# HW7

# Wenhui Yang

# 2/18/2019

**# Exercise 1**

mtcars

> mtcars

mpg cyl disp hp drat wt qsec vs am gear carb

Mazda RX4 21.0 6 160.0 110 3.90 2.620 16.46 0 1 4 4

Mazda RX4 Wag 21.0 6 160.0 110 3.90 2.875 17.02 0 1 4 4

Datsun 710 22.8 4 108.0 93 3.85 2.320 18.61 1 1 4 1

Hornet 4 Drive 21.4 6 258.0 110 3.08 3.215 19.44 1 0 3 1

Hornet Sportabout 18.7 8 360.0 175 3.15 3.440 17.02 0 0 3 2

Valiant 18.1 6 225.0 105 2.76 3.460 20.22 1 0 3 1

Duster 360 14.3 8 360.0 245 3.21 3.570 15.84 0 0 3 4

Merc 240D 24.4 4 146.7 62 3.69 3.190 20.00 1 0 4 2

Merc 230 22.8 4 140.8 95 3.92 3.150 22.90 1 0 4 2

Merc 280 19.2 6 167.6 123 3.92 3.440 18.30 1 0 4 4

Merc 280C 17.8 6 167.6 123 3.92 3.440 18.90 1 0 4 4

Merc 450SE 16.4 8 275.8 180 3.07 4.070 17.40 0 0 3 3

Merc 450SL 17.3 8 275.8 180 3.07 3.730 17.60 0 0 3 3

Merc 450SLC 15.2 8 275.8 180 3.07 3.780 18.00 0 0 3 3

Cadillac Fleetwood 10.4 8 472.0 205 2.93 5.250 17.98 0 0 3 4

Lincoln Continental 10.4 8 460.0 215 3.00 5.424 17.82 0 0 3 4

Chrysler Imperial 14.7 8 440.0 230 3.23 5.345 17.42 0 0 3 4

Fiat 128 32.4 4 78.7 66 4.08 2.200 19.47 1 1 4 1

Honda Civic 30.4 4 75.7 52 4.93 1.615 18.52 1 1 4 2

Toyota Corolla 33.9 4 71.1 65 4.22 1.835 19.90 1 1 4 1

Toyota Corona 21.5 4 120.1 97 3.70 2.465 20.01 1 0 3 1

Dodge Challenger 15.5 8 318.0 150 2.76 3.520 16.87 0 0 3 2

AMC Javelin 15.2 8 304.0 150 3.15 3.435 17.30 0 0 3 2

Camaro Z28 13.3 8 350.0 245 3.73 3.840 15.41 0 0 3 4

Pontiac Firebird 19.2 8 400.0 175 3.08 3.845 17.05 0 0 3 2

Fiat X1-9 27.3 4 79.0 66 4.08 1.935 18.90 1 1 4 1

Porsche 914-2 26.0 4 120.3 91 4.43 2.140 16.70 0 1 5 2

Lotus Europa 30.4 4 95.1 113 3.77 1.513 16.90 1 1 5 2

Ford Pantera L 15.8 8 351.0 264 4.22 3.170 14.50 0 1 5 4

Ferrari Dino 19.7 6 145.0 175 3.62 2.770 15.50 0 1 5 6

Maserati Bora 15.0 8 301.0 335 3.54 3.570 14.60 0 1 5 8

Volvo 142E 21.4 4 121.0 109 4.11 2.780 18.60 1 1 4 2

head(mtcars)

> head(mtcars)

mpg cyl disp hp drat wt qsec vs am gear carb

Mazda RX4 21.0 6 160 110 3.90 2.620 16.46 0 1 4 4

Mazda RX4 Wag 21.0 6 160 110 3.90 2.875 17.02 0 1 4 4

Datsun 710 22.8 4 108 93 3.85 2.320 18.61 1 1 4 1

Hornet 4 Drive 21.4 6 258 110 3.08 3.215 19.44 1 0 3 1

Hornet Sportabout 18.7 8 360 175 3.15 3.440 17.02 0 0 3 2

Valiant 18.1 6 225 105 2.76 3.460 20.22 1 0 3 1

tail(mtcars)

> tail(mtcars)

mpg cyl disp hp drat wt qsec vs am gear carb

Porsche 914-2 26.0 4 120.3 91 4.43 2.140 16.7 0 1 5 2

Lotus Europa 30.4 4 95.1 113 3.77 1.513 16.9 1 1 5 2

Ford Pantera L 15.8 8 351.0 264 4.22 3.170 14.5 0 1 5 4

Ferrari Dino 19.7 6 145.0 175 3.62 2.770 15.5 0 1 5 6

Maserati Bora 15.0 8 301.0 335 3.54 3.570 14.6 0 1 5 8

Volvo 142E 21.4 4 121.0 109 4.11 2.780 18.6 1 1 4 2

str(mtcars)

> str(mtcars)

'data.frame': 32 obs. of 11 variables:

$ mpg : num 21 21 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 ...

