## hw 02

## DerekRBratcher

## 10/4/2021

1. (2 points) Fix each of the following common data frame subsetting errors:

```
#fix mtcars[mtcars$cyl < 6]
subset(mtcars, cyl < 6)</pre>
##
                   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
## Merc 240D
                  24.4
                         4 146.7
                                   62 3.69 3.190 20.00
## Merc 230
                  22.8
                         4 140.8
                                   95 3.92 3.150 22.90
## Fiat 128
                  32.4
                            78.7
                                   66 4.08 2.200 19.47
                                                                      1
                  30.4
## Honda Civic
                            75.7
                                   52 4.93 1.615 18.52
## Toyota Corolla 33.9
                           71.1
                                   65 4.22 1.835 19.90
                         4
                                                         1
                                                                      1
## Toyota Corona
                  21.5
                         4 120.1
                                   97 3.70 2.465 20.01
                                                            0
                                                                      1
                                                         1
## Fiat X1-9
                                                                      1
                  27.3
                         4 79.0
                                   66 4.08 1.935 18.90
## Porsche 914-2
                  26.0
                         4 120.3 91 4.43 2.140 16.70
                                                                      2
                                                                      2
## Lotus Europa
                  30.4
                         4 95.1 113 3.77 1.513 16.90
## Volvo 142E
                  21.4
                          4 121.0 109 4.11 2.780 18.60
mtcars[mtcars$cyl < 6, ]</pre>
                   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
## Merc 240D
                  24.4
                         4 146.7
                                   62 3.69 3.190 20.00
                                                                      2
                                                                      2
## Merc 230
                  22.8
                         4 140.8
                                   95 3.92 3.150 22.90
## Fiat 128
                  32.4
                            78.7
                                   66 4.08 2.200 19.47
                                                                      1
## Honda Civic
                  30.4
                            75.7
                                   52 4.93 1.615 18.52
## Toyota Corolla 33.9
                                   65 4.22 1.835 19.90
                            71.1
                                                                      1
## Toyota Corona
                  21.5
                         4 120.1
                                   97 3.70 2.465 20.01
                                                                      1
## Fiat X1-9
                  27.3
                         4 79.0
                                   66 4.08 1.935 18.90
                                                                      1
                                                         1
## Porsche 914-2
                  26.0
                          4 120.3 91 4.43 2.140 16.70
                                                                      2
                                                                      2
## Lotus Europa
                  30.4
                         4 95.1 113 3.77 1.513 16.90
                                                         1
## Volvo 142E
                  21.4
                         4 121.0 109 4.11 2.780 18.60
# mtcars[-1:3,]
mtcars[-c(1:3),]
##
                        mpg cyl disp hp drat
                                                   wt
                                                        qsec vs am gear carb
## Hornet 4 Drive
                       21.4
                               6 258.0 110 3.08 3.215 19.44
                                                                      3
                                                                            1
                               8 360.0 175 3.15 3.440 17.02
                                                                            2
## Hornet Sportabout
                        18.7
```

