Untitled

2023-12-10

```
library(raster)
```

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

```
library(spdep)
```

```
## 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 3.8.0, GDAL 3.0.4, PROJ 6.3.1; sf_use_s2() is TRUE
```

```
library(sp)
library(readxl)
library(openxlsx)
library(sf)
library(corrplot)
```

```
## corrplot 0.92 loaded
```

```
library(DescTools)
library(nortest)
library(car)
```

```
## Loading required package: carData
```

```
##
## Attaching package: 'car'
```

```
## The following object is masked from 'package:DescTools':
##
##     Recode
```

```
library(spatialreg)
```

```
## Loading required package: Matrix
```

```
##
## Attaching package: 'spatialreg'
```

```
## The following objects are masked from 'package:spdep':
##
##     get.ClusterOption, get.coresOption, get.mcOption,
##     get.VerboseOption, get.ZeroPolicyOption, set.ClusterOption,
##     set.coresOption, set.mcOption, set.VerboseOption,
##     set.ZeroPolicyOption
```

```r
data <- read_excel("Soal Ujian 2023.xlsx", sheet = "Variabel")
```

```
## New names:
## * `` -> `...15`
## * `` -> `...16`
## * `` -> `...17`
## * `` -> `...18`
## * `` -> `...19`
## * `` -> `...20`
## * `` -> `...21`
## * `` -> `...22`
## * `` -> `...23`
## * `` -> `...24`
## * `` -> `...25`
## * `` -> `...26`
## * `` -> `...27`
## * `` -> `...28`
## * `` -> `...29`
## * `` -> `...30`
## * `` -> `...31`
## * `` -> `...32`
## * `` -> `...33`
## * `` -> `...34`
## * `` -> `...35`
## * `` -> `...36`
## * `` -> `...37`
## * `` -> `...38`
## * `` -> `...39`
## * `` -> `...40`
## * `` -> `...41`
## * `` -> `...42`
## * `` -> `...43`
## * `` -> `...44`
## * `` -> `...45`
## * `` -> `...46`
## * `` -> `...47`
## * `` -> `...48`
## * `` -> `...49`
## * `` -> `...50`
## * `` -> `...51`
## * `` -> `...52`
## * `` -> `...53`
## * `` -> `...54`
## * `` -> `...55`
## * `` -> `...56`
## * `` -> `...57`
## * `` -> `...58`
## * `` -> `...59`
## * `` -> `...60`
## * `` -> `...61`
## * `` -> `...62`
## * `` -> `...63`
```

```r
data <- as.data.frame(data)
head(data)
```

```
##         Kabupaten Kota'   ID Diare 2022 DBD 2022 TBC  2022
## 1       Kabupaten Bogor 3201      91434     2220     12153
## 2    Kabupaten Sukabumi 3202      62891      272      4828
## 3     Kabupaten Cianjur 3203      18179      430      4746
## 4     Kabupaten Bandung 3204      12893     2026      5839
## 5       Kabupaten Garut 3205      28764     1011      4855
## 6 Kabupaten Tasikmalaya 3206       9686       48      2130
##   Jumlah Penduduk Prasejahtera Jumlah Penduduk Kepadatan Penduduk
## 1                        88679         5084644               2025
## 2                        56056         2617249                666
## 3                        50964         2412287                653
## 4                        68045         3307884               2074
## 5                        52282         2746239                847
## 6                        33070         1725914                738
##   Pendapatan Formal Pendapatan Informal Ketinggian Lokasi
## 1           3514172             2030305            129.41
## 2           2524716             1890323             15.55
## 3           2211153             1413799            454.66
## 4           3000425             2046094            728.01
## 5           2066635             1577196            758.92
## 6           2056863             1258220            411.40
##   Jumlah Tenaga Kesehatan Jumlah RS Jumlah Puskesmas ...15 ...16 ...17 ...18
## 1                    1958        26              109    NA    NA    NA    NA
## 2                     578         7               60    NA    NA    NA    NA
## 3                     526         5               47    NA    NA    NA    NA
## 4                    1072        10               63    NA    NA    NA    NA
## 5                     476         9               68    NA    NA    NA    NA
## 6                     197         6               40    NA    