Homework_02

Suliat Alli

10/6/2021

Question 1

```
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
```

```
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  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
```

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  0  0    3    2
## Duster 360         14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    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
## 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
## Ford Pantera L     15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    4
## Maserati Bora      15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
```

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

```
##                 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
## Valiant        18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    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
## 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
## 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
## Ferrari Dino   19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
## Volvo 142E     21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
```

Question 2

```r
x = 1:5 # generate a five space vector
x[NA] # filling the spaces with NA
```

```
## [1] NA NA NA NA NA
```

Question 3

```r
#mtcars[1:15]#specifies just the row, undefined column
mtcars[1:15,] # all columns are specified , doesn't return error
```

```
##                      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
```

Question 4

```r
x = matrix(c(1:3, NA, 5:7, NA, NA), nrow = 3) # it generates a 3x3 matrix that consists of 1,2,3,NA,5,6
x[is.na(x)] = 0 # it assigns zero to all cells with NA.
```

Question 5

```r
data("mtcars")

mtcars$mpg_2 <- ifelse(mtcars$mpg <16, 'Low',
                   ifelse(mtcars$mpg >= 16 & mtcars$mpg < 21, 'Low_intermediate',
                       ifelse(mtcars$mpg >= 21 & mtcars$mpg < 26, 'Intermediate_high', 'High')))

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
```