Boosting_Contiguity_Queen_PDRB

Anandika Dian P.

3/29/2020

```
#Contiguity queen dengan ordo [1:3]
#Matriks PDRB selisih terstandardisasi (nonsimetris)
```

```
start.time <- Sys.time()
library(spdep)
```

```
## Loading required package: sp
```

```
## Loading required package: spData
```

```
## To access larger datasets in this package, install the spDataLarge
## package with: `install.packages('spDataLarge',
## repos='https://nowosad.github.io/drat/', type='source')`
```

```
## Loading required package: sf
```

```
## Linking to GEOS 3.6.1, GDAL 2.2.3, PROJ 4.9.3
```

```
dataIGI <- read.csv("D:/Skripsweet/data_jateng_w_latlong.csv")
rownames(dataIGI) <- dataIGI$KABUPATEN
attach(dataIGI)
vy <- IGI
vx <- dataIGI[,4:8]
coords <- cbind(x_long,y_lat)
detach(dataIGI)
```

```
PDRB <- read.csv("D:/Skripsweet/Kak Along's/matriks_PDRB_Berlaku_inverse.csv")
w_PDRB <- as.matrix(PDRB)
```

```
library(rgdal)
```

```
## rgdal: version: 1.4-3, (SVN revision 828)
##  Geospatial Data Abstraction Library extensions to R successfully loaded
##  Loaded GDAL runtime: GDAL 2.2.3, released 2017/11/20
##  Path to GDAL shared files: C:/Program Files/R/R-3.6.2/library/rgdal/gdal
##  GDAL binary built with GEOS: TRUE
##  Loaded PROJ.4 runtime: Rel. 4.9.3, 15 August 2016, [PJ_VERSION: 493]
##  Path to PROJ.4 shared files: C:/Program Files/R/R-3.6.2/library/rgdal/proj
##  Linking to sp version: 1.3-1
```

```
jt_lp<-readOGR("D:/KULIAH STIS/Tingkat 3/Semester 6/SIG/UAS SIG","Jawa_Tengah")
```

```
## OGR data source with driver: ESRI Shapefile
## Source: "D:\KULIAH STIS\Tingkat 3\Semester 6\SIG\UAS SIG", layer: "Jawa_Tengah"
## with 35 features
## It has 6 fields
```

```r
get.list=function(coords,k)
{
  #membuat ketetanggaan contuiguity queen
  nb<-poly2nb(jt_lp,queen = TRUE)
  nb_1<-nblag(nb,k)
  nb_cum<-nblag_cumul(nb_1)
  w_queen<-nb2listw(nb_cum,style = "B")
  #mengembalikan ke bentuk matriks
  w_queen <- listw2mat(w_queen)
  #mengalikan matriks knn dengan PDRB
  m_cust <- w_PDRB*w_queen
  m_cust_tot<-rowSums(m_cust,na.rm = TRUE)
  m_custom<-m_cust/m_cust_tot
  #mengubah ke bentuk listw
  w_custom <- mat2listw(m_custom)
}
```

```r
create.instr=function(vy,vx,w_custom){
  ly <- lag.listw(w_custom,vy)
  res <- matrix(data = NA, nrow = nrow(vx), ncol = ncol(vx))
  for (i in 1:ncol(vx))
  {
    res[ ,i]=  lag.listw(w_custom,vx[,i])
  }
  instr=lm(ly~ res)$fitted.values
  instr
}
```

```r
#membuat ketetanggaan contuiguity queen
nb<-poly2nb(jt_lp,queen = TRUE)
w_q1<-nb2listw(nb,style = "B")
#mengembalikan ke bentuk matriks
w_q1 <- listw2mat(w_q1)
#mengalikan matriks knn dengan PDRB
m_cust_1 <- w_PDRB*w_q1
m_cust_1_tot<-rowSums(m_cust_1,na.rm = TRUE)
m_custom_1<-m_cust_1/m_cust_1_tot
#mengubah ke bentuk listw
w_custom_1 <- mat2listw(m_custom_1)
s9_o1<-create.instr(vy,vx,w_custom_1)
```

```r
degs <- c(2,3)
res<-matrix(NA,length(vy),length(degs))
X <- vx
for(i in 1:length(degs))
  {
  #a untuk membentuk matriks pembobot
  a <- get.list(coords,k=degs[[i]])
  #menghitung fitted values model pada masing2 matriks pembobot
  b <- create.instr(vy,vx,a)
  names(b)=NULL
  res[,i]=b
}
  mn <- paste("s9_o",degs,sep="")
  res <- data.frame(res)
  names(res)<- mn
  res<-cbind(s9_o1,res)
  res<- as.matrix(res)
  X <- cbind(X,res)
  #X <- res
```

```
X1<-X[,-(1:5)]
n = nrow(X1)
#jumlah kombinasi matriks pembobot
#X berisi matriks dengan baris berupa wilayah dan kolom berupa macam2 matriks pembobot dengan elemen ma

save(X1,vy,n, file="d:/Skripsweet/Bimbingan 10/IGI_jateng.w9.Rdata")

load("d:/Skripsweet/Bimbingan 10/IGI_jateng.w9.Rdata")
jateng_w<-get(load("d:/Skripsweet/Bimbingan 10/IGI_jateng.w9.Rdata"))
jat_w_mat<-as.matrix(jateng_w)
```

```
library(mboost)
```

```
## Loading required package: parallel
```

```
## Loading required package: stabs
```

