

Assignment 2 - CT5102

Lists and Functions

The goal of this assignment is to implement a function that will generate a list from a data frame, using the knowledge that a data frame is also a list. The **for** loop structure must be used, and also knowledge of how names can be used to subset lists. For example:

```
names(mtcars)
```

```
## [1] "mpg" "cyl" "disp" "hp" "drat" "wt" "qsec" "vs" "am" "gear"
## [11] "carb"
```

Also, the length of the list should be the number of data points in the data frame. For example:

```
length(mtcars[["mpg"]])
```

```
## [1] 32
```

The function should be tested on a number of data frames: **mtcars** and **Formaldehyde**. The output list should have one record of data for each list element.

Here is sample output when the data frame **Formaldehyde** is passed in.

```
Formaldehyde
```

```
## carb optden
## 1 0.1 0.086
## 2 0.3 0.269
## 3 0.5 0.446
```

```
## 4  0.6  0.538
## 5  0.7  0.626
## 6  0.9  0.782
```

```
c_1 <- conv_df_to_list(Formaldehyde)
str(c_1)
```

```
## List of 6
##  $ R-1:List of 2
##    ..$ carb  : num 0.1
##    ..$ optden: num 0.086
##  $ R-2:List of 2
##    ..$ carb  : num 0.3
##    ..$ optden: num 0.269
##  $ R-3:List of 2
##    ..$ carb  : num 0.5
##    ..$ optden: num 0.446
##  $ R-4:List of 2
##    ..$ carb  : num 0.6
##    ..$ optden: num 0.538
##  $ R-5:List of 2
##    ..$ carb  : num 0.7
##    ..$ optden: num 0.626
##  $ R-6:List of 2
##    ..$ carb  : num 0.9
##    ..$ optden: num 0.782
```

Here we take the first 6 records from **mtcars** and process those

```
mtcars1 <- head(mtcars)
```

```
mtcars1
```

```
##           mpg cyl disp  hp drat   wt  qsec vs am gear carb
## Mazda RX4      21.0   6  160 110 3.90 2.620 16.46  0  1    4    4
## Mazda RX4 Wag  21.0   6  160 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710     22.8   4  108  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive  21.4   6  258 110 3.08 3.215 19.44  1  0    3    1
## Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02  0  0    3    2
## Valiant        18.1   6  225 105 2.76 3.460 20.22  1  0    3    1
```

```
c_2 <- conv_df_to_list(mtcars1)
```

```
str(c_2)
```

```
## List of 6
##  $ R-1:List of 11
##    ..$ mpg : num 21
##    ..$ cyl : num 6
##    ..$ disp: num 160
##    ..$ hp  : num 110
##    ..$ drat: num 3.9
##    ..$ wt  : num 2.62
##    ..$ qsec: num 16.5
##    ..$ vs  : num 0
##    ..$ am  : num 1
##    ..$ gear: num 4
##    ..$ carb: num 4
##  $ R-2:List of 11
##    ..$ mpg : num 21
##    ..$ cyl : num 6
```

```
##    ..$ disp: num 160
##    ..$ hp  : num 110
##    ..$ drat: num 3.9
##    ..$ wt  : num 2.88
##    ..$ qsec: num 17
##    ..$ vs  : num 0
##    ..$ am  : num 1
##    ..$ gear: num 4
##    ..$ carb: num 4
##    $ R-3:List of 11
##    ..$ mpg : num 22.8
##    ..$ cyl : num 4
##    ..$ disp: num 108
##    ..$ hp  : num 93
##    ..$ drat: num 3.85
##    ..$ wt  : num 2.32
##    ..$ qsec: num 18.6
##    ..$ vs  : num 1
##    ..$ am  : num 1
##    ..$ gear: num 4
##    ..$ carb: num 1
##    $ R-4:List of 11
##    ..$ mpg : num 21.4
##    ..$ cyl : num 6
##    ..$ disp: num 258
##    ..$ hp  : num 110
##    ..$ drat: num 3.08
##    ..$ wt  : num 3.21
##    ..$ qsec: num 19.4
##    ..$ vs  : num 1
```

```
##    ..$ am   : num 0
##    ..$ gear: num 3
##    ..$ carb: num 1
##    $ R-5:List of 11
##    ..$ mpg  : num 18.7
##    ..$ cyl  : num 8
##    ..$ disp: num 360
##    ..$ hp   : num 175
##    ..$ drat: num 3.15
##    ..$ wt   : num 3.44
##    ..$ qsec: num 17
##    ..$ vs   : num 0
##    ..$ am   : num 0
##    ..$ gear: num 3
##    ..$ carb: num 2
##    $ R-6:List of 11
##    ..$ mpg  : num 18.1
##    ..$ cyl  : num 6
##    ..$ disp: num 225
##    ..$ hp   : num 105
##    ..$ drat: num 2.76
##    ..$ wt   : num 3.46
##    ..$ qsec: num 20.2
##    ..$ vs   : num 1
##    ..$ am   : num 0
##    ..$ gear: num 3
##    ..$ carb: num 1
```