MTS

Diego Torres

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library(lubridate)

##   
## Attaching package: 'lubridate'

## The following object is masked from 'package:base':  
##   
## date

library(ggplot2)  
library(ggfortify)  
library(mvtnorm)  
library(forecast)  
  
  
# ctrl + shift + c para comentar varias lineas  
rm(list = ls())  
  
inpath <- "D:/Disco D/R/Datos/Series de Tiempo/CLASE 3/taller/inpath/"  
outpath <- "D:/Disco D/R/Datos/Series de Tiempo/CLASE 3/taller/outpath/"  
  
unloadNamespace("vars") # eliminar el paquete de la memoria  
library(MTS)  
  
pte\_Aranda\_F <- read.csv(paste(inpath,"pte\_aranda\_full.csv", sep = ""))  
pte\_Aranda\_F <- pte\_Aranda\_F[2:5]  
  
Temp <- ts(pte\_Aranda\_F$Temperature, start = c(2009, 1), frequency = 12)  
PM10 <- ts(pte\_Aranda\_F$PM10, start = c(2009, 1), frequency = 12)  
O3 <- ts(pte\_Aranda\_F$OZONO, start = c(2009, 1), frequency = 12)  
NO2 <- ts(pte\_Aranda\_F$NO2, start = c(2009, 1), frequency = 12)  
multi <- cbind(Temp, PM10, O3, NO2)  
  
#### VAR(2) ####  
#var2 <- VAR(multi, p = 2, type = "both", season = 12)  
var2MTS <- VAR(multi, 2)

## Constant term:   
## Estimates: 3.695923 38.8721 14.20752 19.79154   
## Std.Error: 0.920282 20.1876 5.067112 10.23577   
## AR coefficient matrix   
## AR( 1 )-matrix   
## [,1] [,2] [,3] [,4]  
## [1,] 0.731 0.000128 0.0195 0.0111  
## [2,] -0.376 0.646834 0.8305 0.0779  
## [3,] -1.311 0.022140 0.6905 -0.0709  
## [4,] 0.130 0.060324 0.4787 0.5767  
## standard error   
## [,1] [,2] [,3] [,4]  
## [1,] 0.0968 0.00464 0.0165 0.00854  
## [2,] 2.1229 0.10169 0.3618 0.18733  
## [3,] 0.5329 0.02552 0.0908 0.04702  
## [4,] 1.0764 0.05156 0.1835 0.09498  
## AR( 2 )-matrix   
## [,1] [,2] [,3] [,4]  
## [1,] -0.00388 -0.000298 0.0107 -0.0136  
## [2,] -1.69508 -0.011683 -0.1451 0.1050  
## [3,] 0.48273 0.008368 -0.0687 0.0256  
## [4,] -1.09009 -0.052561 -0.3253 0.0194  
## standard error   
## [,1] [,2] [,3] [,4]  
## [1,] 0.0989 0.00458 0.0163 0.0086  
## [2,] 2.1694 0.10047 0.3582 0.1886  
## [3,] 0.5445 0.02522 0.0899 0.0473  
## [4,] 1.1000 0.05094 0.1816 0.0956  
##   
## Residuals cov-mtx:   
## [,1] [,2] [,3] [,4]  
## [1,] 0.1362439 0.9658488 0.2157870 0.2075393  
## [2,] 0.9658488 65.5608520 2.5887284 12.2003550  
## [3,] 0.2157870 2.5887284 4.1304398 0.7880102  
## [4,] 0.2075393 12.2003550 0.7880102 16.8545261  
##   
## det(SSE) = 439.0185   
## AIC = 6.56939   
## BIC = 7.268251   
## HQ = 6.853375

rm(list = ls())  
  
library(dplyr)

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:lubridate':  
##   
## intersect, setdiff, union

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

library(lubridate)  
library(ggplot2)  
library(ggpubr)

## Loading required package: magrittr

##   
## Attaching package: 'ggpubr'

## The following object is masked from 'package:forecast':  
##   
## gghistogram

library(corrplot)

## corrplot 0.84 loaded

library(tseries)  
library(ggfortify)  
library(TSA)