```
## This is mboost 2.9-1. See 'package?mboost' and 'news(package  = "mboost")'
## for a complete list of changes.
```

```
#v 0.1
m1=glmboost(jat_w_mat,vy,control = boost_control(mstop = 1000,nu=0.1),center = FALSE)
```

```
aic1 <- AIC(m1,method="corrected")
aic1
```

```
## [1] -0.5637055
## Optimal number of boosting iterations: 1
## Degrees of freedom (for mstop = 1): 0.1
```

```
mbest1aic=m1[mstop(aic1)]
names(coef(mbest1aic)[abs(coef(mbest1aic)) > 0])
```

```
## [1] "s9_o2"
```

```r
gMDL1 <- AIC(m1,method="gMDL")
gMDL1
```

```
## [1] -1.596574
## Optimal number of boosting iterations: 1
## Degrees of freedom (for mstop = 1): 0.1
```

```r
mbest1gMDL=m1[mstop(gMDL1)]
names(coef(mbest1gMDL)[abs(coef(mbest1gMDL)) > 0])
```

```
## [1] "s9_o2"
```

```r
end.time <- Sys.time()
time.taken <- end.time - start.time
time.taken
```

```
## Time difference of 9.93249 secs
```

```r
nb<-poly2nb(jt_lp,queen = TRUE)
nb_1<-nblag(nb,2)
nb_cum<-nblag_cumul(nb_1)
w_queen<-nb2listw(nb_cum,style = "B")
#mengembalikan ke bentuk matriks
w_queen <- listw2mat(w_queen)
#mengalikan matriks knn dengan PDRB
m_cust <- w_PDRB*w_queen
m_cust_tot<-rowSums(m_cust,na.rm = TRUE)
m_custom<-m_cust/m_cust_tot
#mengubah ke bentuk listw
w_final <- mat2listw(m_custom,style = "W")
```

```r
moran.test(dataIGI$IGI,w_final,randomisation = TRUE)
```

```
##
##  Moran I test under randomisation
##
## data:  dataIGI$IGI
## weights: w_final
##
## Moran I statistic standard deviate = 2.8048, p-value = 0.002517
## alternative hypothesis: greater
## sample estimates:
## Moran I statistic       Expectation          Variance
##        0.27455493       -0.02941176        0.01174478
```

```r
my<- dataIGI$IGI
mx<-cbind(dataIGI$INFLASI,dataIGI$PMTB,dataIGI$UMK,dataIGI$PP,dataIGI$PPS)
ols<-lm(my~mx)
moran.test(ols$residuals,w_final,randomisation = TRUE)
```

```
##
##  Moran I test under randomisation
##
## data:  ols$residuals
## weights: w_final
##
## Moran I statistic standard deviate = 0.31427, p-value = 0.3767
## alternative hypothesis: greater
## sample estimates:
## Moran I statistic       Expectation          Variance
##       0.004240576      -0.029411765       0.011466346
```

```
r.ols <- lm(dataIGI$IGI ~ dataIGI$INFLASI+dataIGI$PMTB+dataIGI$UMK+dataIGI$PPS+dataIGI$PP)
r.lag <- lagsarlm(r.ols, dataIGI, w_final, zero.policy = TRUE)
```

```
## Warning: Function lagsarlm moved to the spatialreg package
```

```
## Registered S3 methods overwritten by 'spatialreg':
##   method                   from
##   residuals.stsls          spdep
##   deviance.stsls           spdep
##   coef.stsls               spdep
##   print.stsls              spdep
##   summary.stsls            spdep
##   print.summary.stsls      spdep
##   residuals.gmsar          spdep
##   deviance.gmsar           spdep
##   coef.gmsar               spdep
##   fitted.gmsar             spdep
##   print.gmsar              spdep
##   summary.gmsar            spdep
##   print.summary.gmsar      spdep
##   print.lagmess            spdep
##   summary.lagmess          spdep
##   print.summary.lagmess    spdep
##   residuals.lagmess        spdep
##   deviance.lagmess         spdep
##   coef.lagmess             spdep
##   fitted.lagmess           spdep
##   logLik.lagmess           spdep
##   fitted.SFResult          spdep
##   print.SFResult           spdep
##   fitted.ME_res            spdep
##   print.ME_res             spdep
##   print.lagImpact          spdep
##   plot.lagImpact           spdep
##   summary.lagImpact        spdep
##   HPDinterval.lagImpact    spdep
##   print.summary.lagImpact  spdep
##   print.sarlm              spdep
##   summary.sarlm            spdep
##   residuals.sarlm          spdep
##   deviance.sarlm           spdep
##   coef.sarlm               spdep
##   vcov.sarlm               spdep
##   fitted.sarlm             spdep
##   logLik.sarlm             spdep
##   anova.sarlm              