**How to port BECON-EEM for S-Plus to R**

1. Get the source codes for S-plus.

The paper including the codes are as follows:

Béguin, Cédric,, Beat Hulliger (2003). Robust multivariate outlier detection and imputation with incomplete survey data, EUREDIT Deliverable D4/5.2.1/2 Part C, pp.176-187.

[<http://www.cs.york.ac.uk/euredit/results/Results/Robust/Part%20C.zip>]

Download the zip file, unzip it, and copy the codes for BECON-EEM(BEM) algorithm at pages 176 to 187 including comments and paste them on a text editor (the one which shows the line numbers are desirable). The number of total lines are 767 at this stage.

1. Remove the page header and fotter.

A page footer (page number) and a header (”ROBUST MULTIVARIATE OUTLIER DETECTION AND IMPUTATION”) are included in each page. Remove them. The number of lines become 745, after 11 pages x 2 lines are removed.

1. Some characters might be corrupted probably depending on environment. Check it by saving the codes, as “BEM.r” for example, and loading it to R by ‘source("c:/R/BEM2.r").

In case of Japanese Windows environment, the character “^” is corrupted and the following corrections are needed. The figures in the belackets are line numbers.

[86] return(sum(w\*(x-mean)^2)/(sum(w)-1))

[296] apply(sweep(data,2,EM.mean)^2,1,sum,na.rm=T)\*p/(p-apply(is.na(data),1,sum))

[492] test <- (c.np+c.hr)^2\*chi.sq

1. Modify the codes as follows:

[44] # pos <- compare(cumsum(w),sum(w)/2)

(replace)

pos <- rep(0, n)

pos[c(cumsum(w) > sum(w)/2)] <- 1

pos[c(cumsum(w) < sum(w)/2)] <- -1

[56] ############# Weighted variance/covariance matrix #############

[57] #

[58] # Does not accept missing values

[59] #

(insert the following line right after the comments above)

oka.kakeru <- function(x,w) x\*w # restrain memory usage

[64] # return((t(sweep(x,2,mean))%\*%diag(w)%\*%sweep(x,2,mean))/(sum(w)-1))

(replace)

xs <- apply(sweep(x,2,mean), 2, oka.kakeru, w=w)

return((t(xs)%\*%sweep(x,2,mean))/(sum(w)-1))

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