Forecasting: Holt-Winters

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## Solutions:

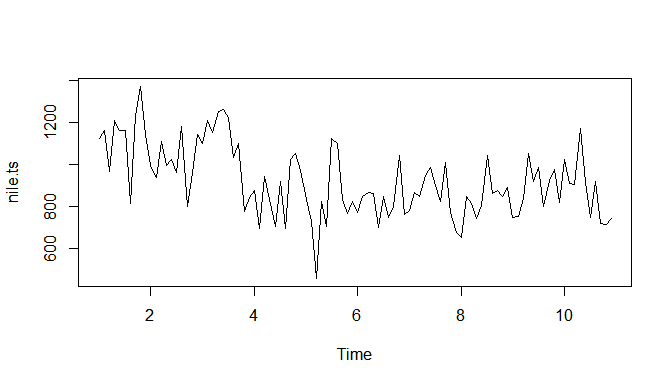
* Repeat the ts(), HoltWinters(), predict() and plot() functions on the Nile data as in these slides

We execute the R commands found in the lecture slides as follow:

# Setting up the nile data to be usable  
nile.ts<-ts(Nile,start=1,frequency=10)  
summary(nile.ts)

## Min. 1st Qu. Median Mean 3rd Qu. Max.   
## 456.0 798.5 893.5 919.4 1032.0 1370.0

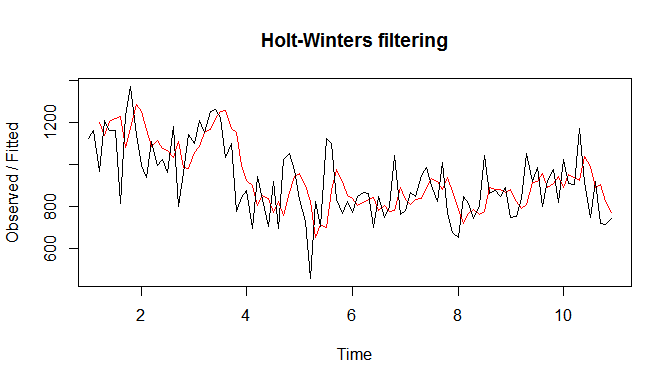
# Plotting the original data  
plot(nile.ts)



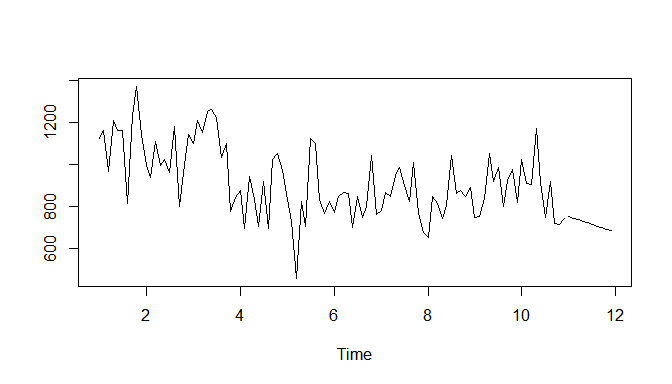
#Creating the Holt-Winters object without gamma  
nile.hw1<-HoltWinters(nile.ts,gamma = FALSE)  
nile.hw1

## Holt-Winters exponential smoothing with trend and without seasonal component.  
##   
## Call:  
## HoltWinters(x = nile.ts, gamma = FALSE)  
##   
## Smoothing parameters:  
## alpha: 0.4190643  
## beta : 0.05987705  
## gamma: FALSE  
##   
## Coefficients:  
## [,1]  
## a 756.913740  
## b -7.424597

# Plotting the Holt-Winters object  
plot(nile.hw1)



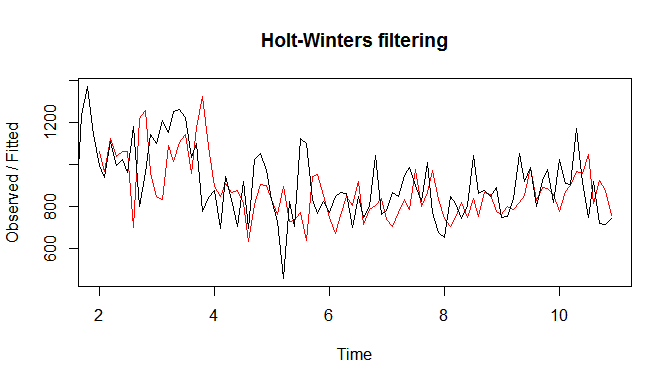
# Predicting future values with the Holt-winters Object  
nile.p1<-predict(nile.hw1, n.ahead=10)  
ts.plot(nile.ts,nile.p1)



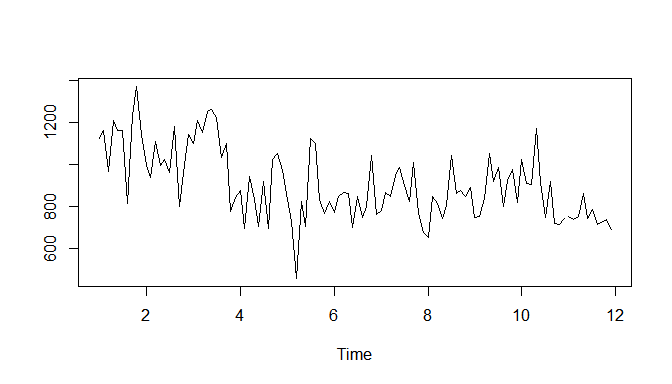
#Creating the Holt-Winters object with gamma  
nile.hw2<-HoltWinters(nile.ts)  
nile.hw2

## Holt-Winters exponential smoothing with trend and additive seasonal component.  
##   
## Call:  
## HoltWinters(x = nile.ts)  
##   
## Smoothing parameters:  
## alpha: 0.2288315  
## beta : 0.01243079  
## gamma: 0.3072457  
##   
## Coefficients:  
## [,1]  
## a 739.945079  
## b -6.201272  
## s1 17.617748  
## s2 9.950334  
## s3 27.634432  
## s4 145.943614  
## s5 34.090131  
## s6 80.026344  
## s7 18.347819  
## s8 34.150186  
## s9 50.729266  
## s10 9.567410

# Plotting the Holt-Winters object  
plot(nile.hw2)



# Predicting future values with the Holt-winters Object  
nile.p2<-predict(nile.hw2, n.ahead=10)  
ts.plot(nile.ts,nile.p2)



* Repeat the same functions with different values of alpha, beta, and gamma of your choosing on.
* AirPassengers
* EuStockMarkets
* When using the EuStockMarkets, choose one column