NA    NA    NA
##   ...19 ...20 ...21 ...22 ...23 ...24 ...25 ...26 ...27 ...28 ...29 ...30 ...31
## 1    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 2    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 3    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 4    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 5    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 6    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
##   ...32 ...33 ...34 ...35 ...36 ...37 ...38 ...39 ...40 ...41 ...42 ...43 ...44
## 1    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 2    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 3    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 4    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 5    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 6    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
##   ...45 ...46 ...47 ...48 ...49 ...50 ...51 ...52 ...53 ...54 ...55 ...56 ...57
## 1    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 2    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 3    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 4    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 5    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## 6    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
##   ...58 ...59 ...60 ...61 ...62 ...63
## 1    NA    NA    NA    NA    NA    NA
```

```
## 2    NA    NA    NA    NA    NA    NA
## 3    NA    NA    NA    NA    NA    NA
## 4    NA    NA    NA    NA    NA    NA
## 5    NA    NA    NA    NA    NA    NA
## 6    NA    NA    NA    NA    NA    NA
```

```
data <- data[1:27,]
data <- data[, 1:14]
colnames(data) <- c("KabKot", "ID", "Y1", "Y2", "Y3", "X1", "X2", "X3", "X4", "X5", "X6", "X7", "X8", "X
data
```

```
##                     KabKot   ID    Y1   Y2    Y3    X1      X2    X3      X4
## 1           Kabupaten Bogor 3201 91434 2220 12153 88679 5084644  2025 3514172
## 2        Kabupaten Sukabumi 3202 62891  272  4828 56056 2617249   666 2524716
## 3         Kabupaten Cianjur 3203 18179  430  4746 50964 2412287   653 2211153
## 4         Kabupaten Bandung 3204 12893 2026  5839 68045 3307884  2074 3000425
## 5           Kabupaten Garut 3205 28764 1011  4855 52282 2746239   847 2066635
## 6     Kabupaten Tasikmalaya 3206  9686   48  2130 33070 1725914   738 2056863
## 7           Kabupaten Ciamis 3207 20250  470  1664 15613 1268223   875 1935748
## 8        Kabupaten Kuningan 3208 12455  544  1726 14633 1211761  1063 2075760
## 9         Kabupaten Cirebon 3209 30706  819  3472 50696 2139272  2327 2123711
## 10     Kabupaten Majalengka 3210 14495  447  1744 20520 1317862  1095 2114662
## 11       Kabupaten Sumedang 3211 13268 1264  1426 12159 1189568   764 2529518
## 12      Kabupaten Indramayu 3212 14437  188  1754 46227 1653777   907 2539700
## 13         Kabupaten Subang 3213 17415  287  2991 30222 1533967   849 2876785
## 14     Kabupaten Purwakarta 3214 19472  220  2417 15386  951582  1225 3560596
## 15       Kabupaten Karawang 3215 16777  929  4660 57105 2102386  1494 3845039
## 16         Kabupaten Bekasi 3216 15001  370  4867 59569 2924944  2578 4532121
## 17 Kabupaten Bandung Barat 3217 11184  419  1771 30314 1711596  1389 3064555
## 18   Kabupaten Pangandaran 3218  2613   79   421  6154  405435   423 1897628
## 19               Kota Bogor 3271  5391  526  4677 11855  833838  8881 4628945
## 20           Kota Sukabumi 3272  5464  449  1496  4118  317930  7271 2936799
## 21            Kota Bandung 3273 17180 3743  9165 27269 1964815 14630 3487569
## 22            Kota Cirebon 3274  8563  166  1966  3952  292052  9017 2941185
## 23             Kota Bekasi 3275  9980 1844  6134 19694 1175929 12414 5279675
## 24              Kota Depok 3276 10170 3155  4142 17718 1231274 10415 4979902
## 25             Kota Cimahi 3277  1115  590  1763  5515  513930 14556 3898964
## 26        Kota Tasikmalaya 3278  9123  909  1520 10613  