6 225.0 105 2.76 3.460 20.22

1

18.1

## Valiant

```
## Duster 360
                       14.3
                              8 360.0 245 3.21 3.570 15.84
## Merc 240D
                       24.4
                              4 146.7 62 3.69 3.190 20.00
                                                                          2
                                                            1
                                                               0
## Merc 230
                       22.8
                              4 140.8 95 3.92 3.150 22.90
## Merc 280
                       19.2
                              6 167.6 123 3.92 3.440 18.30
                                                                          4
                                                               Ω
## Merc 280C
                       17.8
                              6 167.6 123 3.92 3.440 18.90
                                                                     4
                                                                          4
                              8 275.8 180 3.07 4.070 17.40
                                                            0
                                                               Λ
                                                                    3
                                                                          3
## Merc 450SE
                       16.4
                              8 275.8 180 3.07 3.730 17.60
## Merc 450SL
                       17.3
                              8 275.8 180 3.07 3.780 18.00
                                                                    3
## Merc 450SLC
                       15.2
                                                            0
                                                               0
                                                                          3
## Cadillac Fleetwood 10.4
                              8 472.0 205 2.93 5.250 17.98
                                                            Ω
                                                               Λ
                                                                    3
                                                                          4
                                                                    3
## Lincoln Continental 10.4
                              8 460.0 215 3.00 5.424 17.82
                                                               0
## Chrysler Imperial
                     14.7
                              8 440.0 230 3.23 5.345 17.42
## Fiat 128
                       32.4
                              4 78.7 66 4.08 2.200 19.47
                                                                    4
                                                            1
                                                               1
                                                                          1
## Honda Civic
                       30.4
                                 75.7
                                       52 4.93 1.615 18.52
                                                            1
                                                               1
                                                                    4
                                                                          2
                                                                    4
## Toyota Corolla
                       33.9
                              4 71.1 65 4.22 1.835 19.90
                       21.5
                              4 120.1 97 3.70 2.465 20.01
                                                               0
                                                                    3
## Toyota Corona
                                                            1
                                                                          1
## Dodge Challenger
                       15.5
                              8 318.0 150 2.76 3.520 16.87
                                                            0
                                                               0
                                                                    3
                                                            0
                                                                    3
                                                                          2
## AMC Javelin
                       15.2
                              8 304.0 150 3.15 3.435 17.30
                                                               0
## Camaro Z28
                       13.3
                              8 350.0 245 3.73 3.840 15.41
                                                                    3
## Pontiac Firebird
                       19.2
                              8 400.0 175 3.08 3.845 17.05
                                                                    3
                                                            0
                                                               0
                                                                          2
## Fiat X1-9
                       27.3
                              4 79.0 66 4.08 1.935 18.90
                                                            1
                                                                    4
                                                                          1
## Porsche 914-2
                       26.0
                              4 120.3 91 4.43 2.140 16.70
                                                            Ω
                                                               1
                                                                    5
                                                                          2
## Lotus Europa
                       30.4
                              4 95.1 113 3.77 1.513 16.90
## Ford Pantera L
                              8 351.0 264 4.22 3.170 14.50 0 1
                                                                    5
                       15.8
                                                                          4
                       19.7
                              6 145.0 175 3.62 2.770 15.50
                                                            0
                                                                    5
                                                                          6
## Ferrari Dino
## Maserati Bora
                              8 301.0 335 3.54 3.570 14.60
                                                                     5
                                                                          8
                       15.0
                                                               1
## Volvo 142E
                       21.4
                              4 121.0 109 4.11 2.780 18.60
# mtcars[mtcars$cyl = 8, ]
mtcars[mtcars$cyl == 8, ]
##
                        mpg cyl disp hp drat
                                                  wt qsec vs am gear carb
## Hornet Sportabout
                       18.7
                              8 360.0 175 3.15 3.440 17.02
## Duster 360
                       14.3
                              8 360.0 245 3.21 3.570 15.84
                                                                          4
                       16.4
## Merc 450SE
                              8 275.8 180 3.07 4.070 17.40
                                                                    3
                                                                          3
                                                            0
                                                               0
## Merc 450SL
                       17.3
                              8 275.8 180 3.07 3.730 17.60
                                                                          3
## Merc 450SLC
                       15.2
                              8 275.8 180 3.07 3.780 18.00
                                                            0
                                                               Λ
                                                                    3
                                                                          3
## Cadillac Fleetwood 10.4
                              8 472.0 205 2.93 5.250 17.98
                                                                    3
                                                                          4
## Lincoln Continental 10.4
                              8 460.0 215 3.00 5.424 17.82
                                                            0
                                                                    3
                                                                          4
                                                               Ω
## Chrysler Imperial 14.7
                              8 440.0 230 3.23 5.345 17.42
## Dodge Challenger
                       15.5
                              8 318.0 150 2.76 3.520 16.87
                                                            0
                                                               Ω
                                                                    3
## AMC Javelin
                       15.2
                              8 304.0 150 3.15 3.435 17.30
                                                            Ω
                                                               Λ
                                                                    3
                                                                          2
## Camaro Z28
                       13.3
                              8 350.0 245 3.73 3.840 15.41
                                                            0
                                                               0
                                                                    3
                                                                          4
                                                                          2
## Pontiac Firebird
                       19.2
                              8 400.0 175 3.08 3.845 17.05
                       15.8
                              8 351.0 264 4.22 3.170 14.50
                                                                    5
                                                                          4
## Ford Pantera L
                                                            0
                                                               1
                              8 301.0 335 3.54 3.570 14.60
## Maserati Bora
                       15.0
# mtcars[mtcars$cyl == 4 | 6, ]
mtcars[mtcars$cyl != 8, ]
##
                   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
## Mazda RX4 Wag 21.0
                         6 160.0 110 3.90 2.875 17.02 0 1
```

