# CCA example

Hsuan

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```
# X   Y
X <- swiss[,c('Agriculture','Examination','Education','Catholic')]
Y <- swiss[,c('Fertility','Infant.Mortality')]

#
cca <- cancor(X,Y)
cca$cor
```

[1] 0.8142291 0.2222637

```
#
cca$xcoef ; cca$ycoef
```

[,1] [,2] [,3] [,4]

Agriculture 0.002927154 -0.007572820 0.002174269 0.004456738 Examination 0.003966372 0.003651784 -0.016699457 0.030780189 Education 0.013881513 -0.005200828 0.018471735 -0.008450251 Catholic -0.001716300 0.002645081 0.000745374 0.003564550 [,1] [,2] Fertility -0.012468376 -0.003619972 Infant.Mortality 0.008160651 0.055080041

```
#
X_loadings <- cor(X, as.matrix(X) %*% cca$xcoef)
Y_loadings <- cor(Y, as.matrix(Y) %*% cca$ycoef)
X_loadings ; Y_loadings
```

```
                [,1]       [,2]       [,3]       [,4]
```

Agriculture -0.4701237 -0.7851373 0.2694378 0.29991052 Examination 0.8153728 0.3330355 -0.4129371 0.23181365 Education 0.8415141 0.4297067 0.3269309 0.01795357 Catholic -0.5668231 0.2193228 0.6773432 0.41450605 [,1] [,2] Fertility -0.9892018 0.1465600 Infant.Mortality -0.2788188 0.9603437

```
#
round(colSums(X_loadings^2)/4,4) ; round(colSums(Y_loadings^2)/2,4)
```

[1] 0.4788 0.2400 0.2022 0.0790 [1] 0.5281 0.4719

```
#
round(cca$cor^2,4)
```

[1] 0.6630 0.0494

```
#
round((colSums(X_loadings^2)[1:2]/4)*cca$cor^2,4)
```

[1] 0.3174 0.0119

```
round((colSums(Y_loadings^2)[1:2]/2)*cca$cor^2,4)
```

[1] 0.3501 0.0233