700404  4218 2265694
## 27             Kota Banjar 3279  2053   29   274  2142  209845  1792 2303102
##         X5     X6   X7 X8  X9
## 1  2030305 129.41 1958 26 109
## 2  1890323  15.55  578  7  60
## 3  1413799 454.66  526  5  47
## 4  2046094 728.01 1072 10  63
## 5  1577196 758.92  476  9  68
## 6  1258220 411.40  197  6  40
## 7  1379048 207.99  220  5  36
## 8  1585507 533.74  390 11  38
## 9  1835970  76.77  740 12  63
## 10 1518006 130.79  362  5  32
## 11 1601751 462.75  522  3  35
## 12 1901275   2.08  418 11  49
## 13 1948730  96.20  397  7  40
## 14 1957779  84.98  496  9  20
## 15 2334853  17.95 1084 20  51
```

```
## 16 2404396  66.47 1807 40  50
## 17 1775068 789.56  500  7  33
## 18 1367906   6.96  105  1  15
## 19 2493000 255.73 1272 21  24
## 20 2012715 622.65  356  6  15
## 21 2325257 716.63 4571 28  71
## 22 1849590   4.66  591 11  21
## 23 3014772  20.09 2211 27  43
## 24 2895486  87.80 1898 17  37
## 25 2275948 794.36  706  5  12
## 26 1727815 382.95  385  8  23
## 27 1397678  36.00  135  4  10
```

```
# Menghilangkan peubah ID dan KabKot serta melakukan scaling
data.2 = data[,-c(1,2)]
data.2 = scale(data.2)
data.scaling = data.frame(data$KabKot, data$ID, data.2)
head(data.scaling)
```

```
##             data.KabKot data.ID          Y1         Y2         Y3        X1
## 1       Kabupaten Bogor    3201  3.89087874  1.4268379  3.2339117 2.5150407
## 2    Kabupaten Sukabumi    3202  2.38237167 -0.6300049  0.4951334 1.1162830
## 3     Kabupaten Cianjur    3203  0.01932756 -0.4631768  0.4644741 0.8979562
## 4     Kabupaten Bandung    3204 -0.26003930  1.2219984  0.8731409 1.6303285
## 5       Kabupaten Garut    3205  0.57874834  0.1502861  0.5052286 0.9544674
## 6 Kabupaten Tasikmalaya    3206 -0.42953032 -0.8665207 -0.5136343 0.1307255
##          X2         X3           X4          X5         X6         X7
## 1 3.1762126 -0.4080807  0.514015928  0.24508586 -0.5663039  1.1340976
## 2 0.9189430 -0.7045251 -0.488984132 -0.06370856 -0.9618837 -0.3284185
## 3 0.7314357 -0.7073609 -0.806839305 -1.11490050  0.5637008 -0.3835278
## 4 1.5507629 -0.3973921 -0.006763442  0.27991573  1.5133911  0.1951199
## 5 1.0369481 -0.6650428 -0.953335524 -0.75445358  1.6207806 -0.4365175
## 6 0.1035148 -0.6888194 -0.963241287 -1.45810125  0.4134041 -0.7322001
##           X8          X9
## 1  1.5066660  3.07916063
## 2 -0.5219945  0.86276808
## 3 -0.7355377  0.27474556
## 4 -0.2016797  0.99846558
## 5 -0.3084513  1.22462809
## 6 -0.6287661 -0.04188195
```

```
peta <- st_read(dsn = "Jawamap", layer = "jawa")
```

```
## Reading layer `jawa' from data source `/cloud/project/Jawamap' using driver `ESRI Shapefile'
## Simple feature collection with 119 features and 5 fields
## Geometry type: MULTIPOLYGON
## Dimension:     XY
## Bounding box:  xmin: 105.0998 ymin: -8.78036 xmax: 116.2702 ymax: -5.048857
## Geodetic CRS:  WGS 84
```

```
peta$ID2013
```

```
##   [1] "3101" "3171" "3172" "3173" "3174" "3175" "3201" "3202" "3203" "3204"
##  [11] "3205" "3206" "3207" "3208" "3209" "3210" "3211" "3212" "3213" "3214"
##  [21] "3215" "3216" "3217" "3218" "3271" "3272" "3273" "3274" "3275" "3276"
##  [31] "3277" "3278" "3279" "3301" "3302" "3303" "3304" "3305" "3306" "3307"
```

```
##  [41] "3308" "3309" "3310" "3311" "3312" "3313" "3314" "3315" "3316" "3317"
##  [51] "3318" "3319" "3320" "3321" "3322" "3323" "3324" "3325" "3326" "3327"
##  [61] "3328" "3329" "3371" "3372" "3373" "3374" "3375" "3376" "3401" "3402"
##  [71] "3403" "3404" "3471" "3501" "3502" "3503" "3504" "3505" "3506" "3507"
##  [81] "3508" "3509" "3510" "3511" "3512" "3513" "3514" "3515" "3516" "3517"
##  [91] "3518" "3519" "3520" "3521" "3522" "3523" "3524" "3525" "3526" "3527"
## [101] "3528" "3529" "3571" "3572" "3573" "3574" "3575" "3576" "3577" "3578"
## [111] "3579" "3601" "3602" "3603" "3604" "3671" "3672" "3673" "3674"
```

```
# Memilih Kab/Kota Jawa Barat (diawali dengan 32) (Jawa Barat)
jabar = peta[7:33,]
jabar
```

