Stat 5050: Introduction to R, Homework 01 (20 Points)

Peter Kurtz

General Instructions

For this first homework assignment, each student **must** create a R Markdown (.Rmd) file and knit that file into a pdf file. Only that resulting pdf file has to be submitted via Canvas. Starting with Homework 02, I encourage potential and current MS and PhD students to work with Rnw and LaTeX instead, but everyone at least once has to work with R Markdown!

For this HW, download the Rmd file and edit it. Fill in your answers as text and place your R code in the predefined code chunks.

Feel free to use this Rmd file as a template for future HW submissions if you plan to create those using R Markdown.

Do not forget to add your name!

Questions

Question (i) (4 Points)

Tell me a little more about you:

1. What is your name? My name is Peter Kurtz.
2. What is your major? (State all if you have more than one). My major is mathematics and statistics composite major.
3. Are you a Freshman, Sophomore, Junior, Senior, MS student, or PhD student? I am a Senior.
4. What do you consider your current level of R competence? Don't be too modest.
    - none
    - very little competence
    - basic competence
    - advanced competence
    - guru

I would consider myself to have basic competence.

Note: To create this list, I had to look at this help page: https://stackoverflow.com/questions/45541361/creating-lists-and-sub-items-in-r-markdown-not-working-any-longer. Note that there are no spaces but Tab symbols after the digit and double Tab symbols before the + to create this nested list.

In fact, when working with R, R Markdown, Rnw, LaTeX, bibtex, and more, we will frequently have to look up information from the web. Learning to find online information efficiently will be a major goal for this course and future follow-up courses.

Question (ii) (2 Points)

What do you hope to gain from this course? You could answer this in terms of the previous question, i.e., what level of R competence do you **wish to achieve** in the long term (and not only after these 5 weeks)? Answer in 2 or 3 sentences, e.g., with respect to a future job you might be interested in (and how to use R in that job).

I hope to gain advanced competence in R. I am interested in becoming a statistical programmer or data scientist so knowing R would be very beneficial. I think I could achieve this in a year.

Question (iii) (4 Points)

Which follow-up courses that make use of R do you plan to attend after this course? List at least 2 such courses. Be as specific as possible and list the course numbers, titles, instructor names, course web pages (if available), and any other information you can find for these courses. Include URLs, i.e., links to web pages, whenever possible.

Statistical Visualization I is a class I would like to take. The course number is STAT 5550. The class seems to be taught be multiple professors. URL: https://catalog.usu.edu/search_advanced.php?cur_cat_oid=35&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=33&filter%5Bkeyword%5D=STAT+5550

Another class I would like to take is Data Technologies. The course number is STAT 5080. This class also seems to be taught by multiple professors. I could only find this class on college scheduler under my account and Coursicle. URL: https://www.coursicle.com/usu/courses/STAT/5080/

Question (iv) (10 Points)

Revisit the Example1.Rmd example (from the L02_Examples zip file) that is related to temperatures. Copy all relevant code chunks into this file to answer the following question parts.

Load the SFTemps.rda data file

```
load("SFTemps.rda")
```

Temperature conversion function from Fahrenheit to Celsius

```
tempC <- function(temp) {
  celsius <- ((temp - 32) * (5 / 9))
  return(celsius)
}
```

Part (a) (2 Points)

What was the median temperature? Adjust the calculation for the mean, but use median instead. **Show the R code and the result!**

```
median(temp, na.rm = TRUE)
```

```
## [1] 57
```

Part (b) (2 Points)

What was the maximum temperature? Adjust the calculation for the minimum, but use max instead. **Show only the result (but not the R code)!**

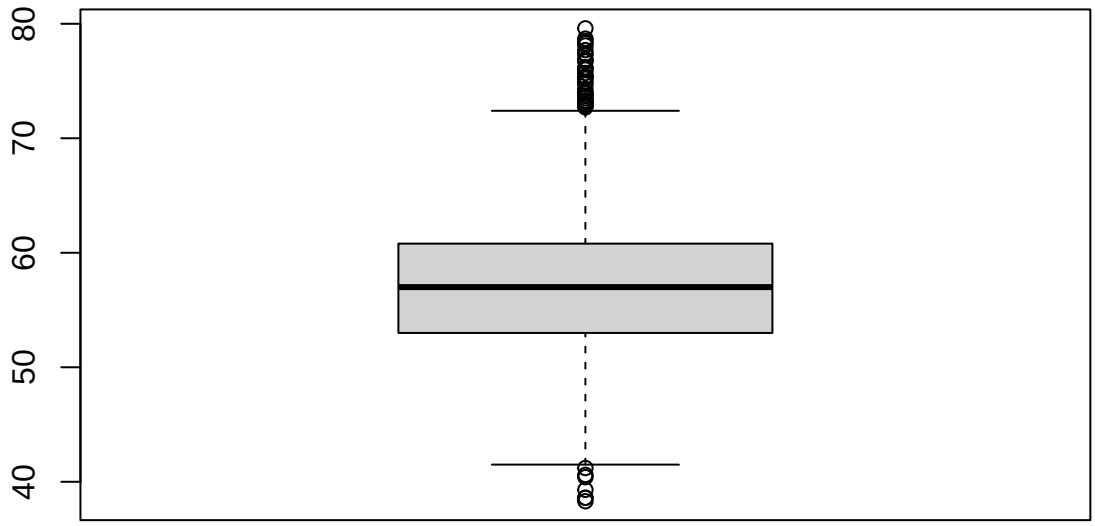
```
## [1] 79.6
```

Part (c) (2 Points)

Complete the following sentence: The temp data set contains 5534 observations. **Use inline R code and do not manually copy the number into the xxx position.** Revisit https://bookdown.org/yihui/rmarkdown-cookbook/r-code.html if you don't recall how to use inline R code.

Part (d) (2 Points)

Graphics are not part of this course, but we should be able to incorporate them into our R Markdown (or Rnw) documents. So, create a basic boxplot of the temp data set. Follow the histogram example. **Only show the resulting boxplot (but not the R code)!**



Part (e) (2 Points)

What are -40, 32, and 50 degrees Fahrenheit in degrees Celsius? Use the tempC function 3 times to obtain the Celsius degrees. You can call a user-defined function (such as tempC) in a similar way as to calling the min, max, mean, median, summary, etc. functions. **It is always a good idea to verify and check your results. So, if you are in doubt whether these results are correct, use your phone or an online temperature conversion calculator and do the same calculations! Show the R code and the results!**

```
tempC(-40)
```

```
## [1] -40
```

```
tempC(32)
```

```
## [1] 0
```

```
tempC(50)
```

```
## [1] 10
```

You are done with Homework 01 !!!