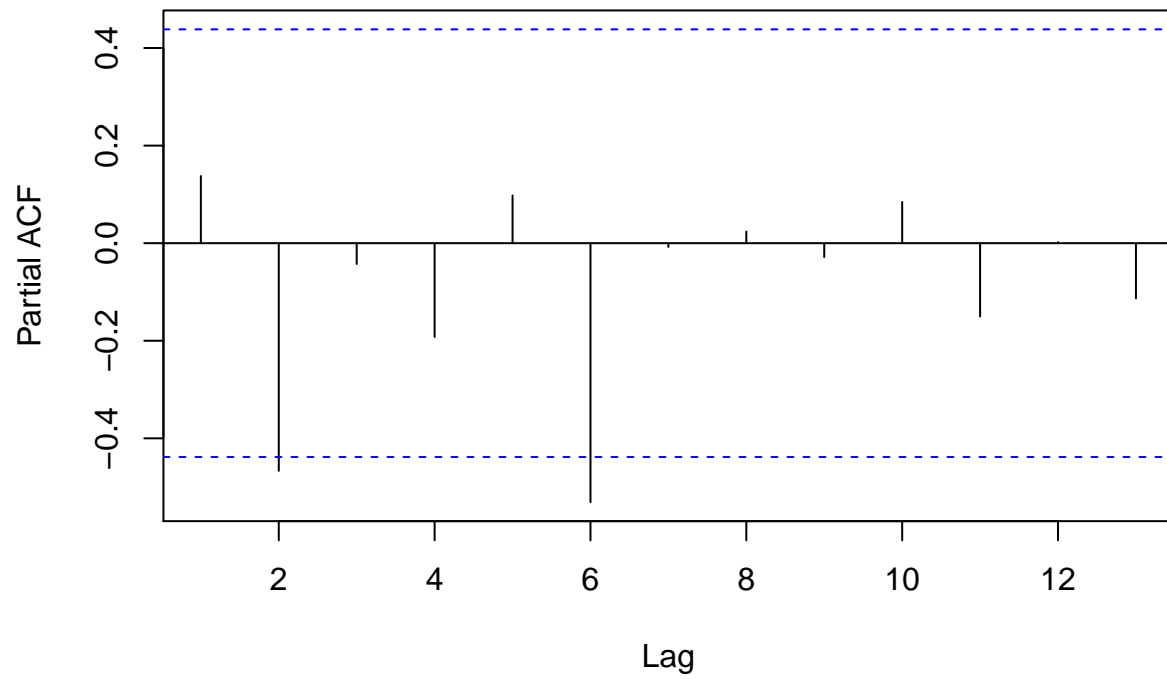
d.ts(ts = data.state[[i]]\$DemHouseShare, period = data.state[



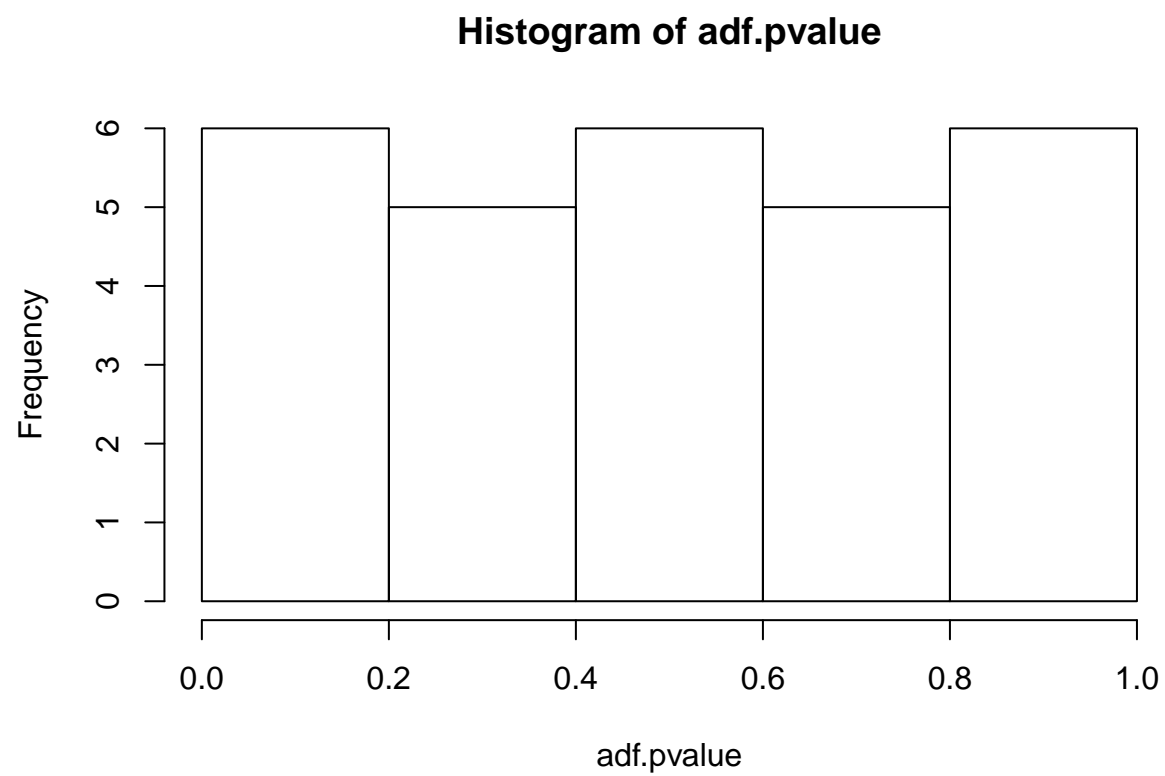
```
as detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```