```
## Simple feature collection with 27 features and 5 fields
## Geometry type: MULTIPOLYGON
## Dimension:     XY
## Bounding box:  xmin: 106.3705 ymin: -7.823398 xmax: 108.8338 ymax: -5.91377
## Geodetic CRS:  WGS 84
## First 10 features:
##    PROVNO KABKOTNO   PROVINSI      KABKOT ID2013                       geometry
## 7      32       01 JAWA BARAT       BOGOR   3201 MULTIPOLYGON (((106.994 -6....
## 8      32       02 JAWA BARAT    SUKABUMI   3202 MULTIPOLYGON (((106.9652 -6...
## 9      32       03 JAWA BARAT     CIANJUR   3203 MULTIPOLYGON (((107.2843 -6...
## 10     32       04 JAWA BARAT     BANDUNG   3204 MULTIPOLYGON (((107.75 -6.8...
## 11     32       05 JAWA BARAT       GARUT   3205 MULTIPOLYGON (((108.1291 -7...
## 12     32       06 JAWA BARAT TASIKMALAYA   3206 MULTIPOLYGON (((108.1335 -7...
## 13     32       07 JAWA BARAT      CIAMIS   3207 MULTIPOLYGON (((108.3857 -7...
## 14     32       08 JAWA BARAT    KUNINGAN   3208 MULTIPOLYGON (((108.7587 -6...
## 15     32       09 JAWA BARAT     CIREBON   3209 MULTIPOLYGON (((108.5607 -6...
## 16     32       10 JAWA BARAT  MAJALENGKA   3210 MULTIPOLYGON (((108.3235 -6...
```

```
data[!complete.cases(data),]
```

```
##  [1] KabKot ID     Y1     Y2     Y3     X1     X2     X3     X4     X5
## [11] X6     X7     X8     X9
## <0 rows> (or 0-length row.names)
```

```
data.scaling[!complete.cases(data.scaling),]
```

```
##  [1] data.KabKot data.ID     Y1          Y2          Y3          X1
##  [7] X2          X3          X4          X5          X6          X7
## [13] X8          X9
## <0 rows> (or 0-length row.names)
```

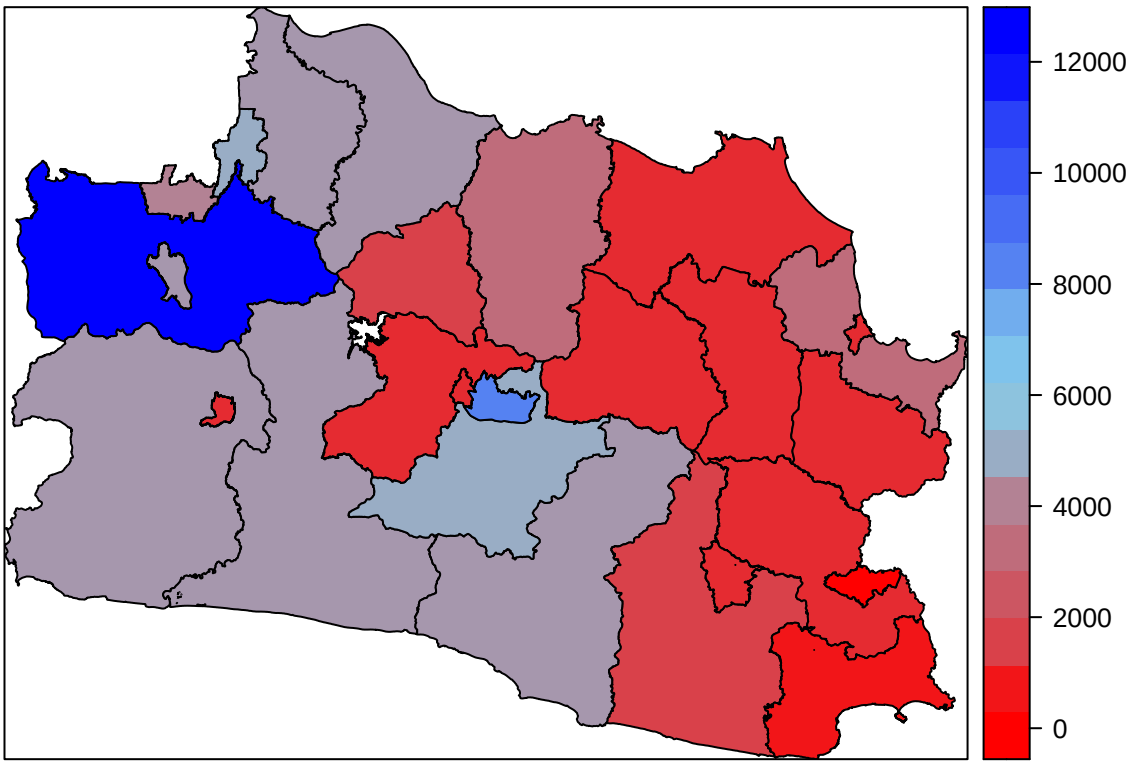
Eksplorasi spasial peubah jumlah penderita TBC 2022

```
k=20
colfunc <- colorRampPalette(c("red", "skyblue","blue"))
color <- colfunc(k)
polygon = jabar$geometry

jabar.2 = as(polygon, "Spatial")

jabar.2$Y<- data$Y3
```

```
spplot(jabar.2, "Y", col.regions=color)
```



Mendapatkan matriks ketetanggaan queen terstandarisasi

```
sp.peta <- SpatialPolygons(jabar.2@polygons)
qc <- poly2nb(sp.peta, queen = T)
qc
```

```
## Neighbour list object:
## Number of regions: 27
## Number of nonzero links: 106
## Percentage nonzero weights: 14.54047
## Average number of links: 3.925926
```

