hw_02

Evelin Reyes

10/5/2021

HOMEWORK 2

Q1 (2 points) Fix each of the following common data frame subsetting errors:

1 mtcars[mtcars$cyl < 6]

2 mtcars[-1:3,]

3 mtcars[mtcars$cyl = 8,]

4 mtcars[mtcars$cyl == 4 | 6,]

1 Answer

```
mtcars[mtcars$cyl < 6,]
```

```
##                    mpg cyl  disp  hp drat    wt  qsec vs am gear carb
## Datsun 710        22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
## 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
## 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
## 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
## Volvo 142E        21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
```

2 Answer

```
x <- mtcars[-c(1:3), ]
```

3 Answer

```
x <- mtcars[mtcars$cyl == 8, ]
```

4 Answer

```
x <- mtcars[mtcars$cyl == 4 | mtcars$cyl == 6, ]
```

Q2 (1 point) Why does the following code generated five missing values?

x = 1:5

x[NA]

Answer

Using "NA" command on dataframe X tells R to display "NA" for each of the five values that you

specified when first creating the X dataframe.

Q3 (2 points) Why does mtcars[1:15] return an error? How does it differ from mtcars[1:15,]?

Answer

Running mtcars[1:15] gives an error because the code does not specify which column you want R to pull the data from.

Q4 (2 points) Explain how does the following code work.

x = matrix(c(1:3, NA, 5:7, NA, NA), nrow = 3)

x[is.na(x)] = 0

Answer

The first line of code creates a 3x3 matrix with missing values for positions 4, 8, and 9

the next second line of code assigned the value of 0 for any missing values in data matrix X

Q5 (3 points) Load the Car Road Tests dataset (in R, run data("mtcars"), ?mtcars), then add a new column named as mpg_2 for the mtcars data frame.

You can use if … else … or ifelse or any other functions that can get the job done.

This new column will categorize mpg into four categories using the thresholds below:

Answer

data("mtcars") ?mtcars

```
mpg2<-
   ifelse(mtcars$mpg < 16, "low",
         ifelse(mtcars$mpg < 21, "Low_intermediate",
                ifelse(mtcars$mpg < 26, "Intermediate_high", "High")))

mpg2
```

```
##  [1] "Intermediate_high" "Intermediate_high" "Intermediate_high"
##  [4] "Intermediate_high" "Low_intermediate"  "Low_intermediate"
##  [7] "low"               "Intermediate_high" "Intermediate_high"
## [10] "Low_intermediate"  "Low_intermediate"  "Low_intermediate"
## [13] "Low_intermediate"  "low"               "low"
## [16] "low"               "low"               "High"
## [19] "High"              "High"              "Intermediate_high"
## [22] "low"               "low"               "low"
## [25] "Low_intermediate"  "High"              "High"
## [28] "High"              "low"               "Low_intermediate"
## [31] "low"               "Intermediate_high"
```

```
newmtcars=data.frame(mpg2,mtcars)
newmtcars
```

```
##                                mpg2  mpg cyl disp  hp drat    wt  qsec vs am
## Mazda RX4           Intermediate_high 21.0   6 160.0 110 3.90 2.620 16.46  0  1
## Mazda RX4 Wag       Intermediate_high 21.0   6 160.0 110 3.90 2.875 17.02  0  1
## Datsun 710          Intermediate_high 22.8   4 108.0  93 3.85 2.320 18.61  1  1
## Hornet 4 Drive      Intermediate_high 21.4   6 258.0 110 3.08 3.215 19.44  1  0
## Hornet Sportabout    Low_intermediate 18.7   8 360.0 175 3.15 3.440 17.02  0  0
## Valiant              Low_intermediate 18.1   6 225.0 105 2.76 3.460 20.22  1  0
## Duster 360                        low 14.3   8 360.0 245 3.21 3.570 15.84  0  0
## Merc 240D           Intermediate_high 24.4   4 146.7  62 3.69 3.190 20.00  1  0
## Merc 230            Intermediate_high 22.8   4 140.8  95 3.92 3.150 22.90  1  0
## Merc 280             Low_intermediate 19.2   6 167.6 123 3.92 3.440 18.30  1  0
## Merc 280C            Low_intermediate 17.8   6 167.6 123 3.92 3.440 18.90  1  0
## Merc 450SE           Low_intermediate 16.4   8 275.8 180 3.07 4.070 17.40  0  0
## Merc 450SL           Low_intermediate 17.3   8 275.8 180 3.07 3.730 17.60  0  0
## Merc 450SLC                       low 15.2   8 275.8 180 3.07 3.780 18.00  0  0
## Cadillac Fleetwood                low 10.4   8 472.0 205 2.93 5.250 17.98  0  0
## Lincoln Continental               low 10.4   8 460.0 215 3.00 5.424 17.82  0  0
## Chrysler Imperial                 low 14.7   8 440.0 230 3.23 5.345 17.42  0  0
## Fiat 128                         High 32.4   4  78.7  66 4.08 2.200 19.47  1  1
## Honda Civic                      High 30.4   4  75.7  52 4.93 1.615 18.52  1  1
## Toyota Corolla                   High 33.9   4  71.1  65 4.22 1.835 19.90  1  1
## Toyota Corona       Intermediate_high 21.5   4 120.1  97 3.70 2.465 20.01  1  0
## Dodge Challenger                  low 15.5   8 318.0 150 2.76 3.520 16.87  0  0
## AMC Javelin                       low 15.2   8 304.0 150 3.15 3.435 17.30  0  0
## Camaro Z28                        low 13.3   8 350.0 245 3.73 3.840 15.41  0  0
## Pontiac Firebird     Low_intermediate 19.2   8 400.0 175 3.08 3.845 17.05  0  0
## Fiat X1-9                        High 27.3   4  79.0  66 4.08 1.935 18.90  1  1
## Porsche 914-2                    High 26.0   4 120.3  91 4.43 2.140 16.70  0  1
## Lotus Europa                     High 30.4   4  95.1 113 3.77 1.513 16.90  1  1
## Ford Pantera L                    low 15.8   8 351.0 264 4.22 3.170 14.50  0  1
## Ferrari Dino         Low_intermediate 19.7   6 145.0 175 3.62 2.770 15.50  0  1
## Maserati Bora                     low 15.0   8 301.0 335 3.54 3.570 14.60  0  1
## Volvo 142E          Intermediate_high 21.4   4 121.0 109 4.11 2.780 18.60  1  1
##                   gear carb
## Mazda RX4            4    4
## Mazda RX4 Wag        4    4
## Datsun 710           4    1
## Hornet 4 Drive       3    1
## Hornet Sportabout    3    2
## Valiant              3    1
## Duster 360           3    4
## Merc 240D            4    2
## Merc 230             4    2
## Merc 280             4    4
## Merc 280C            4    4
## Merc 450SE           3    3
## Merc 450SL           3    3
## Merc 450SLC          3    3
## Cadillac Fleetwood   3    4
## Lincoln Continental  3    4
## Chrysler Imperial    3    4
## Fiat 128             4    1
## Honda Civic          4    2
```

```
## Toyota Corolla       4     1
## Toyota Corona        3     1
## Dodge Challenger     3     2
## AMC Javelin          3     2
## Camaro Z28           3     4
## Pontiac Firebird     3     2
## Fiat X1-9            4     1
## Porsche 914-2        5     2
## Lotus Europa         5     2
## Ford Pantera L       5     4
## Ferrari Dino         5     6
## Maserati Bora        5     8
## Volvo 142E           4     2
```