**2019/12/11  
108學年度第一學期 高維度資料分析 小考(2)**

系級: 姓名:

# 貼上執行程式碼及執行結果及圖形

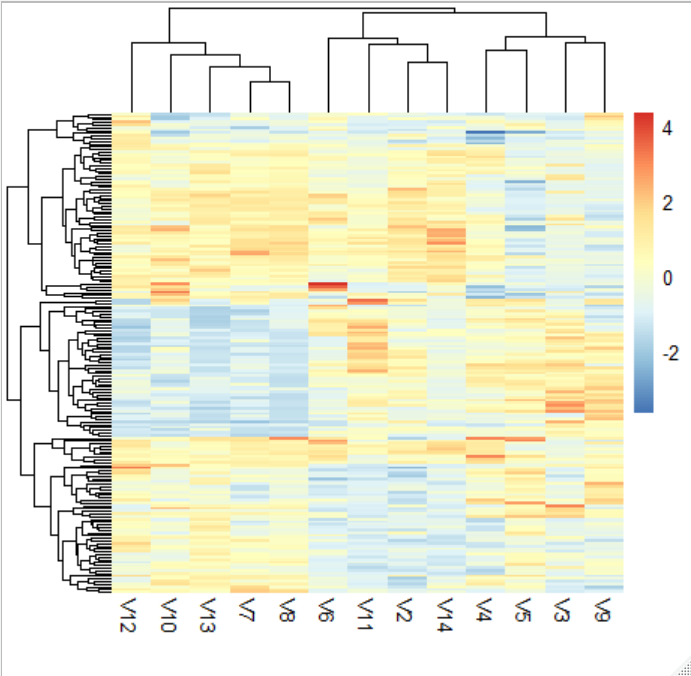
# 大概解釋一下圖形所呈現的現象  
(程式碼字形為Courier New，10點字，單行距。)

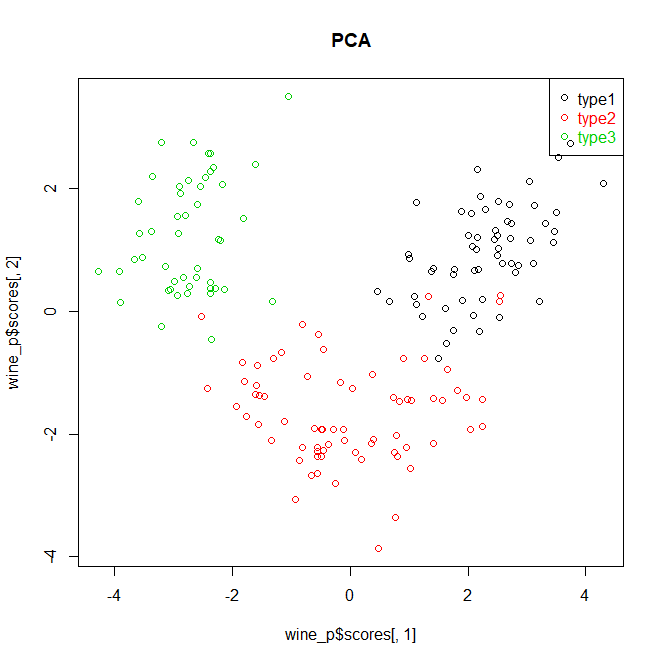
(貼圖時，請注意圖形之大小，應適中; 圖內之文字數字應可識別。)

# 2

#(a)

> pheatmap(scale(wine[, 2 : 14]), annotation\_row = wineclus)





#(b)

> wine\_p <- princomp(scale(wine[, 2 : 14]))

> windows()

> plot(wine\_p$scores[, 1], wine\_p$scores[, 2], col = wine[, 1], main = "PCA")

> legend("topright", c("type1", "type2", "type3"), col = c(1, 2, 3), pch = 1, text.col = c(1, 2, 3))

>

> wine.sd <- t(scale(wine[2 : 14]))

> wine.cor <- cor(wine.sd)

> wine.dis <- sqrt(2 \* (1 - wine.cor))

> wine\_mds <- cmdscale(wine.dis, k = 10)

> windows()

> plot(wine\_mds[, 1], wine\_mds[, 2], col = wine[, 1], main = "MDS")

> legend("topright", c("type1", "type2", "type3"), col = c(1, 2, 3), pch = 1, text.col = c(1, 2, 3))