```
W.qc <- nb2listw(qc, style='W',zero.policy=TRUE)
ols <- lm(Y3~X1+X2+X3+X4+X5+X6+X7+X8+X9, data=data)
qct = lm.morantest(ols, W.qc, alternative="greater", zero.policy = TRUE)
qct
```

```
##
##  Global Moran I for regression residuals
##
## data:
## model: lm(formula = Y3 ~ X1 + X2 + X3 + X4 + X5 + X6 + X7 + X8 + X9,
## data = data)
## weights: W.qc
##
## Moran I statistic standard deviate = 1.162, p-value = 0.1226
## alternative hypothesis: greater
```

```
## sample estimates:
## Observed Moran I      Expectation         Variance
##       0.04346258      -0.10850122       0.01710423
```

```
longlat <- coordinates(jabar.2)
head(longlat)
```

```
##         [,1]      [,2]
## ID1 106.7687 -6.561184
## ID2 106.7101 -7.074623
## ID3 107.1578 -7.133713
## ID4 107.6108 -7.099969
## ID5 107.7889 -7.359586
## ID6 108.1413 -7.496892
```

```
jabar.2$long <- longlat[,1]
jabar.2$lat <- longlat[,2]
coords <- jabar.2[c("long","lat")]
#class(coords)
koord <- as.data.frame(coords)
djarak<-dist(longlat)
m.djarak<-as.matrix(djarak)
```

Mendapatkan matriks invers jarak

```
alpha = 1
W.idw <- 1/(m.djarak^alpha)
diag(W.idw) <- 0
rowTot <- rowSums(W.idw)
W.idw <- W.idw / rowTot
W.idw_list = mat2listw(W.idw,style='W')
W.idw_list
```

```
## Characteristics of weights list object:
## Neighbour list object:
## Number of regions: 27
## Number of nonzero links: 702
## Percentage nonzero weights: 96.2963
## Average number of links: 26
##
## Weights style: W
## Weights constants summary:
##    n  nn S0       S1       S2
## W 27 729 27 6.529294 109.6233
```

Menjawab persoalan nomor 1 yaitu Model SEM TBC 2022 dengan matriks ketetanggan terstandarisasi

```
library(spatialreg)
sem <- errorsarlm(Y3~X1+X2+X3+X4+X5+X6+X7+X8+X9, data=data.scaling,listw = W.qc, zero.policy = TRUE)
summary(sem)
```

```
##
```

```
## Call:errorsarlm(formula = Y3 ~ X1 + X2 + X3 + X4 + X5 + X6 + X7 +
##     X8 + X9, data = data.scaling, listw = W.qc, zero.policy = TRUE)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.437646 -0.230589  0.037595  0.176066  0.402830
##
## Type: error
## Coefficients: (asymptotic standard errors)
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)  0.0047437  0.0641397  0.0740 0.941043
