

Sharat_Sripada_HW2.R

ssharat

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```
#  
# Course: IST-687  
# Name: Sharat Sripada  
# Homework #2  
# Due Date: 1/26/2020  
# Date Submitted: 1/26/2020  
#  
  
data()  
myCars <- mtcars  
  
# Get index of max hp/horse-power  
MaxhpIndex <- which.max(myCars$hp)  
  
# Get the max-hp value  
Maxhpval <- myCars[MaxhpIndex, 4]  
  
# Verify if there are >1 cars with hp equals Maxhpval  
if (length(row.names(myCars[myCars$hp == Maxhpval,]))) > 1) ">1 cars" else "=1  
cars"  
  
## [1] "=1 cars"  
  
# Get the car-name with max-hp  
Maxhpcar <- row.names(myCars[MaxhpIndex,])  
  
# Print the car-name with max-hp & the corresponding hp  
cat(Maxhpcar, "has max hp", Maxhpval)  
  
## Maserati Bora has max hp 335  
  
# Get index of max mpg/mile per gallon  
MaxmpgIndex <- which.max(myCars$mpg)  
  
# Get the max-mpg value  
Maxmpgval <- myCars[MaxmpgIndex, 1]  
  
# Verify if there are >1 cars with hp equals Maxmpgval  
if (length(row.names(myCars[myCars$mpg == Maxmpgval,]))) > 1) ">1 cars" else  
"=1 cars"  
  
## [1] "=1 cars"
```

```
# Get the car-name with max-mpg
```

```
Maxmpgcar <- row.names(myCars[MaxmpgIndex,])
```

```
# Print the car-name with max-mpg & the corresponding hp
```

```
cat(Maxmpgcar, "has max mpg", Maxmpgval)
```

```
## Toyota Corolla has max mpg 33.9
```

```
# Sort based on mpg
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```
myCars[order(myCars$mpg),]
```

```
##      mpg  cyl  disp  hp drat   wt  qsec vs  am  gear  carb
## 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
## Camaro Z28         13.3   8 350.0 245 3.73 3.840 15.41  0  0    3    4
## Duster 360         14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
## Chrysler Imperial 14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
## Maserati Bora       15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
## 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
## Dodge Challenger    15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
## Ford Pantera L      15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    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 280C           17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
## Valiant             18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
## Hornet Sportabout   18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
## 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
## Ferrari Dino        19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
## 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
## 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
## Toyota Corona        21.5   4 120.1  97 3.70 2.465 20.01  1  0    3    1
## 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
## Merc 240D            24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
## Porsche 914-2        26.0   4 120.3  91 4.43 2.140 16.70  0  1    5    2
## Fiat X1-9            27.3   4  79.0  66 4.08 1.935 18.90  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 128             32.4   4  78.7  66 4.08 2.200 19.47  1  1    4    1
## Toyota Corolla       33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
```

```
# Logic-1: Use a combination of (mpg, hp) to order the data -> pick the middle value
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```
# Order the data
```

```
newdata <- myCars[order(myCars$mpg, myCars$hp),]
```

```

# Select the middle value and print the car-name
newdata[length(row.names(myCars))/2,]

##           mpg cyl  disp  hp drat   wt  qsec vs am gear carb
## Merc 280 19.2   6 167.6 123 3.92 3.44 18.3  1  0    4    4

row.names(newdata[length(row.names(myCars))/2,])

## [1] "Merc 280"

# Logic-2: Calculate a ratio of mpg/hp & create a new column -> order it ->
pick the middle value

# Create a new column with ratio mpg/hp
myCars$MpgHpRatio <- myCars$mpg/myCars$hp

# Order the data
newdata <- myCars[order(myCars$MpgHpRatio), ]

# Select the middle value and print the car-name
newdata[length(row.names(myCars))/2,]

##           mpg cyl  disp  hp drat   wt  qsec vs am gear carb MpgHpRatio
## Merc 280C 17.8   6 167.6 123 3.92 3.44 18.9  1  0    4    4 0.1447154

row.names(newdata[length(row.names(myCars))/2,])

## [1] "Merc 280C"

# Using scale in its default form to normalize the mpg and hp columns
# Scale functionality:
#  $Z\text{-score} = (x - u) / SD$ 
myCars$mpgscale <- scale(myCars$mpg)
myCars$hpscale <- scale(myCars$hp)

# Order based on column mpgscale, hpscale
newdata <- myCars[order(myCars$mpgscale, myCars$hpscale),]

# Select the middle value and print the car-name
newdata[length(row.names(myCars))/2,]

##           mpg cyl  disp  hp drat   wt  qsec vs am gear carb MpgHpRatio
## Merc 280 19.2   6 167.6 123 3.92 3.44 18.3  1  0    4    4 0.1560976
##           mpgscale  hpscale
## Merc 280 -0.1477738 -0.3454858

row.names(newdata[length(row.names(myCars))/2,])

## [1] "Merc 280"

```