CP6_Assignment_2_instructions

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Exercises about Lists and Dataframes!

Exercise 1

Make two vectors, `elevens` and `twelves`: - `elevens` is a vector of elements 0, 11, 22, 33,. . . , 121 - `twelves` is a vector of elements 0, 12, 24, 36,. . . , 144

Now, combine the vectors with `c()` to form `numVector` and place them in a list with `list()`.

Notice the difference between combining vectors and placing vectors in a list, think about why the `length()` of each object is different.

Exercise 2

Make a list, `aboutMe`, containing the elements below in the order in which they appear:

- your name as a `character` vector
- a vector containing 3 of your favorite colors, as character vectors, `"yellow"` for example
- a logical object, indicating if the following is True or False: I am excited about Bootcamp next week!
- finally, your favorite number, or the "best" number you can think of

Exercise 3

Make a matrix, design it however you would like. Add the matrix to your `aboutMe` list, in the last position. *Not replaceing the 4th element from above, but adding it as a new 5th element*

Exercise 4

Write a function, `typeofReport`. Use your new found skills with flow control, loops namely, such that your function, receiving a list as input, will return a vector describing the type of each element from the input list.

```
typeofReport(aboutMe) [1] "character" "character" "logical"   "double"    "double"
```

Dataframes!

Exercise 1

Copy `mtcars`, the built in dataframe, to your own variable name `msspCars`. Open the mtcars documentation, `?mtcars` and read about what each column in mtcars represents. Rename all columns in `msspCars` to better names that make sense to you.

Exercise 2

Lets augment our dataframe some. Add the following columns and use the exact names given below for your new columns. '

- `weightActual`: `weight` 1000, weight in lbs, instead of 1000s of lbs
- `powerToWeight`: `power/weightActual`, indicating how much oomph each vehicle has per pound.

Exercise 3

Create the following two subsets of `msspCars`: - `fastCars`: including only cars with a quarter mile time of less than 17 seconds. - `heavyCars`: including only cars with weight more than 4000 pounds.

Use either `subset()` or `[]` notation, remember dataframes need a dual reference `[x,y]`. If you want all columns about rows that meet a specific condition, use `[x,]` leaving the column index blank.

Exercise 4

Add a row to `msspCars`, about the 2002 Ford Focus, one of your TA's first car. The Ford Focus has the following properties:

- miles per gallon: 33.7
- cylinders: 4
- displacement: 120
- horsepower: 112
- read axle ratio: NA (I couldn't find this stat online)
- weight: 2.535
- quarter mile time: 15.4
- in line engine - 5 gear forward transmission
- a single carburetor
- actual weight: 2535
- power to weight ratio of: 112/2535

Once you've added your new row, be sure to name it "Ford Focus" accordingly.