```
es detrend.ts(ts = data.state[[i]]$DemHouseShare, period = data.state[
```

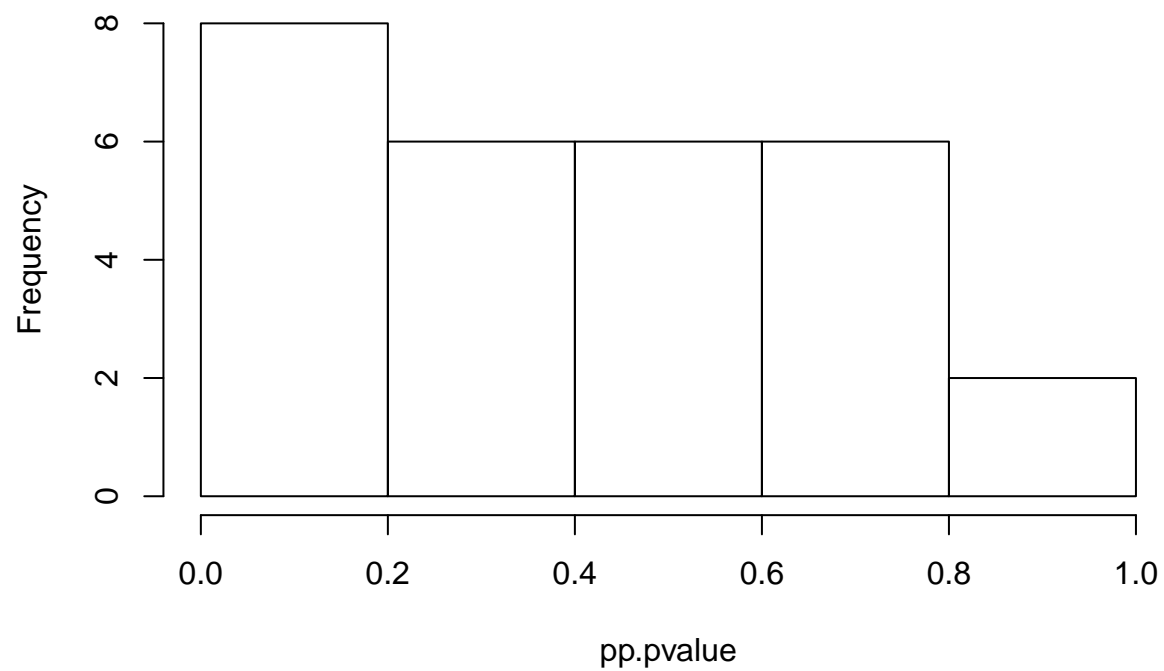