## X1          -0.1570399  0.2068342 -0.7593 0.447700
## X2           0.5034528  0.3137612  1.6046 0.108588
## X3           0.2933948  0.1137168  2.5800 0.009879
## X4           0.3289990  0.2375747  1.3848 0.166107
## X5          -0.2769179  0.2153761 -1.2857 0.198533
## X6          -0.0968324  0.0643813 -1.5040 0.132569
## X7           0.2706765  0.1241638  2.1800 0.029258
## X8          -0.0969211  0.1128096 -0.8592 0.390254
## X9           0.4805096  0.2308080  2.0819 0.037355
##
## Lambda: 0.28074, LR test value: 0.40323, p-value: 0.52543
## Asymptotic standard error: 0.21946
##     z-value: 1.2792, p-value: 0.20081
## Wald statistic: 1.6365, p-value: 0.20081
##
## Log likelihood: 0.2693198 for error model
## ML residual variance (sigma squared): 0.056227, (sigma: 0.23712)
## Number of observations: 27
## Number of parameters estimated: 12
## AIC: 23.461, (AIC for lm: 21.865)
```

Menjawab persoalan nomor 2 yaitu Model SEM TBC 2022 dengan matriks invers jarak

```
sem <- errorsarlm(Y3~X1+X2+X3+X4+X5+X6+X7+X8+X9, data=data.scaling,listw = W.idw_list, zero.policy = TRU
summary(sem)
```

```
##
## Call:errorsarlm(formula = Y3 ~ X1 + X2 + X3 + X4 + X5 + X6 + X7 +
##     X8 + X9, data = data.scaling, listw = W.idw_list, zero.policy = TRUE)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.41232 -0.22568  0.05283  0.16573  0.47856
##
## Type: error
## Coefficients: (asymptotic standard errors)
##                Estimate  Std. Error z value Pr(>|z|)
## (Intercept) -7.1972e-05  4.5677e-02 -0.0016  0.99874
## X1          -1.6690e-01  2.1603e-01 -0.7726  0.43978
## X2           5.8701e-01  3.4107e-01  1.7211  0.08524
## X3           2.8022e-01  1.1495e-01  2.4377  0.01478
```

```
## X4           4.1324e-01  2.4441e-01  1.6907  0.09089
## X5          -3.1184e-01  2.2815e-01 -1.3668  0.17168
## X6          -1.0354e-01  6.4675e-02 -1.6009  0.10940
## X7           2.7119e-01  1.2603e-01  2.1518  0.03141
## X8          -1.2549e-01  1.1009e-01 -1.1399  0.25433
## X9           4.4588e-01  2.4805e-01  1.7975  0.07226
##
## Lambda: -0.016911, LR test value: 0.00048246, p-value: 0.98248
## Asymptotic standard error: 0.39323
##     z-value: -0.043005, p-value: 0.9657
## Wald statistic: 0.0018495, p-value: 0.9657
##
## Log likelihood: 0.0679456 for error model
## ML residual variance (sigma squared): 0.058254, (sigma: 0.24136)
## Number of observations: 27
## Number of parameters estimated: 12
## AIC: 23.864, (AIC for lm: 21.865)
```

