A06 - Crafting Reports

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Table 1: Table 1: EPA Air Quality

Item Name	Value
Filename	EPAair_O3_PM25_NC1819_Processed.csv
Date	2018-2019
Source	EPA Air Quality System (AQS)

0.1 Objectives:

1. More practice with R code chunk options
2. Gain proficiency with figures, tables (w/`Kable`) table of contents, etc.
3. Debugging knitting issues

0.2 Directions

1. Rename this file `<FirstLast>_A06_CraftingReports.Rmd` (replacing `<FirstLast>` with your first and last name).
2. Change "Student Name" on line 3 (above) with your name.
3. Work through the tasks, **creating code and output** that fulfill each instruction.
4. Be sure your code is tidy; use line breaks to ensure your code fits in the knitted output.
5. Be sure to **answer the questions** in this assignment document.
6. When you have completed the assignment, **Knit** the text and code into a single PDF file.
7. **Be sure that you also commit and push your final Rmd document to your GitHub account**.

0.3 Task 1 - Basic Markdown

Using markdown, create a 2-column table beneath the `Table: EPA Air Quality` line below that summarizes the metadata of the EPA Air Quality data.

- The first column should have the header `Item`, below which are three rows listing these metadata attribute item names: `Filename`, `Date`, and `Source`.
- The second column should have the header `Value` and include the metadata values: `EPAair_O3_PM25_NC1819_Processed`, `2018-2019`, and `EPA Air Quality System (AQS)`.
- The first column should be aligned to the right and the second to the left.

Table: EPA Air Quality

0.4 Task 2 - Import packages and data, suppressing messages

Set the following R code chunk so that it runs when knit, but no messages, errors, or any output is shown. The code itself, however, should be displayed.

```
#Import libraries
install.packages("kableExtra")
install.packages("tidyverse")
install.packages("lubridate")
install.packages("here")
install.packages("knitr")
```

```r
library(tidyverse)
library(lubridate)
library(here)
library(knitr)
library(kableExtra)

#Import EPA data (from the processed_KEY folder) & fix dates
epa_data <- read.csv(
  here("Data","Processed_KEY","EPAair_O3_PM25_NC1819_Processed.csv"),
  stringsAsFactors = TRUE) %>%
  mutate(Date = ymd(Date))


#the code at the top is set so that the code
#output will show
#the messages generated by the code won't show
#the warning messages won't show
#the errors won't show on the knit
```

0.5 Task 3: Creating tables

Set the following R code chunk to display two tables, using knitr's `kable()` function, one listing the mean PM2.5 concentrations for each county, and the other the same except for Ozone.

- The titles should be "Mean Particulates (2.5mm)" and "Mean Ozone", respectively.
- The column names should be "County" and "µg/m3" for both tables. (See tip below.)
- Finally, round the concentration values in the 2nd column to two decimal places.

Customize the chunk options such that the code is run but is not displayed in the knitted document. The output, however, should be displayed.

TIPS:

- Use `"$\\mu g/m^3$"` as a column name to generate a nicely formatted string via markdown/MathJax notation
- If your output table spans across two pages, try inserting a page break in the markdown just before your code chunk.

Table 2: Table 2: Mean Particulates (2.5mm)

County	$\mu g/m^3$
Haywood	13.98
New Hanover	15.61
Avery	18.28
Edgecombe	26.07
Pitt	27.37
Guilford	29.14
Swain	30.63

County	$\mu g/m^3$
Johnston	33.03
Durham	33.54
Mecklenburg	33.63
Forsyth	35.09
Wake	37.45

Table 3: Table 3: Mean Ozone

County	$\mu g/m^3$
Swain	35.58
Avery	38.39
Wake	38.61
New Hanover	39.12
Edgecombe	39.22
Johnston	40.34
Mecklenburg	40.46
Durham	40.70
Pitt	41.64
Forsyth	44.02
Haywood	44.75
Guilford	45.87

0.6 Task 4: Plots

Below this paragraph, but above the horizonal line (`---`), create two separate code chunks that create boxplots of the distribution of Ozone levels by month using, one for only records collected in 2018 and one for records in 2019. Customize the chunk options such that the final figures are displayed but not the code used to generate the figures. In addition, align the plots on the left side of the page and set the figure heights so both plots fit on the same page with minimal space remaining. Lastly, add a `fig.cap` chunk option to add a caption (title) to your plot that will display underneath the figure.

##Distribution of Ozone Levels by month 2018

```
## Warning: Removed 1199 rows containing non-finite outside the scale range
## (‘stat_boxplot()‘).
```

##Distribution of Ozone Levels by month 2019

```
## Warning: Removed 947 rows containing non-finite outside the scale range
## (‘stat_boxplot()‘).
```

