Lab 2

SES algorithm

Learning Outcomes

- Using the \texttt{HoltWinters} R function to compute the SES algorithm.
- ACF and PACF

Load the \texttt{fma} package in memory by using the command line in the R console (To do at the start of each lab):

\begin{verbatim}
> require(fma)
\end{verbatim}

1. Visualise the PACF of the time series \texttt{cowtemp, usdeaths, airpass, mink} and identify the PACF (cf. question 3, section 2.3 in the lecture notes). Look at the lecture notes to learn to use the function \texttt{pacf} and \texttt{acf} displaying at least 26 lags on the x-axis. To get R help, type

\begin{verbatim}
> ? pacf
\end{verbatim}

2. HoltWinters SES. Compute the SES algorithm for the \texttt{dowjones} time series:

\begin{verbatim}
> HoltWinters(dowjones,beta=FALSE, gamma=FALSE)
\end{verbatim}

In this command above the parameter alpha (i.e. parameter $\alpha$ in SES algorithm) is chosen automatically. If you want to specify its value explicitly (e.g. $\alpha = 0.1$) then type:

\begin{verbatim}
> HoltWinters(dowjones,alpha=0.1, beta=FALSE, gamma=FALSE)
\end{verbatim}

Prediction:

\begin{verbatim}
> predict(HoltWinters(dowjones, alpha=0.1, beta=FALSE, gamma=FALSE),n.ahead=20)
\end{verbatim}

Plot the time series with its predictions

\begin{verbatim}
> ts.plot(dowjones,predict(HoltWinters(dowjones, alpha=0.1, beta=FALSE, gamma=FALSE),n.ahead=20))
\end{verbatim}

Repeat for other time series in the \texttt{fma} package.