4 108.0 93 3.85 2.320 18.61 1 1

22.8

## Datsun 710

```
## Hornet 4 Drive 21.4
                           6 258.0 110 3.08 3.215 19.44
                                                                    3
                                                            1
                                                                          1
                   18.1
## Valiant
                           6 225.0 105 2.76 3.460 20.22
                                                            1
                                                               0
                                                                    3
                                                                          1
                                     62 3.69 3.190 20.00
## Merc 240D
                   24.4
                                                                          2
                   22.8
                                    95 3.92 3.150 22.90
                                                                          2
## Merc 230
                           4 140.8
                                                            1
                                                               0
## Merc 280
                   19.2
                           6 167.6 123 3.92 3.440 18.30
                                                            1
                                                               0
                                                                    4
                                                                          4
## Merc 280C
                           6 167.6 123 3.92 3.440 18.90
                                                               0
                                                                          4
                   17.8
                                                            1
## Fiat 128
                   32.4
                              78.7
                                     66 4.08 2.200 19.47
                                                            1
                                                                          1
## Honda Civic
                   30.4
                           4
                              75.7
                                     52 4.93 1.615 18.52
                                                            1
                                                                          2
## Toyota Corolla 33.9
                           4
                              71.1
                                     65 4.22 1.835 19.90
                                                                    4
                                                                          1
                                                            1
                                                               1
## Toyota Corona
                   21.5
                           4 120.1
                                     97 3.70 2.465 20.01
                                                            1
                                                                    3
                                                                          1
## Fiat X1-9
                   27.3
                              79.0
                                     66 4.08 1.935 18.90
                                                                    4
                                                                          1
                                                            1
                                                                          2
                   26.0
## Porsche 914-2
                           4 120.3
                                    91 4.43 2.140 16.70
                                                            0
                                                                    5
                   30.4
## Lotus Europa
                              95.1 113 3.77 1.513 16.90
                                                                    5
                                                                          2
                                                            1
                                                                          6
## Ferrari Dino
                   19.7
                           6 145.0 175 3.62 2.770 15.50
                                                                    5
                                                                          2
## Volvo 142E
                   21.4
                           4 121.0 109 4.11 2.780 18.60
```

mtcars[mtcars\$cyl == c(4, 6), ]

```
##
                    mpg cyl disp hp drat
                                                                gear carb
                                                wt
                                                    qsec vs
                                                            am
                                                                         4
## Mazda RX4 Wag
                   21.0
                          6 160.0 110 3.90 2.875 17.02
                                                          0
                                                              1
## Datsun 710
                   22.8
                          4 108.0
                                    93 3.85 2.320 18.61
                                                                         1
## Hornet 4 Drive 21.4
                          6 258.0 110 3.08 3.215 19.44
                                                                         1
                                                           1
                                                                   3
## Valiant
                   18.1
                          6 225.0 105 2.76 3.460 20.22
                                                           1
                                                              0
                                                                   3
                                                                         1
## Merc 230
                   22.8
                          4 140.8
                                    95 3.92 3.150 22.90
                                                                         2
## Merc 280
                   19.2
                          6 167.6 123 3.92 3.440 18.30
                                                                         4
                                                           1
                                                              0
                                                                         2
## Honda Civic
                   30.4
                          4
                             75.7
                                    52 4.93 1.615 18.52
                                                           1
## Toyota Corona
                   21.5
                          4 120.1
                                    97 3.70 2.465 20.01
                                                           1
                                                              0
                                                                   3
                                                                         1
                                                                         2
## Porsche 914-2
                   26.0
                          4 120.3
                                    91 4.43 2.140 16.70
## Ferrari Dino
                   19.7
                          6 145.0 175 3.62 2.770 15.50
                                                                         6
```

