## Homework 2 - 20 Jul 2018

#-------------------Introduction----------------------

# copying the original dataset

myCars <- mtcars

#-----------------------------------------------------

# Step 1: What is the hp (hp stands for “horse power”)

# Q1) What is the highest hp?

(maxHp <- max(myCars$hp))

# Q2) Which car has the highest HP?

(maxHp.car <- rownames(myCars[myCars$hp == maxHp, ]))

#-----------------------------------------------------

#Step 2: Explore mpg (mpg stands for “miles per gallon”)

# Q3) What is the highest mpg?

(maxMpg <- max(myCars$mpg))

# Q4) What car has the highest mpg?

(maxMpg.car <- rownames(myCars[myCars$mpg == maxMpg,]))

# Q5) Create a sorted dataframe, based on mpg

(mpgCars <- myCars[order(-myCars$mpg),])

#-----------------------------------------------------

# Step 3: Which car has the “best” combination of mpg and hp?

# Q6) What logic did you use?

# I ranked both of the mpg and the hp and took with the worst car getting a 1 and the best car

#getting a 32

# Q7) Which cars?

# Getting the max score from the number of rows

bestScore <- dim(myCars)[1]

# Setting up scoring from 1 to max score

scores <- 1:bestScore

# Combining myCars ordered by mpg with the rankings from 1 to 32

myCars <- cbind(myCars[order(myCars$mpg), ], mpgScore = scores)

# Combining myCars ordered by hp with the rankings from 1 to 32

myCars <- cbind(myCars[order(myCars$hp), ], hpScore = scores)

# Summing the rankings of the two cars

myCars$finalScore <- myCars$mpgScore + myCars$hpScore

# Selecting the first score returned by the descending order function and getting the rowname

# This returns the best car by this scoring method

(bestCar <- rownames(myCars[order(-myCars$finalScore)[1], ]))

# Returns Lotus Europa

#-----------------------------------------------------

# Step 4: Which car has “best” car combination of mpg and

# hp, where mpg and hp must be given equal weight?

# Going to standardize the mpg and the hp so there is a mean of 0 and a sd of 1

# So will

# First creating a function to feature scale

standardize <- function(feature){

#getting the mean

xbar <- mean(feature)

# getting the standard deviation

xsd <- sd(feature)

#returning the feature subtracted by the minimum and divided by the max - min

return((feature - xbar) / xsd)

}

# Feature scaling mpg

myCars$mpgStd <- standardize(myCars$mpg)

# Feature Scaling hp

myCars$hpStd <- standardize(myCars$hp)

# Adding the new hp and mpg together

myCars$finalStdScore <- myCars$mpgStd + myCars$hpStd

# Getting the best finalScore rowname (aka the car) from descending order funtion

(bestCar <- rownames(myCars[order(-myCars$finalStdScore)[1], ]))