$ cyl : num 6 6 4 6 8 6 8 4 4 6 ...

$ disp: num 160 160 108 258 360 ...

$ hp : num 110 110 93 110 175 105 245 62 95 123 ...

$ drat: num 3.9 3.9 3.85 3.08 3.15 2.76 3.21 3.69 3.92 3.92 ...

$ wt : num 2.62 2.88 2.32 3.21 3.44 ...

$ qsec: num 16.5 17 18.6 19.4 17 ...

$ vs : num 0 0 1 1 0 1 0 1 1 1 ...

$ am : num 1 1 1 0 0 0 0 0 0 0 ...

$ gear: num 4 4 4 3 3 3 3 4 4 4 ...

$ carb: num 4 4 1 1 2 1 4 2 2 4 ...

lm(mtcars$mpg~mtcars$cyl+mtcars$hp)

Call:

lm(formula = mtcars$mpg ~ mtcars$cyl + mtcars$hp)

Coefficients:

(Intercept) mtcars$cyl mtcars$hp

36.90833 -2.26469 -0.01912

mtcars[grep("Merc",rownames(mtcars)),]

> mtcars[grep("Merc",rownames(mtcars)),]

mpg cyl disp hp drat wt qsec vs am gear carb

Merc 240D 24.4 4 146.7 62 3.69 3.19 20.0 1 0 4 2

Merc 230 22.8 4 140.8 95 3.92 3.15 22.9 1 0 4 2

Merc 280 19.2 6 167.6 123 3.92 3.44 18.3 1 0 4 4

Merc 280C 17.8 6 167.6 123 3.92 3.44 18.9 1 0 4 4

Merc 450SE 16.4 8 275.8 180 3.07 4.07 17.4 0 0 3 3

Merc 450SL 17.3 8 275.8 180 3.07 3.73 17.6 0 0 3 3

Merc 450SLC 15.2 8 275.8 180 3.07 3.78 18.0 0 0 3 3

**# Exercise 2**

name <- c("Apple", "MS", "Google", "Honda", "GM", "Volks", "Hyundai", "Amazon")

type <- c("IT", "IT", "IT", "Auto", "Auto", "Auto", "Auto", "IT")

stock <- c(165.5, 55.48, 1119.20, 36.16, 41, 172.06, 162.5, 1429.95)

US <- c(TRUE, TRUE, TRUE, FALSE, TRUE, FALSE, FALSE, TRUE)

#

portfolio <- data.frame(name,type,stock,US)

rm(name,type,stock,US)

#

str(portfolio)

> str(portfolio)

'data.frame': 8 obs. of 4 variables:

$ name : Factor w/ 8 levels "Amazon","Apple",..: 2 7 4 5 3 8 6 1

$ type : Factor w/ 2 levels "Auto","IT": 2 2 2 1 1 1 1 2

$ stock: num 165.5 55.5 1119.2 36.2 41 ...

$ US : logi TRUE TRUE TRUE FALSE TRUE FALSE ...

portfolio$name <- as.character(portfolio$name)

#

spg <- portfolio[portfolio$name=="Google",3] # stock price of google

spg

> spg

[1] 1119.2

google <- portfolio[portfolio$name=="Google",] # data for google

google

> google

name type stock US

3 Google IT 1119.2 TRUE

ffc <- portfolio$stock[1:5] # first 5 values of stock column

ffc

> ffc

[1] 165.50 55.48 1119.20 36.16 41.00

IT <- subset(portfolio, subset = type =="IT") #data for IT companies

IT

> IT

name type stock US

1 Apple IT 165.50 TRUE

2 MS IT 55.48 TRUE

3 Google IT 1119.20 TRUE

8 Amazon IT 1429.95 TRUE

sla <-subset(portfolio,subset = stock < portfolio[portfolio$name=="Apple",3])

sla # data for companies whose stock price is lower than Apple

> sla

name type stock US

2 MS IT 55.48 TRUE

4 Honda Auto 36.16 FALSE

5 GM Auto 41.00 TRUE

7 Hyundai Auto 162.50 FALSE

#

rank <- order(portfolio$stock,decreasing = TRUE)

rank

> rank

[1] 8 3 6 1 7 2 5 4

portfolio[rank,]

> portfolio[rank,]

name type stock US

8 Amazon IT 1429.95 TRUE

3 Google IT 1119.20 TRUE

6 Volks Auto 172.06 FALSE

1 Apple IT 165.50 TRUE

7 Hyundai Auto 162.50 FALSE

2 MS IT 55.48 TRUE

5 GM Auto 41.00 TRUE

4 Honda Auto 36.16 FALSE