```
hist(adf.pvalue)
```



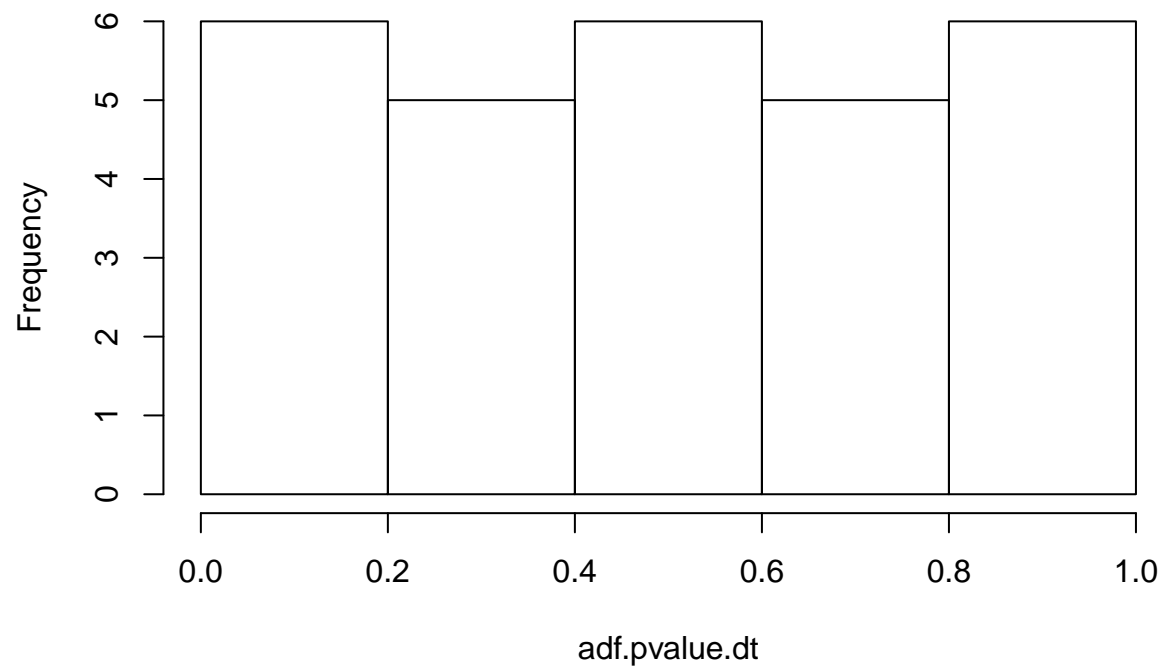
```
hist(pp.pvalue)
```

Histogram of pp.pvalue



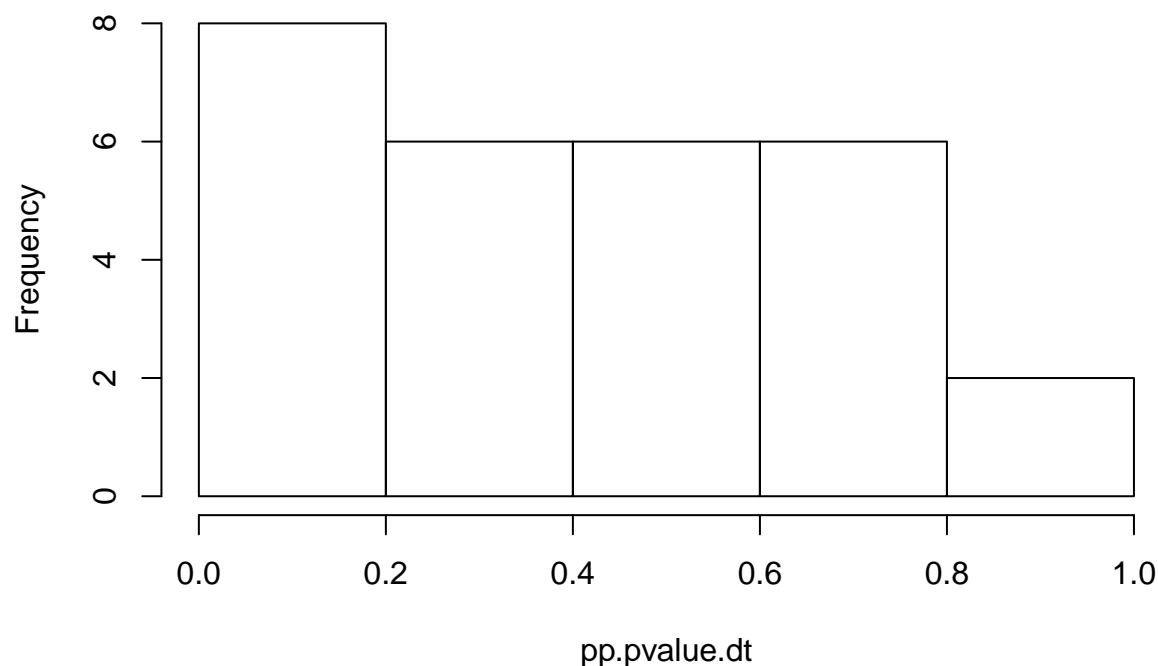
```
hist(adf.pvalue.dt)
```

Histogram of adf.pvalue.dt



```
hist(pp.pvalue.dt)
```

Histogram of pp.pvalue.dt



```
ts <- with(data,  
            data.frame(split(DemHouseShare, as.character(State))))  
purtest(ts, pmax=4, exo="intercept", test="ips")
```

```
##  
## Im-Pesaran-Shin Unit-Root Test (ex. var.: Individual Intercepts)  
##  
## data: ts  
## z = -1.0999, p-value = 0.1357  
## alternative hypothesis: stationarity
```

```
purtest(ts, pmax=4, exo="trend", test="ips")
```

```
##  
## Im-Pesaran-Shin Unit-Root Test (ex. var.: Individual Intercepts  
## and Trend)  
##  
## data: ts  
## z = -5.6466, p-value = 8.182e-09  
## alternative hypothesis: stationarity
```