# Homework #2 Submission

## R Script (Code)

#

# Course: IST687

# Name: Joyce Woznica

# Homework 2

# Due Date: 1/20/2019

# Date Submitted:

#

# using mtcars dataset

# store this in a new variable (myCars)

myCars <- mtcars

# adds the row name (which is the car name) as a variable (column)

myCars$CarName <-row.names(myCars)

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

# 1) What is the highest hp?

# ANSWER: 335 hp

maxHP = max(myCars$hp)

# another way is to use

subset(myCars, hp == maxHP)[,"hp"]

# 2) Which car has the highest hp?

# ANSWER: Maserati Bora with 335 hp

# the code below looks for the row where the 'hp' is equal to the maxHP and

# drops all the rows that are not TRUE (the only TRUE value would be the one with the maxHP)

myCars[myCars$hp == maxHP, "hp", drop = FALSE]

# could have also ordered the data descending and picked the top row

myCarsOrderedbyHP <- myCars[order(-myCars$hp),]

head(myCarsOrderedbyHP, n=1)

# Step 2: Explore mpg (miles per gallon)

# 3) What is the highest mpg?

# ANSWER: 33.9 mpg

maxMPG <- max(myCars$mpg)

# 4) Which car as the highest mpg?

# ANSWER: Toyota Corolla with 33.9 mpg

myCars[myCars$mpg == maxMPG, "mpg", drop = FALSE]

# 5) Create a sorted dataframe, based on the mpg

myCarsSortedbyMPG <- myCars[order(myCars$mp),]

# Step 3: which car has the best combination of mpg and hp?

# 6) What logic did you use?

# ANSWER: For this question, I determined the higher the mpg/hp ratio is what

# will be considered the "best combination".

# 7) Which car as the best combination of mpg and hp?

# ANSWER: Honda Civic with a ratio of 0.5846154

# adds the row name (which is the ratio of mpg over hp

myCars$mpg2hp <- myCars$mpg/myCars$hp

# This provides the row with the best mpg2hp

head(myCars[order(-myCars$mpg2hp),],n=1)

# Alternatively, I can locate the max by just finding the only row that matches it

maxMPG2HP <- max(myCars$mpg2hp)

myCars[myCars$mpg2hp == maxMPG2HP, "mpg2hp", drop = FALSE]

# another option would be to use which.max and the CarName variable to determine the correct car

myCars$CarName[which.max(myCars$mpg2hp)]

# Step 4: Which car as the "best" car combination of mpg and hp, where mpg and hp

# must be given equal weight

# DO NOT use a ratio, considering adding hp and mpg (mentioned in class)

# Again, I determined that the largest number when scaled and combined for

# mpg and hp would be considered "best" for this question

# ANSWER: Maserati Bora with the maximum scaled value of 1.901923

myCars$scaled <- scale(myCars$mpg) + scale(myCars$hp)

maxScaled <- max(myCars$scaled)

myCars[myCars$scaled == maxScaled, "scaled", drop = FALSE]

# another option would be to use which.max and the CarName variable to determine the correct car

myCars$CarName[which.max(myCars$scaled)]

## Console Log (Executed Code)

> #

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> # Name: Joyce Woznica

> # Homework 2

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> #

> # using mtcars dataset

> # store this in a new variable (myCars)

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> myCars <- mtcars

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> # adds the row name (which is the car name) as a variable (column)

> myCars$CarName <-row.names(myCars)

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> # Step 1: What is the hp(hp stands for "horse power")

> # 1) What is the highest hp?

> # ANSWER: 335 hp

> maxHP = max(myCars$hp)

> # another way is to use

> subset(myCars, hp == maxHP)[,"hp"]

[1] 335

>

> # 2) Which car has the highest hp?

> # ANSWER: Maserati Bora with 335 hp

> # the code below looks for the row where the 'hp' is equal to the maxHP and

> # drops all the rows that are not TRUE (the only TRUE value would be the one with the maxHP)

> myCars[myCars$hp == maxHP, "hp", drop = FALSE]

hp

Maserati Bora 335

> # could have also ordered the data descending and picked the top row

> myCarsOrderedbyHP <- myCars[order(-myCars$hp),]

> head(myCarsOrderedbyHP, n=1)

mpg cyl disp hp drat wt qsec vs am gear carb CarName

Maserati Bora 15 8 301 335 3.54 3.57 14.6 0 1 5 8 Maserati Bora

>

> # Step 2: Explore mpg (miles per gallon)

> # 3) What is the highest mpg?

> # ANSWER: 33.9 mpg

> maxMPG <- max(myCars$mpg)

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> # 4) Which car as the highest mpg?

> # ANSWER: Toyota Corolla with 33.9 mpg

> myCars[myCars$mpg == maxMPG, "mpg", drop = FALSE]

mpg

Toyota Corolla 33.9

>

> # 5) Create a sorted dataframe, based on the mpg

> myCarsSortedbyMPG <- myCars[order(myCars$mp),]

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> # Step 3: which car has the best combination of mpg and hp?

> # 6) What logic did you use?

> # ANSWER: For this question, I determined the higher the mpg/hp ratio is what

> # will be considered the "best combination".

> # 7) Which car as the best combination of mpg and hp?

> # ANSWER: Honda Civic with a ratio of 0.5846154

> # adds the row name (which is the ratio of mpg over hp

> myCars$mpg2hp <- myCars$mpg/myCars$hp

> # This provides the row with the best mpg2hp

> head(myCars[order(-myCars$mpg2hp),],n=1)

mpg cyl disp hp drat wt qsec vs am gear carb CarName mpg2hp

Honda Civic 30.4 4 75.7 52 4.93 1.615 18.52 1 1 4 2 Honda Civic 0.5846154

> # Alternatively, I can locate the max by just finding the only row that matches it

> maxMPG2HP <- max(myCars$mpg2hp)

> myCars[myCars$mpg2hp == maxMPG2HP, "mpg2hp", drop = FALSE]

mpg2hp

Honda Civic 0.5846154

> # another option would be to use which.max and the CarName variable to determine the correct car

> myCars$CarName[which.max(myCars$mpg2hp)]

[1] "Honda Civic"

>

> # Step 4: Which car as the "best" car combination of mpg and hp, where mpg and hp

> # must be given equal weight

> # DO NOT use a ratio, considering adding hp and mpg (mentioned in class)

> # Again, I determined that the largest number when scaled and combined for

> # mpg and hp would be considered "best" for this question

> # ANSWER: Maserati Bora with the maximum scaled value of 1.901923

> myCars$scaled <- scale(myCars$mpg) + scale(myCars$hp)

> maxScaled <- max(myCars$scaled)

> myCars[myCars$scaled == maxScaled, "scaled", drop = FALSE]

scaled

Maserati Bora 1.901923

> # another option would be to use which.max and the CarName variable to determine the correct car

> myCars$CarName[which.max(myCars$scaled)]

[1] "Maserati Bora"