12_acf_case_studies.R

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```
# Course: Time series analysis
# Exercise: 12th / ACF Case Studies
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```

```
require(astsa)
```

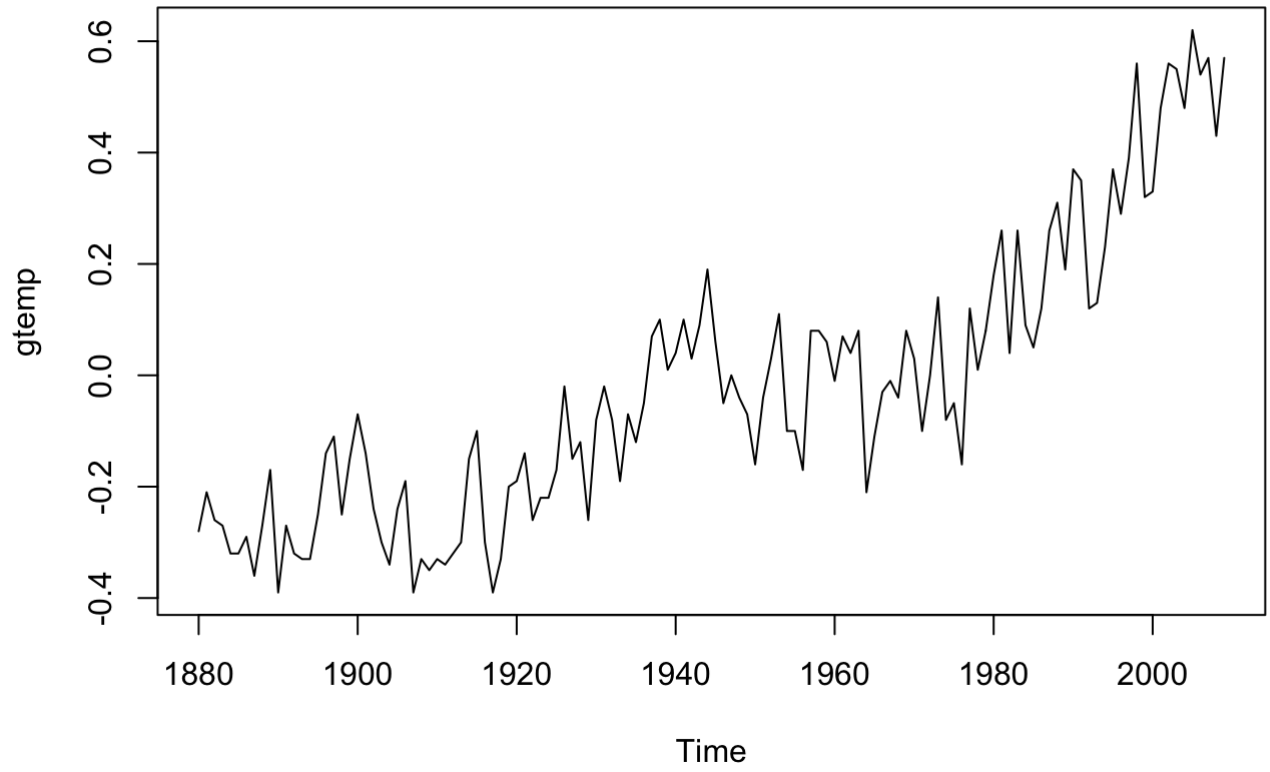
```
## Loading required package: astsa
```

```
require(tseries)
```