>

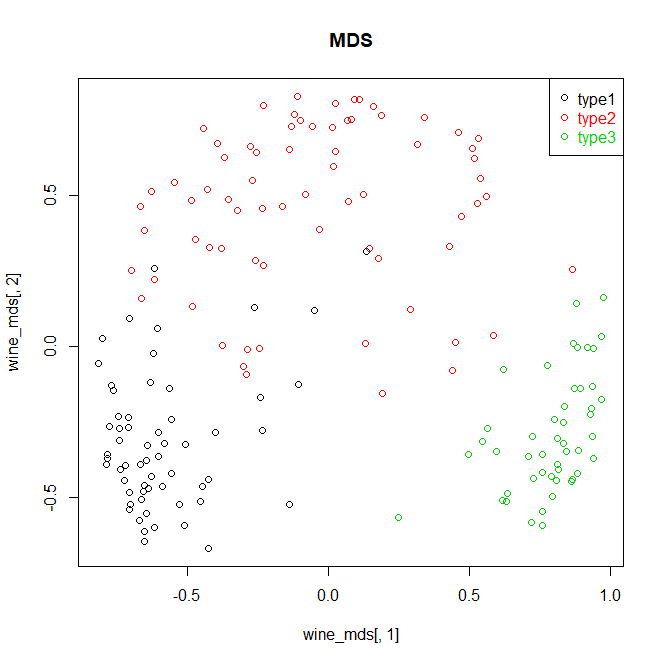
> library(vegan)

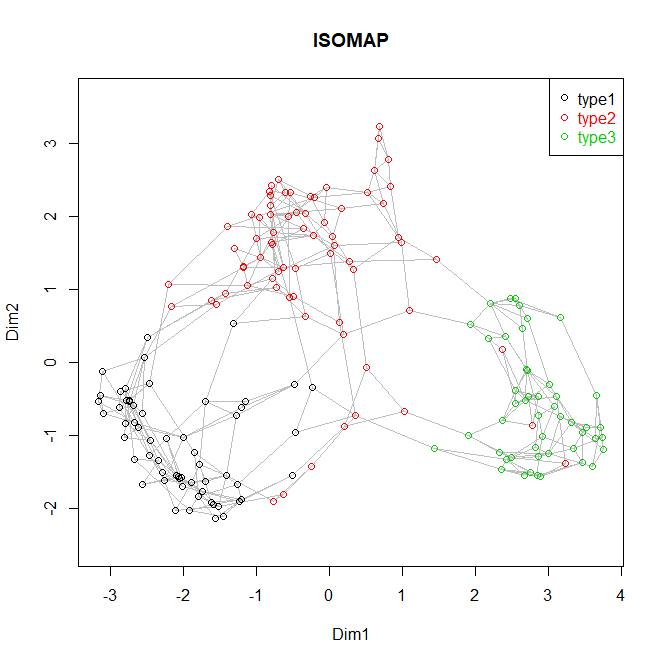
> wine\_isom <- isomap(wine.dis, k = 3)

> windows()

> plot(wine\_isom, col = wine[, 1], main = "ISOMAP")

> legend("topright", c("type1", "type2", "type3"), col = c(1, 2, 3), pch = 1, text.col = c(1, 2, 3))





#(c)

library(e1071)

> x <- wine[, 2 : 14]

> y <- wine[, 1]

> model <- svm(x, y)

> pred <- predict(model, x)

> accuracy <- sum(diag(table(pred, y))) / length(y)

> accuracy

[1] 0.005617978

#PCA

> svmacc <- function(DR\_data, num\_dimesions, data\_cate){

+ acc\_vec <- rep(NaN, num\_dimesions)

+

+ for (i in 1 : num\_dimesions) {

+ x <- DR\_data[, i]

+ y <- data\_cate

+ model <- svm(x, y)

+ pred <- predict(model, x)

+ acc\_vec[i] <- sum(diag(table(pred, y))) / length(y)

+ }

+ acc\_vec

+ }

>

> wine\_svm\_pca <- svmacc(wine\_p$scores, 10, wine[, 1])

>

> wine\_svm\_mds <- svmacc(wine\_mds, 10, wine[, 1])

>

> wine\_svm\_isom <- svmacc(wine\_isom$points, 10, wine[, 1])

>

> plot(wine\_svm\_pca, type = "l", ylim = c(0, 0.05))

> points(wine\_svm\_mds, type = "l", col = "green", lty = 2)

> points(wine\_svm\_isom, type = "l", col = "red", lty = 3)

> legend("topright", c("PCA", "MDS", "ISOMAP"), col = c("black", "green", "red"), lty = c(1, 2, 3))