- 2. (1 point) Why does the following code generated five missing values? x = 1:5; x[NA] NA in, NA out I created a vector using numbers 1-5 then applied the logical constant NA to vector X the above commands executed the equivalent of is.na<- x setting all elements of x (from first argument) to NA(with second argument)</p>
- 3. (2 points) Why does mtcars[1:15] return an error? How does it differ from mtcars[1:15, ]? the first argument mtcars[1:15] specifies the dataset but not the variable/observation. the first argument lacks a comma designating 1-15 as the specific observations or variables depending on placement. mtcars[1:15, ] specifies selection of the first 15 observations of the mtcars dataset along with their corresponding variables
- 4. (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
```

In R a matrix must be a two dimensional data structure of homgenous elements. first x was set as a matrix with 3 rows and based on the elements provided the length was inferred by prioritizing the dimensions then the data. with 9 elements and three rows specified 3 columns was determined. because byrow wasnt specified (byrow = TRUE) the matrix was filled columnwise. then with is.na(x) all NA values of matrix X were designated as zero

5. (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:mpg\_2 (low- mpg<16, low\_intermediate  $16 \le mpg < 21$ , intermediate\_high  $21 \le mpg < 26$ ,high  $26 \le mpg$ )

```
mtcars |> dplyr::mutate(mpg_2 = dplyr::case_when(
   mtcars$mpg < 16 ~ "low",
   mtcars$mpg < 21 ~ "low_intermediate",
   mtcars$mpg < 25 ~ "intermediate_high",
   mtcars$mpg >= 26 ~ "high",
   TRUE ~ "A"
))
```

```
mpg cyl disp hp drat
##
                                                    wt gsec vs am gear carb
## Mazda RX4
                        21.0
                               6 160.0 110 3.90 2.620 16.46
                                                                            4
## Mazda RX4 Wag
                               6 160.0 110 3.90 2.875 17.02
                        21.0
                        22.8
                                                                       4
## Datsun 710
                               4 108.0 93 3.85 2.320 18.61
                                                                            1
                                                               1
## Hornet 4 Drive
                        21.4
                               6 258.0 110 3.08 3.215 19.44
                                                                       3
                                                                            1
## Hornet Sportabout
                        18.7
                               8 360.0 175 3.15 3.440 17.02
                                                                       3
                                                                            2
                                                              0
                                                                  0
## Valiant
                        18.1
                               6 225.0 105 2.76 3.460 20.22
                                                                            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
                                                                       4
                                                                            2
                                                                  0
## Merc 280
                        19.2
                               6 167.6 123 3.92 3.440 18.30
                                                                       4
                                                                            4
                                                                  0
                               6 167.6 123 3.92 3.440 18.90
## Merc 280C
                        17.8
                                                                  0
                                                                       4
                                                                            4
                                                                       3
## Merc 450SE
                        16.4
                               8 275.8 180 3.07 4.070 17.40
                                                              0
                                                                  0
                                                                            3
                                                                       3
                                                                            3
## Merc 450SL
                        17.3
                               8 275.8 180 3.07 3.730 17.60
                                                                  0
## 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
                                                               0
                                                                       3
## Lincoln Continental 10.4
                               8 460.0 215 3.00 5.424 17.82
                                                                  0
                                                                            4
## Chrysler Imperial
                        14.7
                               8 440.0 230 3.23 5.345 17.42
                                                                       3
## Fiat 128
                        32.4
                                  78.7
                                        66 4.08 2.200 19.47
                                                                       4
                                                                            1
                                                               1
                                                                  1
## Honda Civic
                        30.4
                                  75.7
                                        52 4.93 1.615 18.52
                                                                       4
                                                                            2
## Toyota Corolla
                        33.9
                               4 71.1
                                        65 4.22 1.835 19.90
                                                                       4
                                                                            1
                                                               1
                                                                  1
## Toyota Corona
                               4 120.1 97 3.70 2.465 20.01
                                                                       3
                        21.5
## Dodge Challenger
                               8 318.0 150 2.76 3.520 16.87
                                                                       3
                                                                            2
                        15.5
                                                               0
                                                                  0
## AMC Javelin
                        15.2
                               8 304.0 150 3.15 3.435 17.30
                                                                       3
                                                                            2
## Camaro Z28
                               8 350.0 245 3.73 3.840 15.41
                                                                       3
                                                                            4
                        13.3
                                                                  0
                                                                            2
## Pontiac Firebird
                        19.2
                               8 400.0 175 3.08 3.845 17.05
## Fiat X1-9
                        27.3
                               4 79.0 66 4.08 1.935 18.90
                                                                       4
                                                              1
                                                                  1
                                                                            1
## Porsche 914-2
                        26.0
                               4 120.3 91 4.43 2.140 16.70
                                                              0
                                                                       5
                                                                            2
## Lotus Europa
                        30.4
                               4 95.1 113 3.77 1.513 16.90
                                                                       5
                                                                            2
## Ford Pantera L
                        15.8
                               8 351.0 264 4.22 3.170 14.50
                                                              0
                                                                       5
                                                                            4
                               6 145.0 175 3.62 2.770 15.50
                                                                       5
## Ferrari Dino
                        19.7
                                                              0
                                                                  1
                                                                            6
## Maserati Bora
                        15.0
                               8 301.0 335 3.54 3.570 14.60
                                                              0
                                                                       5
                                                                            8
                                                                  1
                                                                            2
## Volvo 142E
                        21.4
                               4 121.0 109 4.11 2.780 18.60
##
                                    mpg_2
## Mazda RX4
                        intermediate_high
## Mazda RX4 Wag
                        intermediate_high
## Datsun 710
                        intermediate high
## Hornet 4 Drive
                        intermediate_high
## Hornet Sportabout
                         low intermediate
## Valiant
                         low_intermediate
## Duster 360
## Merc 240D
                        intermediate_high
```