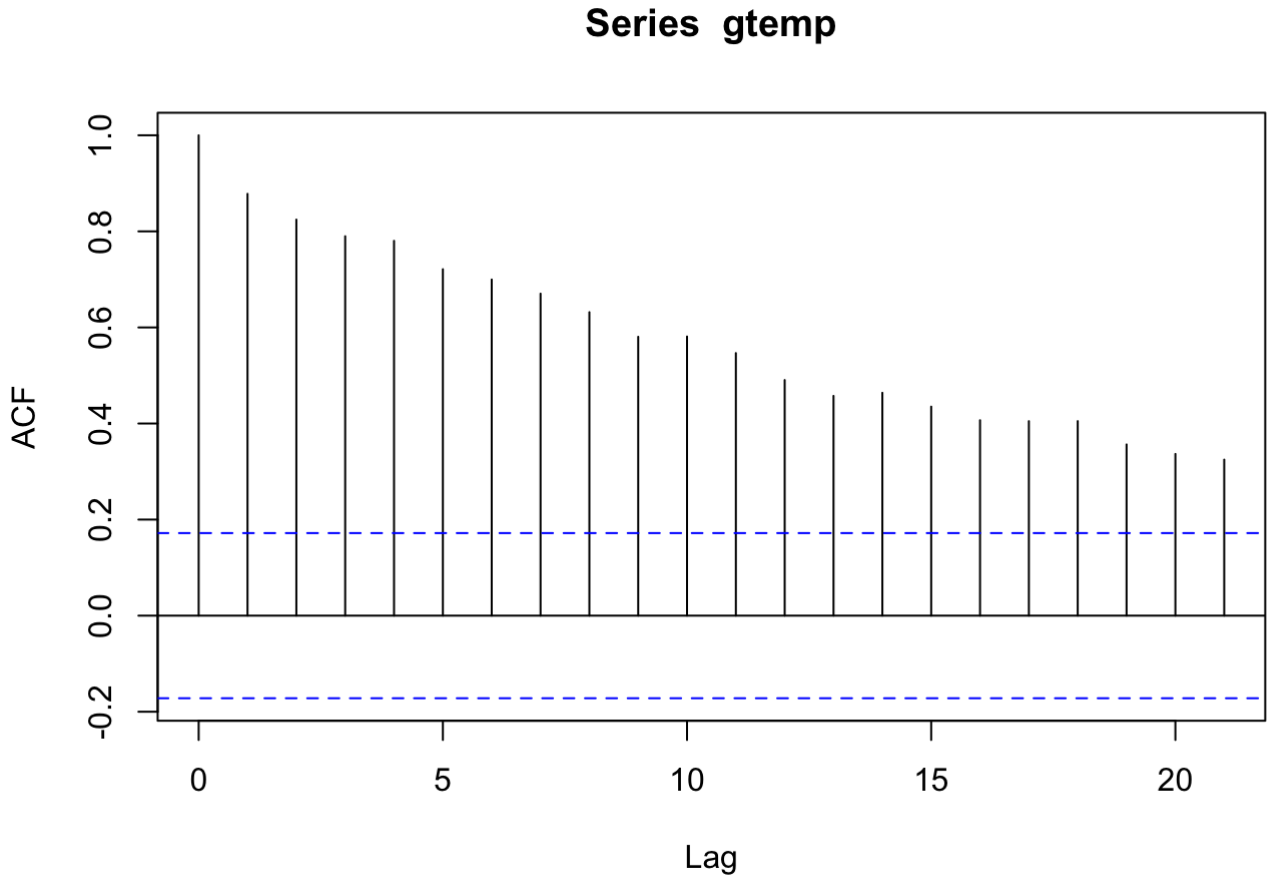
```
## Loading required package: tseries
```

```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
```