# returns Maserati Bora

**Console log w/plot**

**Executed code**

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| > ## Homework 2 - 20 Jul 2018  >  > #-------------------Introduction----------------------  >  > # copying the original dataset  > myCars <- mtcars  >  > #-----------------------------------------------------  > # Step 1: What is the hp (hp stands for “horse power”)  >  > # Q1) What is the highest hp?  > (maxHp <- max(myCars$hp))  [1] 335  >  > # Q2) Which car has the highest HP?  > (maxHp.car <- rownames(myCars[myCars$hp == maxHp, ]))  [1] "Maserati Bora"  >  > #-----------------------------------------------------  > #Step 2: Explore mpg (mpg stands for “miles per gallon”)  >  > # Q3) What is the highest mpg?  > (maxMpg <- max(myCars$mpg))  [1] 33.9  >  > # Q4) What car has the highest mpg?  > (maxMpg.car <- rownames(myCars[myCars$mpg == maxMpg,]))  [1] "Toyota Corolla"  >  > # Q5) Create a sorted dataframe, based on mpg  > (mpgCars <- myCars[order(-myCars$mpg),])  mpg cyl disp hp drat wt qsec vs am gear carb  Toyota Corolla 33.9 4 71.1 65 4.22 1.835 19.90 1 1 4 1  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  Lotus Europa 30.4 4 95.1 113 3.77 1.513 16.90 1 1 5 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  Merc 240D 24.4 4 146.7 62 3.69 3.190 20.00 1 0 4 2  Datsun 710 22.8 4 108.0 93 3.85 2.320 18.61 1 1 4 1  Merc 230 22.8 4 140.8 95 3.92 3.150 22.90 1 0 4 2  Toyota Corona 21.5 4 120.1 97 3.70 2.465 20.01 1 0 3 1  Hornet 4 Drive 21.4 6 258.0 110 3.08 3.215 19.44 1 0 3 1  Volvo 142E 21.4 4 121.0 109 4.11 2.780 18.60 1 1 4 2  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  Ferrari Dino 19.7 6 145.0 175 3.62 2.770 15.50 0 1 5 6  Merc 280 19.2 6 167.6 123 3.92 3.440 18.30 1 0 4 4  Pontiac Firebird 19.2 8 400.0 175 3.08 3.845 17.05 0 0 3 2  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  Merc 280C 17.8 6 167.6 123 3.92 3.440 18.90 1 0 4 4  Merc 450SL 17.3 8 275.8 180 3.07 3.730 17.60 0 0 3 3  Merc 450SE 16.4 8 275.8 180 3.07 4.070 17.40 0 0 3 3  Ford Pantera L 15.8 8 351.0 264 4.22 3.170 14.50 0 1 5 4  Dodge Challenger 15.5 8 318.0 150 2.76 3.520 16.87 0 0 3 2  Merc 450SLC 15.2 8 275.8 180 3.07 3.780 18.00 0 0 3 3  AMC Javelin 15.2 8 304.0 150 3.15 3.435 17.30 0 0 3 2  Maserati Bora 15.0 8 301.0 335 3.54 3.570 14.60 0 1 5 8  Chrysler Imperial 14.7 8 440.0 230 3.23 5.345 17.42 0 0 3 4  Duster 360 14.3 8 360.0 245 3.21 3.570 15.84 0 0 3 4  Camaro Z28 13.3 8 350.0 245 3.73 3.840 15.41 0 0 3 4  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  >  > #-----------------------------------------------------  > # Step 3: Which car has the “best” combination of mpg and hp?  >  > # Q6) What logic did you use?  > # I ranked both of the mpg and the hp and took with the worst car getting a 1 and the best car  > #getting a 32  >  > # Q7) Which cars?  > # Getting the max score from the number of rows  > bestScore <- dim(myCars)[1]  > # Setting up scoring from 1 to max score  > scores <- 1:bestScore  > # Combining myCars ordered by mpg with the rankings from 1 to 32  > myCars <- cbind(myCars[order(myCars$mpg), ], mpgScore = scores)  > # Combining myCars ordered by hp with the rankings from 1 to 32  > myCars <- cbind(myCars[order(myCars$hp), ], hpScore = scores)  > # Summing the rankings of the two cars  > myCars$finalScore <- myCars$mpgScore + myCars$hpScore  > # Selecting the first score returned by the descending order function and getting the rowname  > # This returns the best car by this scoring method  > (bestCar <- rownames(myCars[order(-myCars$finalScore)[1], ]))  [1] "Lotus Europa"  > # Returns Lotus Europa  >  > #-----------------------------------------------------  > # Step 4: Which car has “best” car combination of mpg and  > # hp, where mpg and hp must be given equal weight?  >  > # Going to standardize the mpg and the hp so there is a mean of 0 and a sd of 1  > # So will  > # First creating a function to feature scale  > standardize <- function(feature){  + #getting the mean  + xbar <- mean(feature)  + # getting the standard deviation  + xsd <- sd(feature)  + #returning the feature subtracted by the minimum and divided by the max - min  + return((feature - xbar) / xsd)  + }  > # Feature scaling mpg  > myCars$mpgStd <- standardize(myCars$mpg)  > # Feature Scaling hp  > myCars$hpStd <- standardize(myCars$hp)  > # Adding the new hp and mpg together  > myCars$finalStdScore <- myCars$mpgStd + myCars$hpStd  > # Getting the best finalScore rowname (aka the car) from descending order funtion  > (bestCar <- rownames(myCars[order(-myCars$finalStdScore)[1], ]))  [1] "Maserati Bora"  > # returns Maserati Bora |