

pkb.Rmd.R

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```
library(tidyverse, quietly = T)

## -- Attaching packages ----- tidyverse 1.2.1 --

## v ggplot2 3.2.1      v purrr  0.3.3
## v tibble  2.1.3      v dplyr  0.8.4
## v tidyr   1.0.2      v stringr 1.4.0
## v readr   1.3.1      v forcats 0.4.0

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

pkb = readRDS("data/pkb.rds")
dane = spread(pkb[,1:3], key = mm, value=gdp )
cbind(1993:2019, apply(dane[, -1], 1, which.max))

##      [,1] [,2]
## [1,] 1993    4
## [2,] 1994    4
## [3,] 1995    4
## [4,] 1996    3
## [5,] 1997    3
## [6,] 1998    3
## [7,] 1999    3
## [8,] 2000    3
## [9,] 2001    4
## [10,] 2002   4
## [11,] 2003   4
## [12,] 2004   4
## [13,] 2005   4
## [14,] 2006   4
## [15,] 2007   4
## [16,] 2008   4
## [17,] 2009   4
## [18,] 2010   4
## [19,] 2011   4
## [20,] 2012   4
## [21,] 2013   4
## [22,] 2014   4
## [23,] 2015   4
## [24,] 2016   4
## [25,] 2017   4
## [26,] 2018   4
## [27,] 2019   4

pkb2 = pkb
pkb2$mm = pkb2$yy + (1/4*1:4-0.15)
head(pkb2)
```

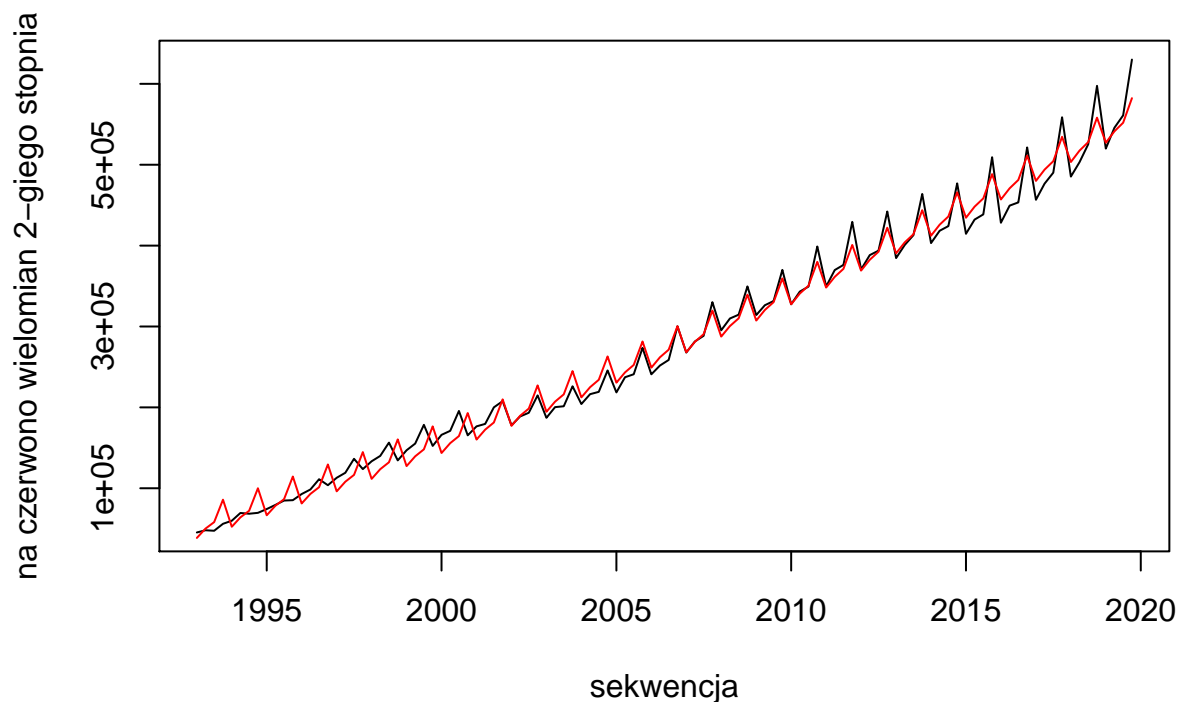
```
## # A tibble: 6 x 3
##   yy    mm    gdp
##   <dbl> <dbl> <dbl>
## 1  1993 1993. 45366.
## 2  1993 1993. 48078.
## 3  1993 1994. 47478.
## 4  1993 1994. 56081.
## 5  1994 1994. 59861.
## 6  1994 1994. 69447.

pkb2$mm2 = 1:4
model = lm(gdp~mm+I(mm^2)+as.factor(mm2), data=pkb2)

sekwencja = seq.Date(as.Date("1993-01-01"), as.Date("2019-12-31"), by = "quarter")

plot(sekwencja, pkb2$gdp, type= 'l',
     main = 'wydaje mi sie, ze jest przesuniecie 1996-2001',
     ylab = 'na czerwono wielomian 2-giego stopnia')
lines(sekwencja, predict(model), col='red')
```

wydaje mi sie, ze jest przesuniecie 1996–2001



```
#
library(forecast)

## Registered S3 method overwritten by 'xts':
##   method      from
##   as.zoo.xts zoo

## Registered S3 method overwritten by 'quantmod':
##   method      from
##   as.zoo.data.frame zoo

## Registered S3 methods overwritten by 'forecast':
```

```
## method          from
## fitted.fracdiff fracdiff
## residuals.fracdiff fracdiff

trend_pkb = ma(pkb2, order = 4, centre = T)
pkb2 = ts(pkb$gdp/1000, frequency = 4, start = c(1993,1), end = c(2019,4))
decompose_pkb = decompose(pkb2, "additive")
plot(decompose_pkb)
```

Decomposition of additive time series