```
## Merc 230
                        intermediate high
## Merc 280
                         low_intermediate
                         low intermediate
## Merc 280C
## Merc 450SE
                         low_intermediate
                         low_intermediate
## Merc 450SL
## Merc 450SLC
                                      low
## Cadillac Fleetwood
                                      low
## Lincoln Continental
                                      low
## Chrysler Imperial
                                      low
## Fiat 128
                                     high
## Honda Civic
                                     high
## Toyota Corolla
                                     high
## Toyota Corona
                        intermediate_high
## Dodge Challenger
                                      low
## AMC Javelin
                                      low
## Camaro Z28
                                      low
## Pontiac Firebird
                         low_intermediate
## Fiat X1-9
                                     high
## Porsche 914-2
                                     high
## Lotus Europa
                                     high
## Ford Pantera L
                                      low
## Ferrari Dino
                         low_intermediate
## Maserati Bora
                                      low
## Volvo 142E
                        intermediate high
mtcars3 <- mtcars |> dplyr::mutate( mpg2= (mtcars$mpg))
mtcars3$mpg2 <-
  ifelse(mtcars3$mpg2 < 16, "low",</pre>
ifelse(mtcars3$mpg2 < 20, "low_intermediate",</pre>
ifelse(mtcars3$mpg2 < 25, "intermediate_high",</pre>
ifelse(mtcars3$mpg2 < 34, "high", mtcars3$mpg2))))</pre>
mtcars3
##
                                                    wt qsec vs am gear carb
                         mpg cyl disp hp drat
## Mazda RX4
                               6 160.0 110 3.90 2.620 16.46
                        21.0
                                                               0
                                                                  1
## Mazda RX4 Wag
                        21.0
                               6 160.0 110 3.90 2.875 17.02
## Datsun 710
                        22.8
                               4 108.0 93 3.85 2.320 18.61
                                                                            1
                                                                 1
## Hornet 4 Drive
                        21.4
                               6 258.0 110 3.08 3.215 19.44
                                                                            1
## Hornet Sportabout
                               8 360.0 175 3.15 3.440 17.02
                                                                            2
                        18.7
                                                               0
                                                                  0
## 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
                                                                       3
                                                                            4
## Merc 240D
                        24.4
                               4 146.7 62 3.69 3.190 20.00
                                                                  0
                                                               1
```

4 71.1 65 4.22 1.835 19.90 1

4 140.8 95 3.92 3.150 22.90

6 167.6 123 3.92 3.440 18.30

6 167.6 123 3.92 3.440 18.90

8 275.8 180 3.07 4.070 17.40

8 275.8 180 3.07 3.730 17.60

8 275.8 180 3.07 3.780 18.00

8 472.0 205 2.93 5.250 17.98 8 460.0 215 3.00 5.424 17.82

8 440.0 230 3.23 5.345 17.42

66 4.08 2.200 19.47

52 4.93 1.615 18.52 1

4

4

3

3

3

3

3

4

1 0

1 0

0 0

0 0

0 0

0 0

1 1

0

2

4

3

3

3

4

4

1

2

1

## Merc 230

## Merc 280

## Merc 280C

## Merc 450SE

## Merc 450SL

## Fiat 128

## Honda Civic

## Toyota Corolla

## Merc 450SLC

## Cadillac Fleetwood 10.4

## Lincoln Continental 10.4

## Chrysler Imperial

22.8

19.2

17.8

16.4

17.3

15.2

14.7

32.4

30.4

33.9

4 78.7

4 75.7

