hw_02

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HOMEWORK 2

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

```
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
```

```
x <- mtcars[-c(1:3), ]
x <- mtcars[mtcars$cyl == 8, ]
x <- mtcars[mtcars$cyl == 4 | mtcars$cyl == 6, ]
```

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

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,]?

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.

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.

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

mtcars$mpg_2 = mpg2
mtcars
```

```
##                     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    4
## Mazda RX4 Wag      21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710         22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive     21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
## 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
## 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  1  0    4    2
## Merc 280           19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
## Merc 280C          17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    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 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
## Lincoln Continental 10.4  8 460.0 215 3.00 5.424 17.82  0  0    3    4
## Chrysler Imperial  14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
## 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
## Dodge Challenger   15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
## AMC Javelin        15.2   8 304.0 150 3.15 3.435 17.30  0  0    3    2
## Camaro Z28         13.3   8 350.0 245 3.73 3.840 15.41  0  0    3    4
## Pontiac Firebird   19.2   8 400.0 175 3.08 3.845 17.05  0  0    3    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
## Lotus Europa       30.4   4  95.1 113 3.77 1.513 16.90  1  1    5    2
## Ford Pantera L     15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    4
## Ferrari Dino       19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
## Maserati Bora      15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
## Volvo 142E         21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
##                                  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                          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
## 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
```