*\*Please save this file as “LAST NAME\_Assignment 3.docx”*

***Open-Ended Responses***

1. **III.1** This is a graph from the USA Today back in 2012; I would argue that it is misleading because of the y-axis. According to the principles of data (Tufte), how might the y-axis distort the data?

Chart, bar chart

Description automatically generated

|  |
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| The Y axis only ranged from 94,000,000 to 108,000,000. If this were to range from 0 to 108,000,000 the trend would be very insignificant. |

1. **III.1** Let’s say I’m trying to convince someone that we should be very concerned about rising temperatures due to climate change so I show the average temperatures in Connecticut. I would argue that the below graph is misleading because of the x-axis. According to the principles of data (Tufte), how might the x-axis distort any claims I’m making about global climate change?

Chart, line chart

Description automatically generated

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| Just like the previous question, the axis is not large enough. Not only does this not show the entire range of climate data, but also does not even show one whole year of temperature data. Clearly the temperature will be hotter in the summer versus the winter. |

1. **III.5** For each plot, label the **aesthetics** & **geom(s)** that are present. The first two rows are filled out as examples of what I’m looking for. I have mapped the variable to the aesthetics for clarity, but you do not need to do that. Note: Color vs Fill can be had to tell and depends on the geometry; I’ll be lenient with these.

|  |  |  |
| --- | --- | --- |
| Plot | Aesthetics: | Geom(s) |
| 3.3 A ggplot2 Tangent | R for Statistics in EPH | **x** (gestational age)  **y** (birthweight)  **color** (hypertensive / not hypertensive)  **size** (maternal age)  **shape** (sex) | **geom\_point()**  **geom\_smooth()** |
| Visualizing data with R/ggplot2 - One more time - the Node | **x** (time)  **y** (average value)  **color** (id: Cdc42, Rac, Rho) | **geom\_line()**  **geom\_smooth()** |
| ggplot2 extensions | x (mpg highway)  y (car class)  color () | **Geom\_boxplot+**  **Coord\_flip** |
| How to Make Boxplot in R with ggplot2? - Python and R Tips | x (continent)  y (life expectancy)  color (default)  by continent | **Geom\_boxplot**  **Geom\_point** |
|  | **x (weight)**  **y (count/number pf each sex)**  **color(default) by sex** | **Geom\_histogram** |
|  | **X (dose/amount)**  **Y (length?)**  **Color (default r) by supp** | **Geom\_bar + position= dodge** |

1. **III.6** Name an example in your own discipline where you would ever find the utility of using facet\_wrap() or facet\_grid() to produce multiple plots that are very similar, but change something each time.

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| --- |
| I could see myself using facet wraps to compare different sorption rates of PFAS types or by biochar types. |

1. **III.8** What is the primary advantage to exporting your plot with ggsave() or png(), jpg(), pdf(), etc. versus just copying/pasting or grabbing a screen shot from the previewer pane in RStudio?

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| It allows you to save the plot at much higher resolutions and change the size and pixel count and also change it between vector/raster data |

***Coding Section***

To complete this section, start a new script file with the following layout:

# YOUR NAME

# Assignment 3 Data Visualizations

# #1 ---------------- (new section: CTRL + SHIFT + R)

here’s my code # with adequate commenting

# #2 ---------------- (new section: CTRL + SHIFT + R)

here’s my code # with adequate commenting

Using the copus data, make the following plots to the best of your ability (may not be exactly the same if using jittering, default colors, text, titles, exact theme, etc, but should tell the same story). Note: you might have to manipulate the data before you can make the plot. You just need to supply the code for this, no need to actually grab/submit a screen shot or save the plot.

1. ggplot(copus, aes(y=Lec)) + geom\_boxplot()

Chart

Description automatically generated

1. copus <- copus %>%

filter(!is.na(Size))

ggplot(copus, aes( x = Size)) + geom\_bar()

Chart, bar chart

Description automatically generated

1. copus <- copus %>%

filter(!is.na(Size)) %>%

ggplot(copus, aes(x=Broader))+

geom\_bar()+

facet\_wrap(~Size)Chart

Description automatically generated

1. copus <- copus %>%

ungroup()

copus <- copus %>%

group\_by(Broader) %>%

summarise(Avelec = mean(Lec))

ggplot(copus, aes(x = Broader, y = Avelec)) + geom\_point()

Chart

Description automatically generated

1. The red dots are the average for each discipline (you made this graph above).

ggplot(copus2, aes(x = Broader, y = Lec)) + geom\_boxplot() + geom\_point(aes(x = Broader, y = Avelec, colour ="red")Chart, box and whisker chart

Description automatically generated

# 6 -----------------------------------------------------------------------

copus <- copus %>%

group\_by(Broader) %>%

select(Broader, Size, CG, WG, OG)

sapply(copus, class) #wont pivot because its not a character so I changed them

copus[3] <- sapply(copus[3],as.character)

copus[4] <- sapply(copus[4],as.character)

copus[5] <- sapply(copus[5],as.character)

copus <- copus %>%

pivot\_longer( cols = CG:OG, names\_to = "Group Work") %>%

group\_by(`Group Work`)

copus<- copus %>%

group\_by(Broader)

sapply(copus, class) #change these to numbers so I can graph them

copus[4] <- sapply(copus[4], as.numeric)

ggplot(copus, aes( x = `Group Work`, y = value, fill = Broader)) + geom\_boxplot()+ geom\_point()+ facet\_wrap(~Size)

Calendar

Description automatically generated

1. For the final plot:
   1. Take your code from the previous plot.
   2. Clean up the plot by:
      1. Removing all the outlier points (all the individual points outside of the main boxplot; see ??geom\_boxplot() and all of the arguments that start with “outlier.”)
      2. Change the y-axis limits for a maximum of 60.
      3. After changes, it should look like this:

Chart

Description automatically generated

* 1. Write code that will export it as a .pdf that is 2 inches tall, 6 inches wide.

ggplot(copus, aes( x = `Group Work`, y = value, fill = Broader)) +

geom\_boxplot(outlier.shape = NA)+

ylim(0,60) +

facet\_wrap(~Size)

ggsave("Data\_Vis.pdf",

height = 2,

width = 6,

units = "in",

dpi = 72)