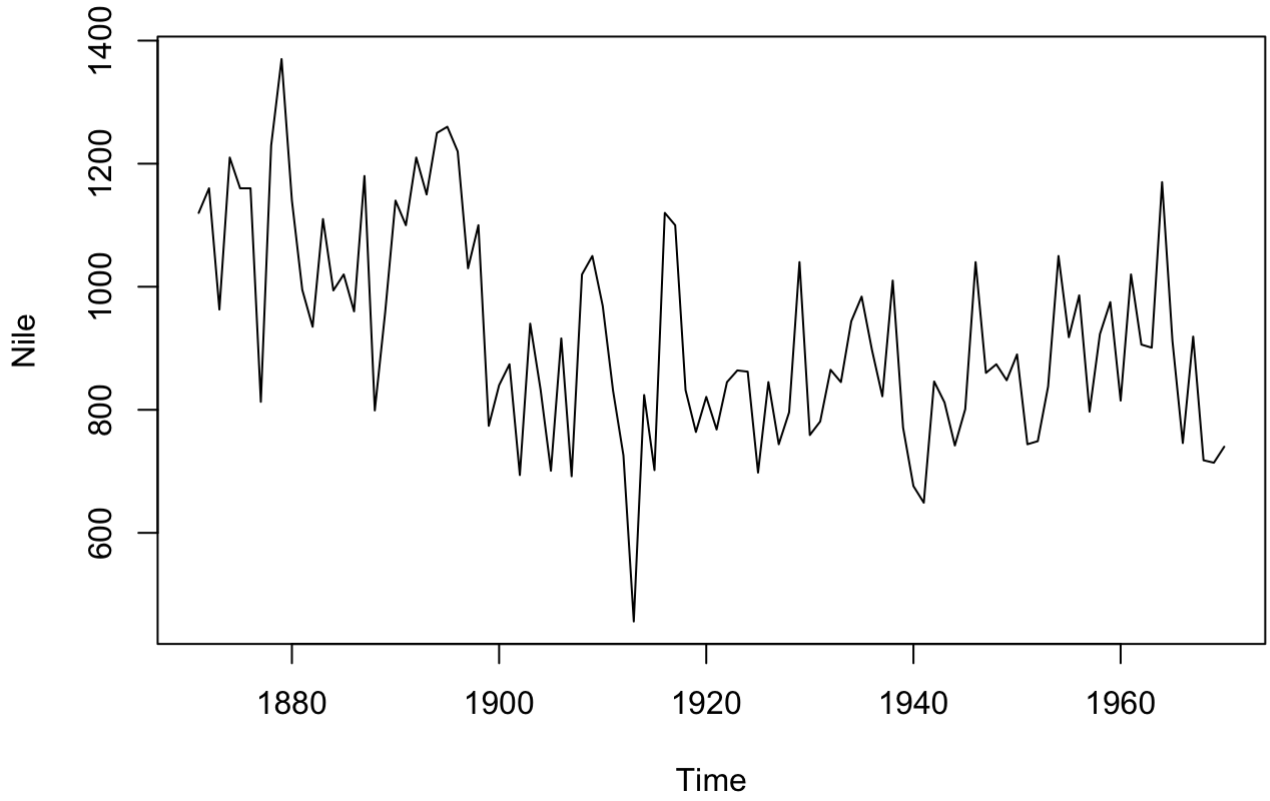
```
# def. (weakly) stationary:
# I: μ(t) = μ
# II: σ^2(t) = σ^2
# III: γ(t, s) = γ(t − s)

# 1
plot(gtemp)
```


