# R-Code Decomposition Models

CBE <- read.table("C:/MA\_TS/R/cbe.dat", header = T)

CBE[1:4, ]

class(CBE)

Elec.ts <- ts(CBE[, 3], start = 1958, freq =12)

Beer.ts <- ts(CBE[, 2], start = 1958, freq =12)

Choc.ts <- ts(CBE[, 1], start = 1958, freq =12)

plot(cbind(Elec.ts, Beer.ts, Choc.ts))

##--------------------------------------------------------------------------

plot(decompose(Elec.ts))

Elec.decom <- decompose(Elec.ts, type = "mult")

plot(Elec.decom)

Trend <- Elec.decom$trend

Seasonal <- Elec.decom$seasonal

ts.plot(cbind(Trend, Trend\*Seasonal), lty = 1:2)

Elec.ts

Trend

Seasonal

##--------------------------------------------------------------------------

data(AirPassengers)

AP <- AirPassengers

plot(decompose(AP))

AP.decom <- decompose(AP, type = "multiplicative")

plot(AP.decom)

plot(ts(AP.decom$random[7:138]))

acf(AP.decom$random[7:138])

sd(AP[7:138])

sd(AP[7:138]-(AP.decom$trend[7:138]\*AP.decom$seasonal[7:138]))

## ------------------------------------------------------------------------

library(FinTS)

data(q.jnj)

## ------------------------------------------------------------------------

class(q.jnj)

## ------------------------------------------------------------------------

plot(q.jnj)

## ------------------------------------------------------------------------

q.jnjts=as.ts(q.jnj)

class(q.jnjts)

plot(q.jnjts)

head(q.jnjts)

start(q.jnjts)

## ------------------------------------------------------------------------

jnjda=decompose(q.jnjts,type='additive')

jnjda$trend

jnjda$seasonal

jnjda$random

## ------------------------------------------------------------------------

str(jnjda)

## ------------------------------------------------------------------------

plot(q.jnjts)

plot(jnjda$trend)

plot(jnjda$seasonal)

plot(jnjda$random)

## ------------------------------------------------------------------------

predda=jnjda$trend+jnjda$seasonal

## ------------------------------------------------------------------------

layout(1:1)

plot(q.jnj,lwd=2)

lines(predda,col='red',lwd=2)

## ------------------------------------------------------------------------

jnjdaresid=window(jnjda$random, start=c(1960,3), end=c(1980,2))

rmseda=sqrt(sum(jnjdaresid^2)/length(jnjdaresid))

rmseda

## ------------------------------------------------------------------------

jnjdm=decompose(q.jnjts,type='multiplicative')

## ------------------------------------------------------------------------

plot(jnjdm$trend)

plot(jnjdm$seasonal)

plot(jnjdm$random)

## ------------------------------------------------------------------------

preddm=jnjdm$trend\*jnjdm$seasonal

resid=q.jnjts-preddm

jnjdmresid=window(resid, start=c(1960,3), end=c(1980,2))

rmsedm=sqrt(sum(jnjdmresid^2)/length(jnjdmresid))

rmsedm

## ------------------------------------------------------------------------

layout(1:1)

plot(q.jnj,lwd=2)

lines(preddm,col='red',lwd=2)

## ------------------------------------------------------------------------

plot(jnjdm$random)

plot(jnjdmresid)