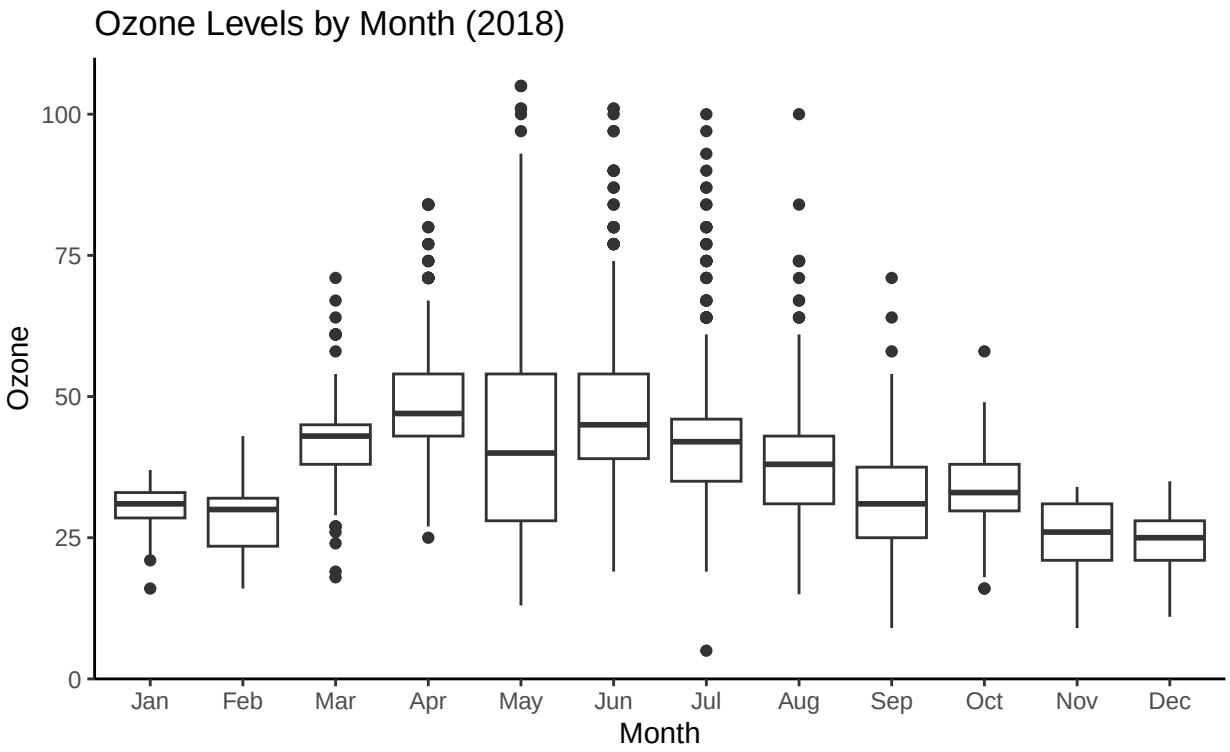

Figure 1: 2018 monthly Ozone Levels

0.7 Task 5: Knit and submit.

Add a table of contents and list of figures to your document and knit to a PDF. Submit your PDF to Sakai, but also be sure to commit and push your Rmd file used to create this knit document to GitHub. In the section below, add a link to your GitHub repository.

0.8 Git Repository

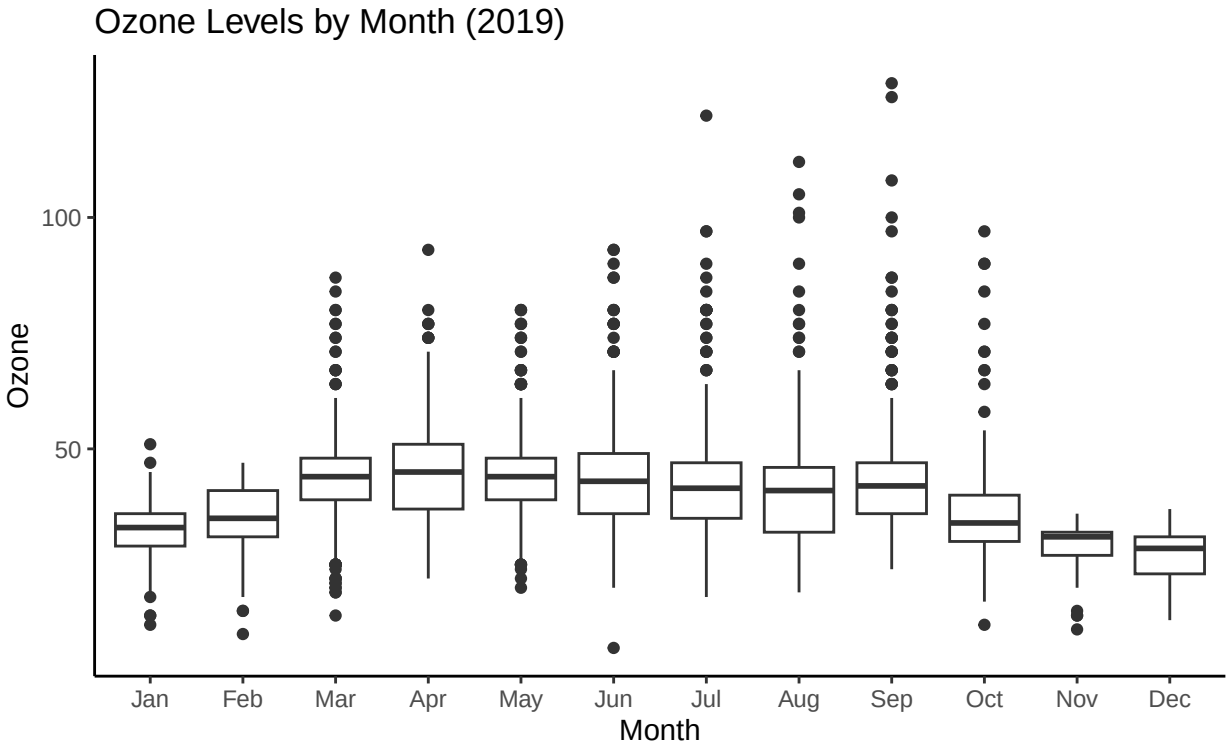

Figure 2: 2019 Monthly Ozone Levels