gtemp
-0.4
-0.2
0.0
0.2
0.4
0.6
1880
1900
1920
1940
1960
1980
2000
Time

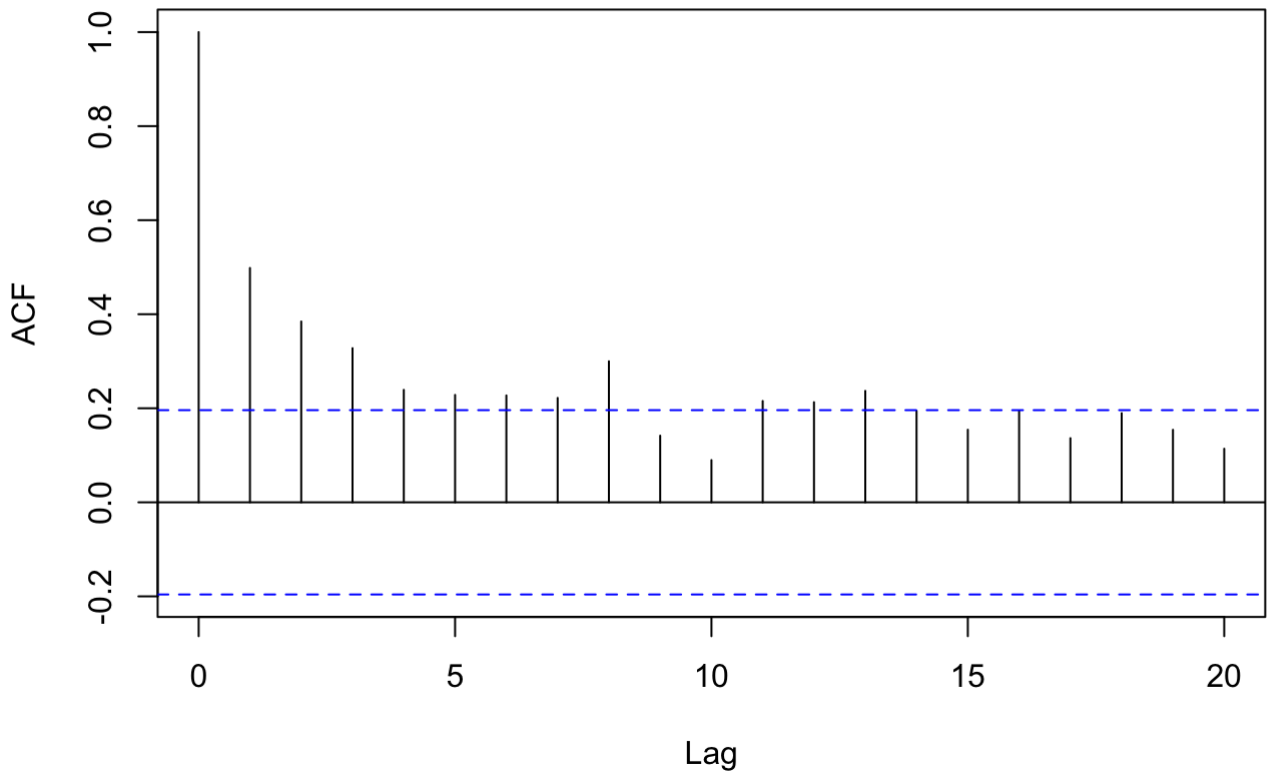
```
acf(gtemp)
```


Series gtemp
ACF
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
0
5
10
15
20
Lag

