Stat. 450 Section 1 or 2: Homework 7

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So how should you complete your homework for this class?

* First thing to do is type all of your information about the problems you do in the text part of your R Notebook.
* Second thing to do is type all of your R code into R chunks that can be run.
* If you load the tidyverse in an R Notebook chunk, be sure to include the “message = FALSE” in the {r}, so {r message = FALSE}.
* Last thing is to spell check your R Notebook. Edit > Check Spelling… or hit the F7 key.

Homework 7:

Read: Chapter 9, Chapter 10, Chapter 11  
 Do 10.5 Exercises 1, 2  
 Do 11.2.2 Exercise 2  
 Do 11.3.5 Exercises 6, 7

library(tidyverse)

# 10.5

## 1.

At the Console, all of the variables are printed out. Note the labeling of the rows.

In a notebook data.frames are printed in the same way as a tibble, but the row labels are not printed.

You can use is\_tibble() and class() functions to check what a data.frame is.

library(tidyverse)  
  
is\_tibble(mtcars)

## [1] FALSE

class(mtcars)

## [1] "data.frame"

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

as.tibble(mtcars)

## # A tibble: 32 x 11  
## mpg cyl disp hp drat wt qsec vs am gear carb  
## \* <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>  
## 1 21 6 160 110 3.9 2.62 16.5 0 1 4 4  
## 2 21 6 160 110 3.9 2.88 17.0 0 1 4 4  
## 3 22.8 4 108 93 3.85 2.32 18.6 1 1 4 1  
## 4 21.4 6 258 110 3.08 3.22 19.4 1 0 3 1  
## 5 18.7 8 360 175 3.15 3.44 17.0 0 0 3 2  
## 6 18.1 6 225 105 2.76 3.46 20.2 1 0 3 1  
## 7 14.3 8 360 245 3.21 3.57 15.8 0 0 3 4  
## 8 24.4 4 147. 62 3.69 3.19 20 1 0 4 2  
## 9 22.8 4 141. 95 3.92 3.15 22.9 1 0 4 2  
## 10 19.2 6 168. 123 3.92 3.44 18.3 1 0 4 4  
## # ... with 22 more rows

library(nycflights13)  
  
is\_tibble(flights)

## [1] TRUE

is\_tibble(planes)

## [1] TRUE

is\_tibble(airports)

## [1] TRUE

is\_tibble(weather)

## [1] TRUE

class(flights)

## [1] "tbl\_df" "tbl" "data.frame"

## 2.

The main thing that is different is that with data.frame the reference to the variable can use only the first letter, the rest are assumed. This could lead to problems because more than one variable name may start with the same letter.

The tibble returns a tibble all of the time, regardless of selecting one column or more than one column. In a data.frame if a single column is selected, a vector is returned, otherwise a data.frame is retured. This behavior could cause problems.

df <- data.frame(abc = 1, xyz = "a")  
df$x

## [1] a  
## Levels: a

df[, "xyz"]

## [1] a  
## Levels: a

df[, c("abc", "xyz")]

## abc xyz  
## 1 1 a

Converting the data.frame to a tibble.

df <- tibble(abc = 1, xyz = "a")  
df$x

## Warning: Unknown or uninitialised column: 'x'.

## NULL

df[, "xyz"]

## # A tibble: 1 x 1  
## xyz   
## <chr>  
## 1 a

df[, c("abc", "xyz")]

## # A tibble: 1 x 2  
## abc xyz   
## <dbl> <chr>  
## 1 1 a

# 11.2.2

## 2.

Read the help files, it appears they have all of the same options.

* col\_names = TRUE
* col\_types = NULL
* locale = default\_locale()
* na = c(“”, “NA”)
* quoted\_na = TRUE
* quote = “"”
* trim\_ws = TRUE
* n\_max = Inf
* guess\_max = min(1000, n\_max)
* progress = show\_progress()

?read\_csv  
?read\_tsv  
  
union(names(formals(read\_csv)), names(formals(read\_tsv)))

## [1] "file" "col\_names" "col\_types" "locale" "na"   
## [6] "quoted\_na" "quote" "comment" "trim\_ws" "skip"   
## [11] "n\_max" "guess\_max" "progress"

intersect(names(formals(read\_csv)), names(formals(read\_tsv)))

## [1] "file" "col\_names" "col\_types" "locale" "na"   
## [6] "quoted\_na" "quote" "comment" "trim\_ws" "skip"   
## [11] "n\_max" "guess\_max" "progress"

# 11.3.5

## 6.

These solutions are from the [R for Data Science Solutions](https://jrnold.github.io/r4ds-exercise-solutions/data-import.html#exercise-11.3.5.6). Note the problem number has changed.

UTF-8 is standard now, and ASCII has been around forever.

For Asian languages Arabic and Vietnamese have ISO and Windows standards. The other major Asian scripts have their own:

* Japanese: JIS X 0208, Shift JIS, ISO-2022-JP
* Chinese: GB 2312, GBK, GB 18030
* Korean: KS X 1001, EUC-KR, ISO-2022-KR

## 7.

Generate the correct format strings.

d1 <- "January 1, 2010"  
d2 <- "2015-Mar-07"  
d3 <- "06-Jun-2017"  
d4 <- c("August 19 (2015)", "July 1 (2015)")  
d5 <- "12/30/14" # Dec 30, 2014  
t1 <- "1705"  
t2 <- "11:15:10.12 PM"

parse\_date(d1, "%B %d, %Y")

## [1] "2010-01-01"

parse\_date(d2, "%Y-%b-%d")

## [1] "2015-03-07"

parse\_date(d3, "%d-%b-%Y")

## [1] "2017-06-06"

parse\_date(d4, "%B %d (%Y)")

## [1] "2015-08-19" "2015-07-01"

parse\_date(d5, "%m/%d/%y")

## [1] "2014-12-30"

parse\_time(t1, "%H%M")

## 17:05:00

parse\_time(t2, "%H:%M:%OS %p")

## 23:15:10.12