# 2020/12/11(五), 109學年第一學期 資料科學應用 R期中考

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# 本檔案為各題之程式碼檔，無執行結果

#ex.1

study <- function(x, y){

#x <- 13

#y <- 8

#預算限制式

Eng.hr <- x

#Eng.hr

Comp.hr <- y

#Comp.hr

Tuition <- ((400\*x) + (600\*y) )

#Tuition

ifelse((limt <= 12000), limt, 0)

#limt

#效用函數

U <- sqrt(x)\*sqrt(y)

#U

Fit <- ifelse(Tuition <=12000, "\*"," ")

study.table <- data.frame(Eng.hr, Comp.hr, Tuition, U, Fit)

study.table

}

x <- rep(13:17, 5)

y <- rep(8:12, each=5)

study(x, y)

#ex.2(a)

library(readxl)

student\_test <- read\_excel("data/Score-109.xlsx", na = "NA", skip=1)

student\_test

#印出前後五筆資料

head(student\_test, 5)

tail(student\_test, 5)

#ex.2(b) 印出"請問有哪些同學兩科成績同時不及格

#將遺失值填入0

student\_test[is.na(student\_test)] <- 0

student\_test

id <- which((student\_test$Calculus+ student\_test$English) < 60)

student\_test[id, ]

#ex.2(c) 寫相關係數函數

x1 <- student\_test$Calculus

x2 <- student\_test$English

my.cor <- function(x1, x2){

# x1 <- 5

# x2 <- 10

x1.bar <- mean(x1)

x2.bar <- mean(x2)

a <- sum((x1- x1.bar)\*(x2 - x2.bar))

b <- sqrt(sum((x1- x1.bar)^2)) \* sqrt(sum((x2 - x2.bar)^2))

ans <- a/b

ans

}

x1 <- student\_test$Calculus

x2 <- student\_test$English

my.cor(x1, x2)

#ex.2(d) 計算微積分及英文兩成績之相關係數

x1 <- student\_test$Calculus

x2 <- student\_test$English

my.cor(x1, x2)

cor(x1, x2)

#ex.3(a)

my\_dnorm <- function(x, u = 0, z = 1){

#x <- 1

#u <- 0

#z <- 1

e <- 2.718282

density <- (1/(sqrt(2\*pi)\*z))\*e^(-(x-u)^2/2\*z)

density

}

my\_dnorm(2.5, 3, 2)

#ex.3(b)

x <- rep(-3:3)

dnorm <- my\_dnorm(x, 3, 2)

my.dnorm <- my\_dnorm(x, 3, 2)

my.dnorm.table <-data.frame(x, dnorm, my.dnorm)

my.dnorm.table