korelasi-kanonik.R

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library(dplyr)

s <- '1 41.5 45.9 11.2 162 23.0 3.0  
2 33.8 53.3 11.2 162 23.0 8.0  
3 27.7 57.5 12.7 162 30.0 5.0  
4 21.7 58.8 16.0 162 30.0 8.0  
5 19.9 60.6 16.2 172 25.0 5.0  
6 15.0 58.0 22.6 172 25.0 8.0  
7 12.2 58.6 24.5 172 30.0 5.0  
8 4.3 52.4 38.0 172 30.0 8.0  
9 19.3 56.9 21.3 167 27.5 6.5  
10 6.4 55.4 30.8 177 27.5 6.5  
11 37.6 46.9 14.7 157 27.5 6.5  
12 18.0 57.3 22.2 167 32.5 6.5  
13 26.3 55.0 18.3 167 22.5 6.5  
14 9.9 58.9 28.0 167 27.5 9.5  
15 25.0 50.3 22.1 167 27.5 3.5  
16 14.1 61.1 23.0 177 20.0 6.5  
17 15.2 62.9 20.7 177 20.0 6.5  
18 15.9 60.0 22.1 160 34.0 7.5  
19 19.6 60.6 19.3 160 34.0 7.5  
'  
  
dat <- read.table(textConnection(s), header = F) %>%   
 dplyr::select(-1) %>%   
 setNames(c('X1', 'X2', 'X3', 'X4', 'X5', 'X6'))  
  
dat

## X1 X2 X3 X4 X5 X6  
## 1 41.5 45.9 11.2 162 23.0 3.0  
## 2 33.8 53.3 11.2 162 23.0 8.0  
## 3 27.7 57.5 12.7 162 30.0 5.0  
## 4 21.7 58.8 16.0 162 30.0 8.0  
## 5 19.9 60.6 16.2 172 25.0 5.0  
## 6 15.0 58.0 22.6 172 25.0 8.0  
## 7 12.2 58.6 24.5 172 30.0 5.0  
## 8 4.3 52.4 38.0 172 30.0 8.0  
## 9 19.3 56.9 21.3 167 27.5 6.5  
## 10 6.4 55.4 30.8 177 27.5 6.5  
## 11 37.6 46.9 14.7 157 27.5 6.5  
## 12 18.0 57.3 22.2 167 32.5 6.5  
## 13 26.3 55.0 18.3 167 22.5 6.5  
## 14 9.9 58.9 28.0 167 27.5 9.5  
## 15 25.0 50.3 22.1 167 27.5 3.5  
## 16 14.1 61.1 23.0 177 20.0 6.5  
## 17 15.2 62.9 20.7 177 20.0 6.5  
## 18 15.9 60.0 22.1 160 34.0 7.5  
## 19 19.6 60.6 19.3 160 34.0 7.5

X1 <- dat[, 1:3]  
X2 <- dat[, 4:6]  
  
X1

## X1 X2 X3  
## 1 41.5 45.9 11.2  
## 2 33.8 53.3 11.2  
## 3 27.7 57.5 12.7  
## 4 21.7 58.8 16.0  
## 5 19.9 60.6 16.2  
## 6 15.0 58.0 22.6  
## 7 12.2 58.6 24.5  
## 8 4.3 52.4 38.0  
## 9 19.3 56.9 21.3  
## 10 6.4 55.4 30.8  
## 11 37.6 46.9 14.7  
## 12 18.0 57.3 22.2  
## 13 26.3 55.0 18.3  
## 14 9.9 58.9 28.0  
## 15 25.0 50.3 22.1  
## 16 14.1 61.1 23.0  
## 17 15.2 62.9 20.7  
## 18 15.9 60.0 22.1  
## 19 19.6 60.6 19.3

X2

## X4 X5 X6  
## 1 162 23.0 3.0  
## 2 162 23.0 8.0  
## 3 162 30.0 5.0  
## 4 162 30.0 8.0  
## 5 172 25.0 5.0  
## 6 172 25.0 8.0  
## 7 172 30.0 5.0  
## 8 172 30.0 8.0  
## 9 167 27.5 6.5  
## 10 177 27.5 6.5  
## 11 157 27.5 6.5  
## 12 167 32.5 6.5  
## 13 167 22.5 6.5  
## 14 167 27.5 9.5  
## 15 167 27.5 3.5  
## 16 177 20.0 6.5  
## 17 177 20.0 6.5  
## 18 160 34.0 7.5  
## 19 160 34.0 7.5

res.cc <- candisc::cancor(X1, X2)  
summary(res.cc)

##   
## Canonical correlation analysis of:  
## 3 X variables: X1, X2, X3   
## with 3 Y variables: X4, X5, X6   
##   
## CanR CanRSQ Eigen percent cum scree  
## 1 0.98153 0.963395 26.318349 99.60771 99.61 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
## 2 0.30199 0.091200 0.100353 0.37981 99.99   
## 3 0.05733 0.003287 0.003298 0.01248 100.00   
##   
## Test of H0: The canonical correlations in the   
## current row and all that follow are zero  
##   
## CanR LR test stat approx F numDF denDF Pr(> F)   
## 1 0.98153 0.03316 10.7870 9 31.789 1.884e-07 \*\*\*  
## 2 0.30199 0.90581 0.3549 4 28.000 0.8384   
## 3 0.05733 0.99671 0.0495 1 15.000 0.8270   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Raw canonical coefficients  
##   
## X variables:   
## Xcan1 Xcan2 Xcan3  
## X1 -0.170794 -0.62594 0.37732  
## X2 -0.069097 -0.72999 0.21730  
## X3 -0.085825 -0.71274 0.53900  
##   
## Y variables:   
## Ycan1 Ycan2 Ycan3  
## X4 0.16062 0.06944 -0.049094  
## X5 0.14861 0.12159 0.191179  
## X6 0.21568 -0.58392 0.037688

res\_cc <- CCA::cc(X1, X2)  
  
# Korelasi X1 dengan U  
res\_cc$scores$corr.X.xscores

## [,1] [,2] [,3]  
## X1 -0.9954170 0.07757607 -0.05591924  
## X2 0.6033066 -0.52598224 -0.59946959  
## X3 0.8615072 0.06822615 0.50314074

# Korelasi X1 dengan V  
res\_cc$scores$corr.X.yscores

## [,1] [,2] [,3]  
## X1 -0.9770283 0.02342752 -0.00320610  
## X2 0.5921615 -0.15884355 -0.03437028  
## X3 0.8455922 0.02060390 0.02884731

# Korelasi X2 dengan V  
res\_cc$scores$corr.Y.yscores

## [,1] [,2] [,3]  
## X4 0.7002371 0.2147010 -0.6808608  
## X5 0.2303823 0.1471813 0.9619052  
## X6 0.4415774 -0.8719836 0.2113147

# Korelasi X2 dengan U  
res\_cc$scores$corr.Y.xscores

## [,1] [,2] [,3]  
## X4 0.6873014 0.06483844 -0.03903680  
## X5 0.2261263 0.04444788 0.05515033  
## X6 0.4334200 -0.26333395 0.01211562