Menjawab persoalan nomor 3 yaitu Model SEM Diare 2022 dengan matriks ketetanggaan queen terstandarisasi

```
SLX <- lmSLX(Y1~X1+X2+X3+X4+X5+X6+X7+X8+X9, data=data.scaling,listw = W.qc, zero.policy = TRUE)
```

```
## Warning in RET$pfunction("adjusted", ...): Completion with error > abseps

## Warning in RET$pfunction("adjusted", ...): Completion with error > abseps

## Warning in RET$pfunction("adjusted", ...): Completion with error > abseps

## Warning in RET$pfunction("adjusted", ...): Completion with error > abseps
```

```
summary(SLX)
```

```
##
## Call:
## lm(formula = formula(paste("y ~ ", paste(colnames(x)[-1], collapse = "+"))),
##     data = as.data.frame(x), weights = weights)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.45606 -0.12766  0.06481  0.18592  0.38245
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.05666    0.18318  -0.309  0.76500
## X1          -1.24711    0.49621  -2.513  0.03619 *
## X2           1.97800    0.81388   2.430  0.04118 *
## X3           0.31542    0.32429   0.973  0.35921
## X4          -0.24142    0.69431  -0.348  0.73703
## X5           0.14725    0.48056   0.306  0.76712
## X6          -0.78039    0.18607  -4.194  0.00302 **
## X7          -0.52307    0.68273  -0.766  0.46559
## X8          -0.03825    0.35342  -0.108  0.91647
```

```
## X9           0.34679    0.56145   0.618  0.55396
## lag.X1       1.20900    1.41075   0.857  0.41638
## lag.X2       2.67857    2.04221   1.312  0.22604
## lag.X3       1.46093    0.94760   1.542  0.16171
## lag.X4      -1.05397    1.54165  -0.684  0.51350
## lag.X5      -0.08670    1.52538  -0.057  0.95607
## lag.X6      -0.59325    0.53852  -1.102  0.30266
## lag.X7       1.07735    2.00538   0.537  0.60572
## lag.X8      -0.95641    0.92781  -1.031  0.33278
## lag.X9      -3.36387    1.29835  -2.591  0.03207 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4281 on 8 degrees of freedom
## Multiple R-squared:  0.9436, Adjusted R-squared:  0.8167
## F-statistic: 7.438 on 18 and 8 DF,  p-value: 0.003468
```