spdep
##   predict.sarlm            spdep
##   print.summary.sarlm      spdep
##   print.sarlm.pred         spdep
##   as.data.frame.sarlm.pred spdep
##   residuals.spautolm       spdep
##   deviance.spautolm        spdep
##   coef.spautolm            spdep
##   fitted.spautolm          spdep
##   print.spautolm           spdep
##   summary.spautolm         spdep
##   logLik.spautolm          spdep
##   print.summary.spautolm   spdep
##   print.WXImpact           spdep
##   summary.WXImpact         spdep
##   print.summary.WXImpact   spdep
##   predict.SLX              spdep
```

```
summary(r.lag, Nagelkerke = TRUE)
```

```
##
## Call:spatialreg::lagsarlm(formula = formula, data = data, listw = listw,
##     na.action = na.action, Durbin = Durbin, type = type, method = method,
##     quiet = quiet, zero.policy = zero.policy, interval = interval,
##     tol.solve = tol.solve, trs = trs, control = control)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.946444 -0.206266  0.026239  0.233160  0.518242
##
## Type: lag
## Coefficients: (asymptotic standard errors)
##                    Estimate Std. Error z value  Pr(>|z|)
## (Intercept)       5.3592385  1.2100259  4.4290 9.466e-06
## dataIGI$INFLASI  -0.2027221  0.1190475 -1.7029  0.088593
## dataIGI$PMTB      0.0104908  0.0046015  2.2799  0.022616
## dataIGI$UMK      -0.0850574  0.0385789 -2.2048  0.027471
## dataIGI$PPS       0.3369398  0.1124996  2.9950  0.002744
## dataIGI$PP       -0.0041595  0.0062591 -0.6646  0.506337
##
## Rho: 0.2906, LR test value: 2.3002, p-value: 0.12936
## Asymptotic standard error: 0.18212
##     z-value: 1.5957, p-value: 0.11056
## Wald statistic: 2.5461, p-value: 0.11056
##
## Log likelihood: -7.757044 for lag model
## ML residual variance (sigma squared): 0.089448, (sigma: 0.29908)
## Nagelkerke pseudo-R-squared: 0.53426
## Number of observations: 35
## Number of parameters estimated: 8
## AIC: 31.514, (AIC for lm: 31.814)
## LM test for residual autocorrelation
## test value: 7.5212, p-value: 0.0060978
```

```
W <- as(w_final, "CsparseMatrix")
trMatc <- trW(W, type = "mult")
```

```
## Warning: Function trW moved to the spatialreg package
```

```
set.seed(1)
summary(impacts(r.lag, tr=trMatc, R = 99), zstats = TRUE, short = TRUE)
```

```
## Warning: Method impacts.sarlm moved to the spatialreg package
```

```
## Impact measures (lag, trace):
##                       Direct     Indirect        Total
## dataIGI$INFLASI -0.206855994 -0.078909712 -0.285765706
## dataIGI$PMTB     0.010704777  0.004083570  0.014788347
## dataIGI$UMK     -0.086791860 -0.033108640 -0.119900500
## dataIGI$PPS      0.343810641  0.131154037  0.474964678
## dataIGI$PP      -0.004244292 -0.001619077 -0.005863369
## ========================================================
## Simulation results (asymptotic variance matrix):
## ========================================================
## Simulated standard errors
##                      Direct    Indirect       Total
## dataIGI$INFLASI 0.117755888 0.076793622 0.164703712
## dataIGI$PMTB    0.004755555 0.003966524 0.007386037
## dataIGI$UMK     0.039260648 0.039564817 0.069597962
## dataIGI$PPS     0.124680916 0.113317164 0.199513137
## dataIGI$PP      0.006376172 0.003547912 0.009241379
##
## Simulated z-values:
##                     Direct   Indirect     Total
## dataIGI$INFLASI -1.8490207 -1.0392938 -1.806542
## dataIGI$PMTB     2.1264171  0.9776297  1.894126
## dataIGI$UMK     -2.2079703 -0.9159733 -1.766239
## dataIGI$PPS      2.7312926  1.2033469  2.390318
## dataIGI$PP      -0.6186573 -0.5510034 -0.638387
##
## Simulated p-values:
##                 Direct    Indirect Total
## dataIGI$INFLASI 0.0644548 0.29867  0.070834
## dataIGI$PMTB    0.0334685 0.32826  0.058208
## dataIGI$UMK     0.0272463 0.35968  0.077356
## dataIGI$PPS     0.0063086 0.22884  0.016834
## dataIGI$PP      0.5361421 0.58163  0.523222
```