3-Assignment: Manage and Manipulate Data

BIOL 5000

First load a dataset to work with;

```
data(mtcars)
```

Where does this data come from? Is it magic? For reference: library(help = "datasets")

Fix problem with car names not being in a dataframe column

```
library(data.table) #might need to install if not on your computer
mtcar_data <- data.table(mtcars, keep.rownames = TRUE) #can obviously use your
#object name rather than data
mtcar_data #shows dataframe with the car names as column `rn`
```

```
##                     rn  mpg cyl  disp  hp drat    wt  qsec vs am gear carb
##  1:           Mazda RX4 21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4
##  2:       Mazda RX4 Wag 21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
##  3:          Datsun 710 22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
##  4:      Hornet 4 Drive 21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
##  5:   Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
##  6:             Valiant 18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
##  7:          Duster 360 14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
##  8:           Merc 240D 24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
##  9:            Merc 230 22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
## 10:            Merc 280 19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
## 11:           Merc 280C 17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
## 12:          Merc 450SE 16.4   8 275.8 180 3.07 4.070 17.40  0  0    3    3
## 13:          Merc 450SL 17.3   8 275.8 180 3.07 3.730 17.60  0  0    3    3
## 14:         Merc 450SLC 15.2   8 275.8 180 3.07 3.780 18.00  0  0    3    3
## 15:  Cadillac Fleetwood 10.4   8 472.0 205 2.93 5.250 17.98  0  0    3    4
## 16: Lincoln Continental 10.4   8 460.0 215 3.00 5.424 17.82  0  0    3    4
## 17:   Chrysler Imperial 14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
## 18:            Fiat 128 32.4   4  78.7  66 4.08 2.200 19.47  1  1    4    1
## 19:         Honda Civic 30.4   4  75.7  52 4.93 1.615 18.52  1  1    4    2
## 20:      Toyota Corolla 33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
## 21:       Toyota Corona 21.5   4 120.1  97 3.70 2.465 20.01  1  0    3    1
## 22:    Dodge Challenger 15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
## 23:         AMC Javelin 15.2   8 304.0 150 3.15 3.435 17.30  0  0    3    2
## 24:          Camaro Z28 13.3   8 350.0 245 3.73 3.840 15.41  0  0    3    4
## 25:    Pontiac Firebird 19.2   8 400.0 175 3.08 3.845 17.05  0  0    3    2
## 26:           Fiat X1-9 27.3   4  79.0  66 4.08 1.935 18.90  1  1    4    1
## 27:       Porsche 914-2 26.0   4 120.3  91 4.43 2.140 16.70  0  1    5    2
## 28:        Lotus Europa 30.4   4  95.1 113 3.77 1.513 16.90  1  1    5    2
## 29:      Ford Pantera L 15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    4
## 30:        Ferrari Dino 19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
```

```
## 31:       Maserati Bora 15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
## 32:          Volvo 142E 21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
##                     rn  mpg cyl  disp  hp drat    wt  qsec vs am gear carb
```

1. What are at least 2 different ways to view the 'mtcars' dataset?
2. How do you determine the different types of data contained in mtcars?
3. Assign the mtcars dataset to a new object.

Using our knowledge of dplyr, answer the following: I recommend usings 'pipes' where possible (but not required), as they are more intuitive. Assign each answer to a new object (e.g. quest4, quest5, etc.)

4. What is the mean and standard deviation of horsepower (hp)for each group of cars, as measured by their number of cylinders (cyl)?
5. Of the cars having 8 cylinders, which six have the most horsepower? (show just the top 6)
6. Produce a table of fuel efficiency (mpg) for 4-cylinder cars ranked best to worst.
7. List the cars that have fuel efficiency (mpg) greater than or equal to 21 miles per gallon and horsepower (hp) greater than 100.
8. What are the top 10 cars in ratio of horsepower (hp) to fuel-efficiency (mpg)?

#Turn in a properly formatted script file for your answers. I am going to run the #entire script as one chunk of code, and if it doesn't work, I won't grade it. #You need to make it bullet-proof for your 'collaborator' (me). #Review Beckerman Section 3.3.5 for reference. #OK to collaborate with others, but don't let people sponge off your hard work. #Due one week from today (before class) via D2L Assignments submission box.