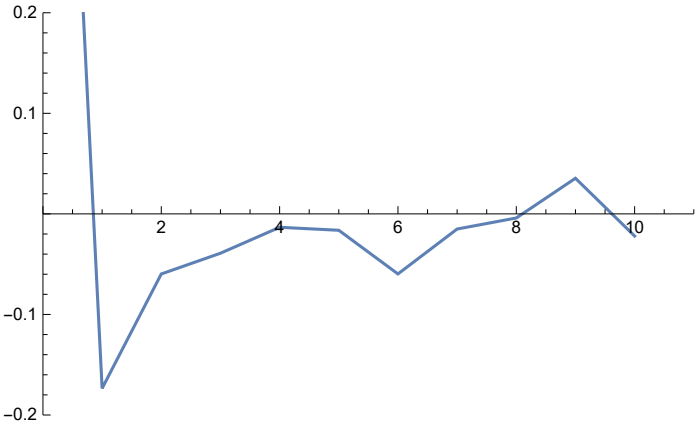
```
ClearAll["Global*`"]
returns = TemporalData[
  Differences@Log@First[Transpose[Import[NotebookDirectory[] <> "AA_170210.csv"]]]]
```

```
TemporalData[ Time: 0 to 4677
              Data points: 4678   Paths: 1 ]
```

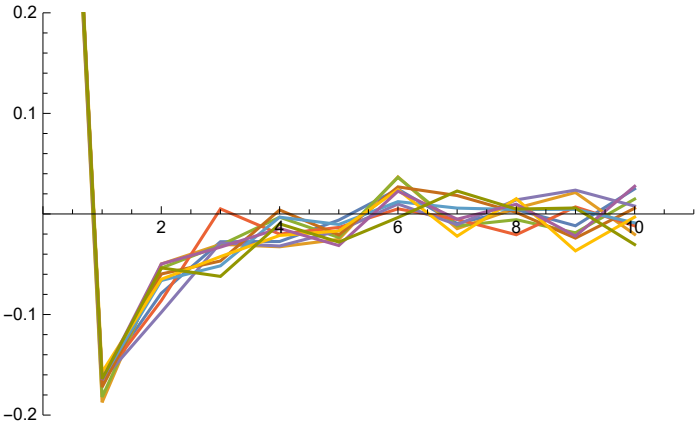
```
(*1*)
ListPlot[CorrelationFunction[returns, {10}],
 PlotRange → {{0, 11}, {-0.2, 0.2}}, Joined → True]
```



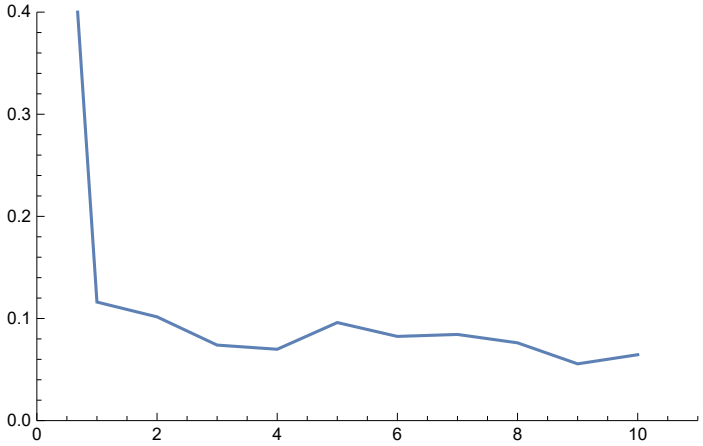

```
(*2*)
ar5Fit = TimeSeriesModelFit[returns, {"AR", {5}}];
ar5 = ar5Fit["BestFit"]
```

$$\text{ARProcess}\left[7.43668 \times 10^{-6},\ \{-0.200357, -0.112958, -0.081286, -0.0483875, -0.0366392\},\ 4.46268 \times 10^{-7}\right]$$

```
(*3*)
ListPlot[Table[CorrelationFunction[RandomFunction[ar5, {4678}], {10}], 10],
 PlotRange → {{0, 11}, {-0.2, 0.2}}, Joined → True]
```



```
(*4*)
unbiasedReturns = ar5Fit["FitResiduals"];
ListPlot[CorrelationFunction[unbiasedReturns^2, {10}],
 PlotRange → {{0, 11}, {0.0, 0.4}}, Joined → True]
```




```
(*5*)
arch5Fit = TimeSeriesModelFit[unbiasedReturns, {"ARCH", {5}}];
arch5 = arch5Fit["BestFit"]
```

$$\text{ARCHProcess}\left[2.99126 \times 10^{-7},\ \{0.0946235,\ 0.0758595,\ 0.0431533,\ 0.0414857,\ 0.0745942\}\right]$$

```
(*6*)
ListPlot[Table[CorrelationFunction[RandomFunction[arch5, {4678}]^2, {10}], 10],
 PlotRange → {{0, 11}, {0.0, 0.4}}, Joined → True]
```