##   
## Attaching package: 'TSA'

## The following objects are masked from 'package:stats':  
##   
## acf, arima

## The following object is masked from 'package:utils':  
##   
## tar

#library(MTS)  
library(mvtnorm)  
library(forecast)  
  
inpath <- "D:/Disco D/R/Datos/Series de Tiempo/CLASE 3/taller/inpath/"  
outpath <- "D:/Disco D/R/Datos/Series de Tiempo/CLASE 3/taller/outpath/"  
  
  
pte\_Aranda <- read.csv(paste(inpath,"PteAranda\_mensual.csv", sep = ""))  
pte\_Aranda$DateTime <- ymd(pte\_Aranda$DateTime)  
pte\_Aranda$Month <- as.factor(month(pte\_Aranda$DateTime))  
  
Te <- ggplot(pte\_Aranda, aes(x = Month, y = Temperature)) +   
 stat\_boxplot(geom = "errorbar") +  
 geom\_boxplot(fill = "gray96", size = .6, outlier.size = 1., outlier.color = "gray40") +   
 xlab(NULL) +  
 ylab(parse(text = "Temperature ~~ group('(', degree \* C, ')')")) +   
 theme(axis.text.x = element\_text(angle = 90)) +   
 theme(plot.title = element\_text(hjust = 0.5)) +   
 theme\_bw() + theme\_light() +   
 theme(axis.line = element\_line(colour = "gray40",   
 size = .5, linetype = "solid"))   
  
  
PM10 <- ggplot(pte\_Aranda, aes(x = Month, y = PM10)) +   
 stat\_boxplot(geom = "errorbar") +  
 geom\_boxplot(fill = "gray96", size = .6, outlier.size = 1., outlier.color = "gray40") +   
 xlab(NULL) +  
 ylab(expression("PM10"~"("\*mu\*g/m^3\*")"))+   
 theme(axis.text.x = element\_text(angle = 90)) +   
 theme(plot.title = element\_text(hjust = 0.5)) +   
 theme\_bw() + theme\_light() +   
 theme(axis.line = element\_line(colour = "gray40",   
 size = .5, linetype = "solid"))   
  
  
O3 <- ggplot(pte\_Aranda, aes(x = Month, y = OZONO)) +   
 stat\_boxplot(geom = "errorbar") +  
 geom\_boxplot(fill = "gray96", size = .6, outlier.size = 1., outlier.color = "gray40") +   
 scale\_x\_discrete(name="Meses", labels = c("", "Febr", "", "",   
 "May", "", "", "Aug",   
 "", "", "Nov", "")) +   
 ylab("O3 (ppb)")+   
 theme(axis.text.x = element\_text(angle = 0)) +   
 theme(plot.title = element\_text(hjust = 0.5)) +   
 theme\_bw() + theme\_light() +   
 theme(axis.line = element\_line(colour = "gray40",   
 size = .5, linetype = "solid"))  
  
  
NO2 <- ggplot(pte\_Aranda, aes(x = Month, y = NO2)) +   
 stat\_boxplot(geom = "errorbar") +  
 geom\_boxplot(fill = "gray96", size = .6, outlier.size = 1., outlier.color = "gray40") +   
 scale\_x\_discrete(name="Meses", labels = c("", "Febr", "", "",   
 "May", "", "", "Aug",   
 "", "", "Nov", "")) +   
 ylab("NO2 (ppb)")+   
 theme(axis.text.x = element\_text(angle = 0)) +   
 theme(plot.title = element\_text(hjust = 0.5)) +   
 theme\_bw() + theme\_light() +   
 theme(axis.line = element\_line(colour = "gray40",   
 size = .5, linetype = "solid"))  
  
  
guay <- ggarrange(Te + rremove("x.text"), PM10 + rremove("x.text"),O3, NO2,   
 labels = c("A", "B", "C", "D"),  
 ncol = 2, nrow = 2)

## Warning: Removed 6 rows containing non-finite values (stat\_boxplot).  
  
## Warning: Removed 6 rows containing non-finite values (stat\_boxplot).

## Warning: Removed 20 rows containing non-finite values (stat\_boxplot).  
  
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annotate\_figure(guay)