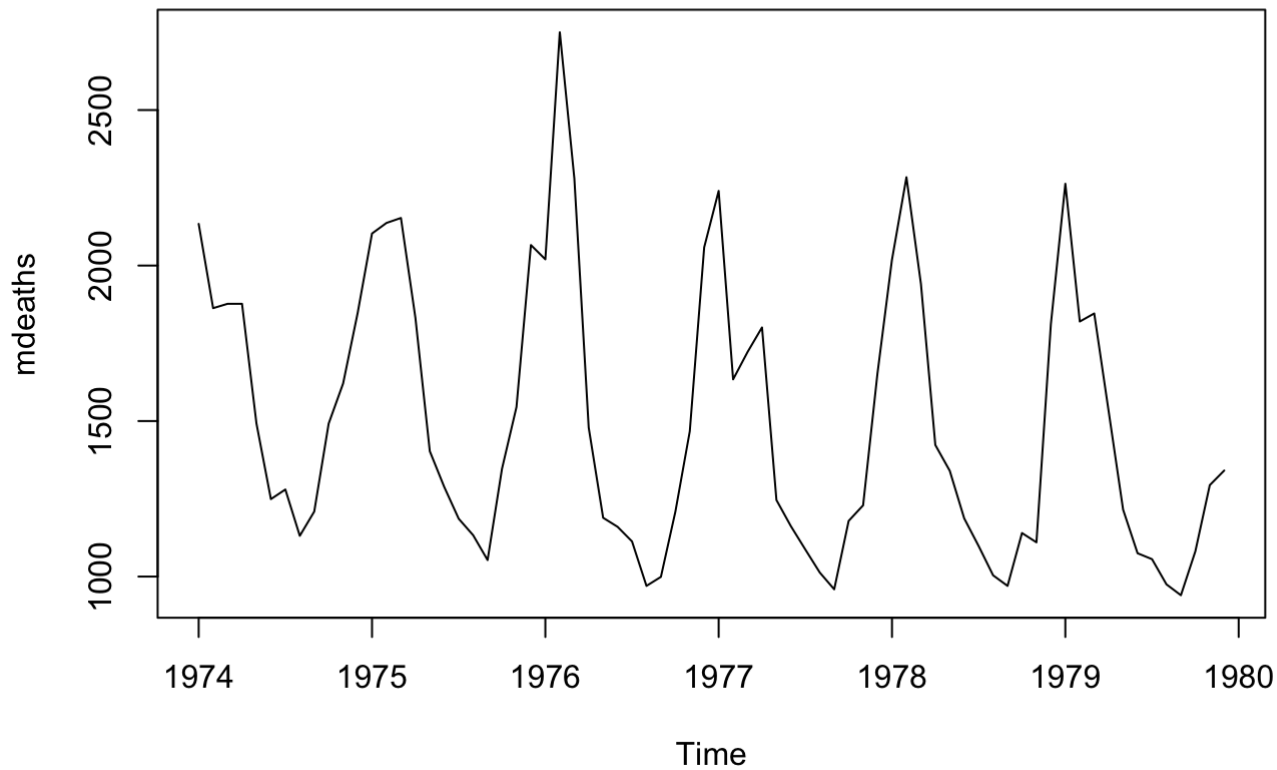
```
# 2
plot(Nile)
```



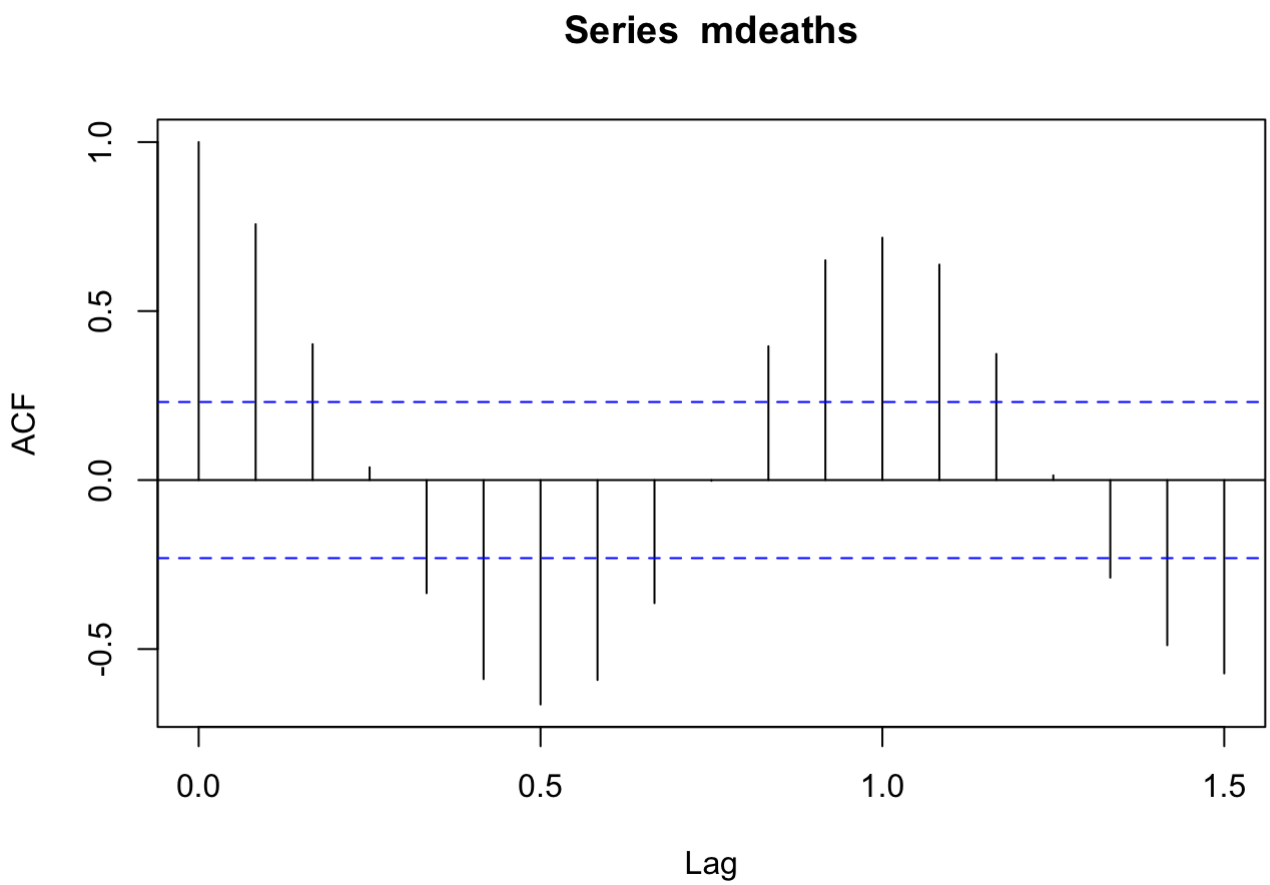

```
acf(Nile)
```



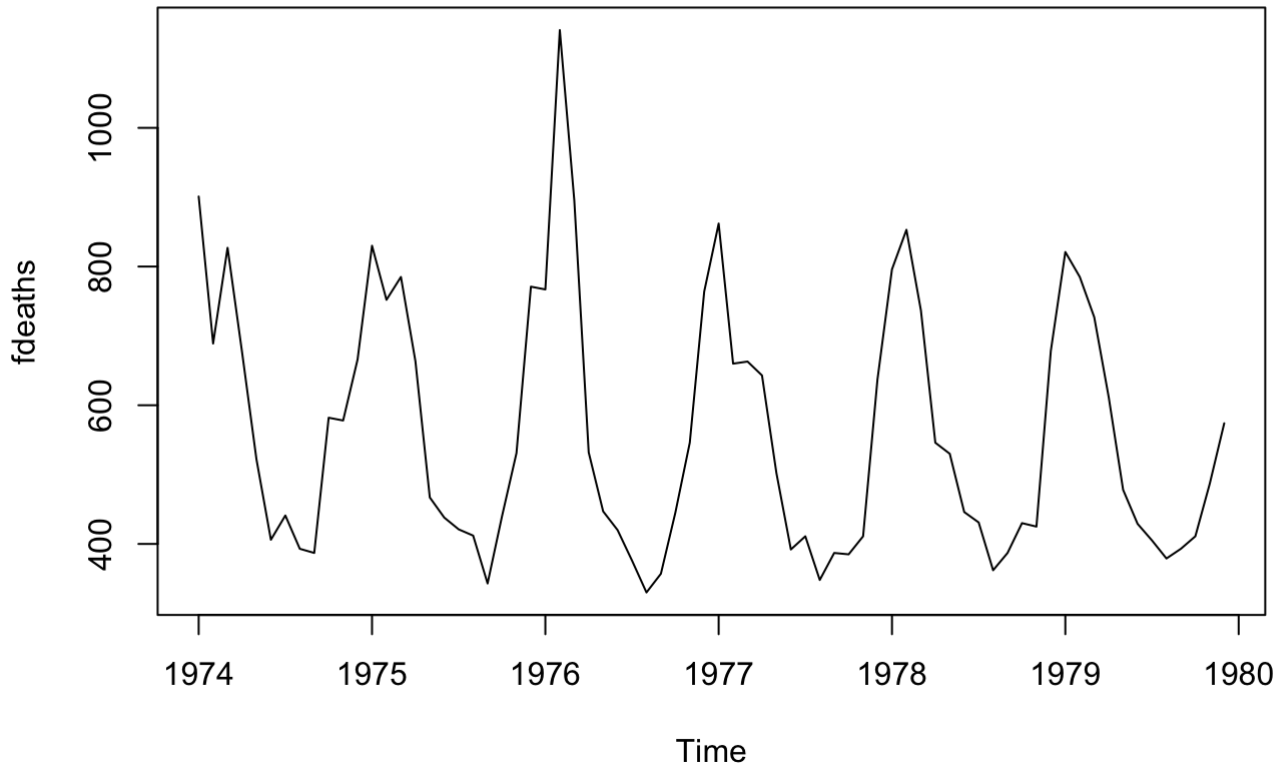