```
## Toyota Corona
                       21.5
                               4 120.1 97 3.70 2.465 20.01
## Dodge Challenger
                       15.5
                               8 318.0 150 2.76 3.520 16.87
                                                                      3
                                                                           2
## AMC Javelin
                                                                           2
                       15.2
                               8 304.0 150 3.15 3.435 17.30
## Camaro Z28
                               8 350.0 245 3.73 3.840 15.41
                                                                      3
                                                                           4
                       13.3
## Pontiac Firebird
                       19.2
                               8 400.0 175 3.08 3.845 17.05
                                                                      3
                                                                           2
## Fiat X1-9
                       27.3
                               4 79.0 66 4.08 1.935 18.90
                                                                      4
                                                                           1
## Porsche 914-2
                               4 120.3 91 4.43 2.140 16.70
                                                                           2
                       26.0
## Lotus Europa
                               4 95.1 113 3.77 1.513 16.90
                                                                      5
                                                                           2
                       30.4
                                                              1
                                                                 1
## Ford Pantera L
                       15.8
                               8 351.0 264 4.22 3.170 14.50
                                                                      5
                                                                           4
## Ferrari Dino
                               6 145.0 175 3.62 2.770 15.50
                                                                      5
                                                                           6
                       19.7
                                                                 1
## Maserati Bora
                       15.0
                               8 301.0 335 3.54 3.570 14.60
                                                                1
                                                                      5
                                                                           8
                               4 121.0 109 4.11 2.780 18.60 1
                                                                           2
## Volvo 142E
                       21.4
                                     mpg2
## Mazda RX4
                       intermediate_high
## Mazda RX4 Wag
                       intermediate_high
## Datsun 710
                       intermediate_high
## Hornet 4 Drive
                       intermediate_high
## Hornet Sportabout
                        low intermediate
## Valiant
                        low_intermediate
## Duster 360
                                      low
## Merc 240D
                       intermediate_high
## Merc 230
                       intermediate_high
## Merc 280
                        low_intermediate
## Merc 280C
                        low intermediate
## Merc 450SE
                        low_intermediate
## Merc 450SL
                        low_intermediate
## Merc 450SLC
                                      low
## Cadillac Fleetwood
                                      low
## Lincoln Continental
                                      low
## Chrysler Imperial
                                      low
## Fiat 128
                                     high
## Honda Civic
                                     high
                                     high
## Toyota Corolla
## Toyota Corona
                       intermediate_high
## Dodge Challenger
                                      low
## AMC Javelin
                                      low
## Camaro Z28
## Pontiac Firebird
                         low_intermediate
## Fiat X1-9
                                     high
## Porsche 914-2
                                     high
## Lotus Europa
                                     high
## Ford Pantera L
                                      low
## Ferrari Dino
                        low_intermediate
## Maserati Bora
                                      low
## Volvo 142E
                       intermediate_high
```