```
# 3
plot(mdeaths)
```



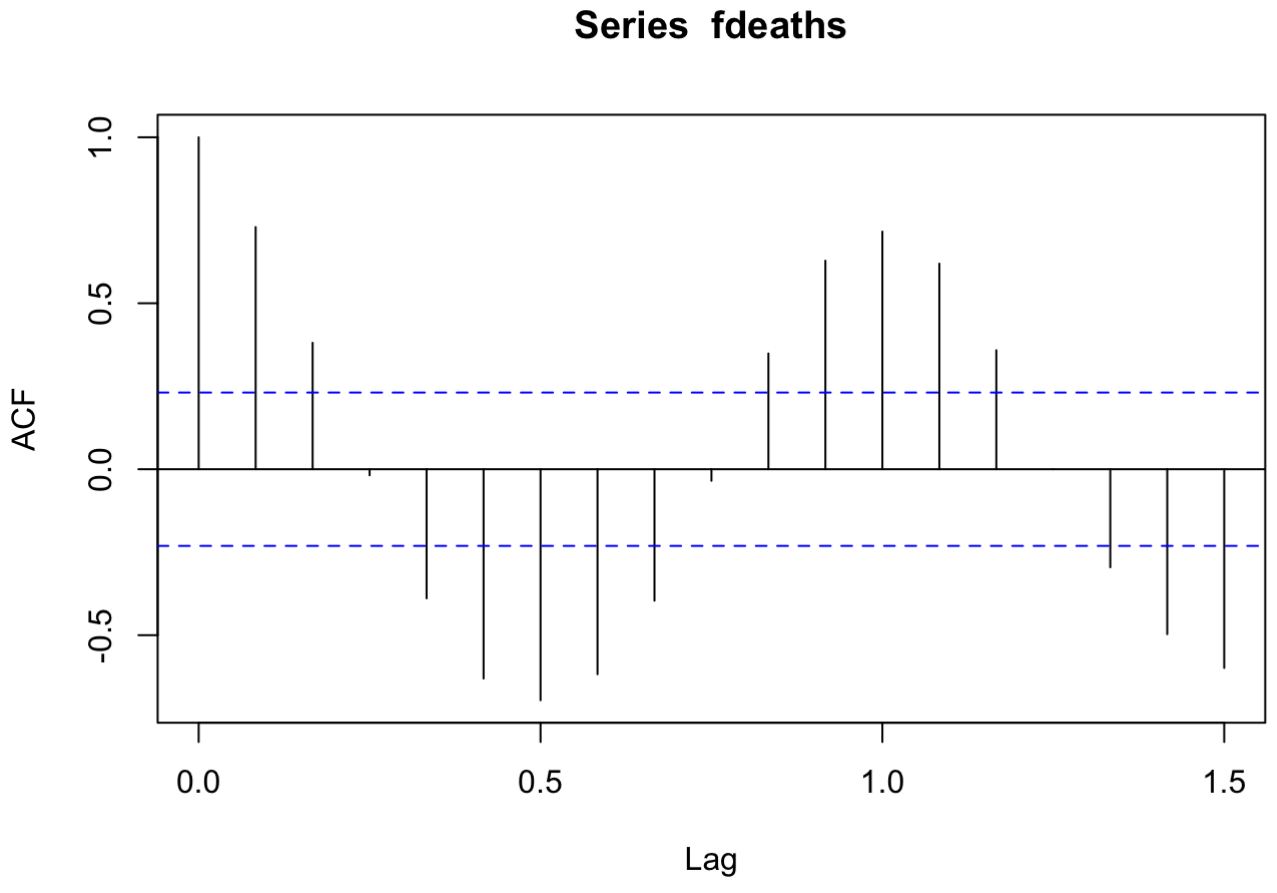
```
acf(mdeaths)
```



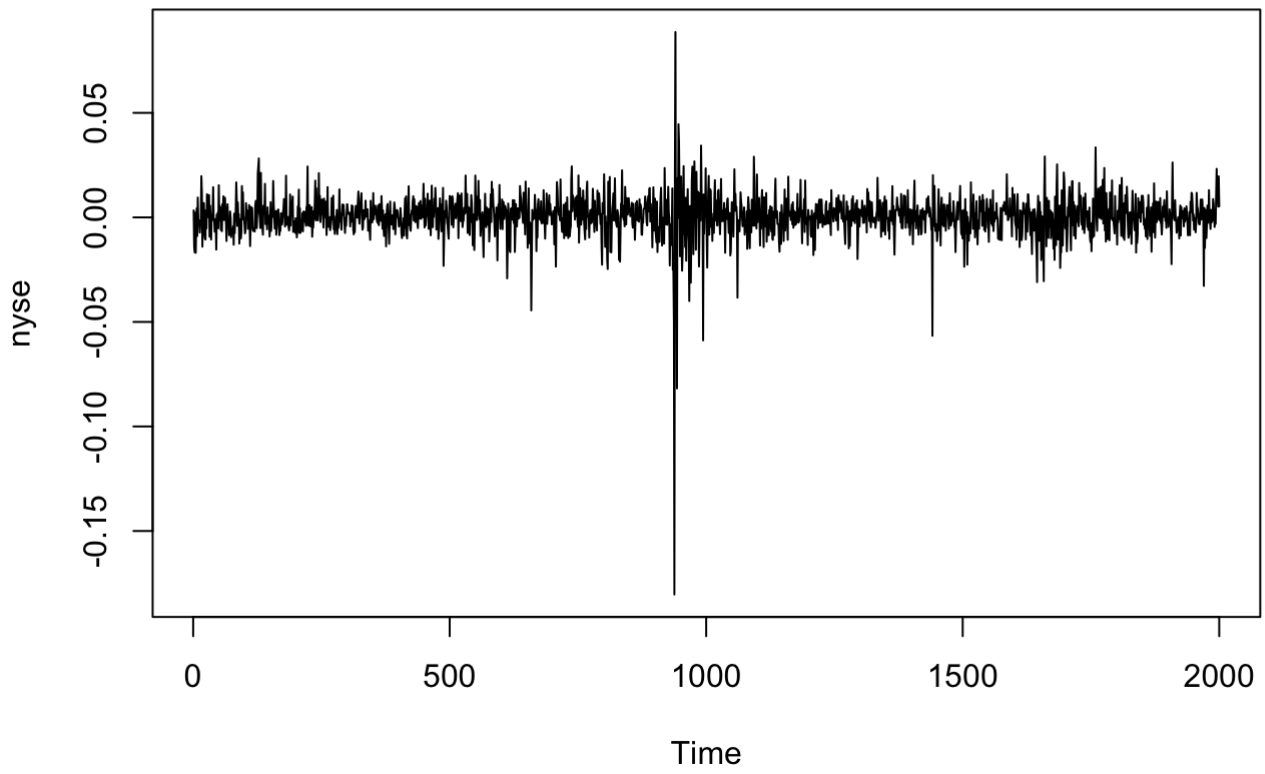

```
plot(fdeaths)
```


fdeaths
400
600
800
1000
1974
1975
1976
1977
1978
1979
1980
Time

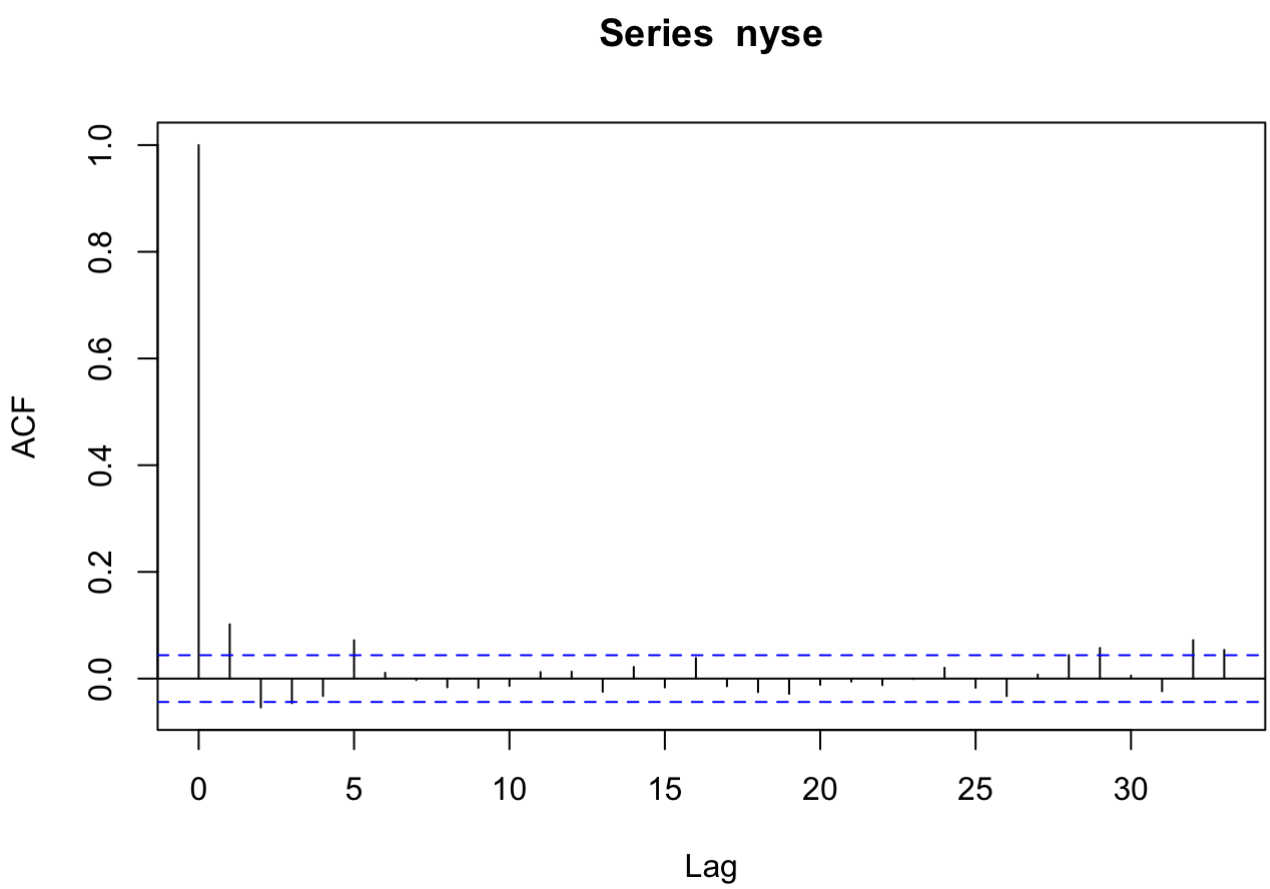
```
acf(fdeaths)
```


Series fdeaths
ACF
1.0
0.5
0.0
-0.5
0.0
0.5
1.0
1.5
Lag

```
# 4
plot(nyse)
```




```
acf(nyse)
```




```
acf(nyse, lag.max = 1000) # could be generated by a stationary process
```