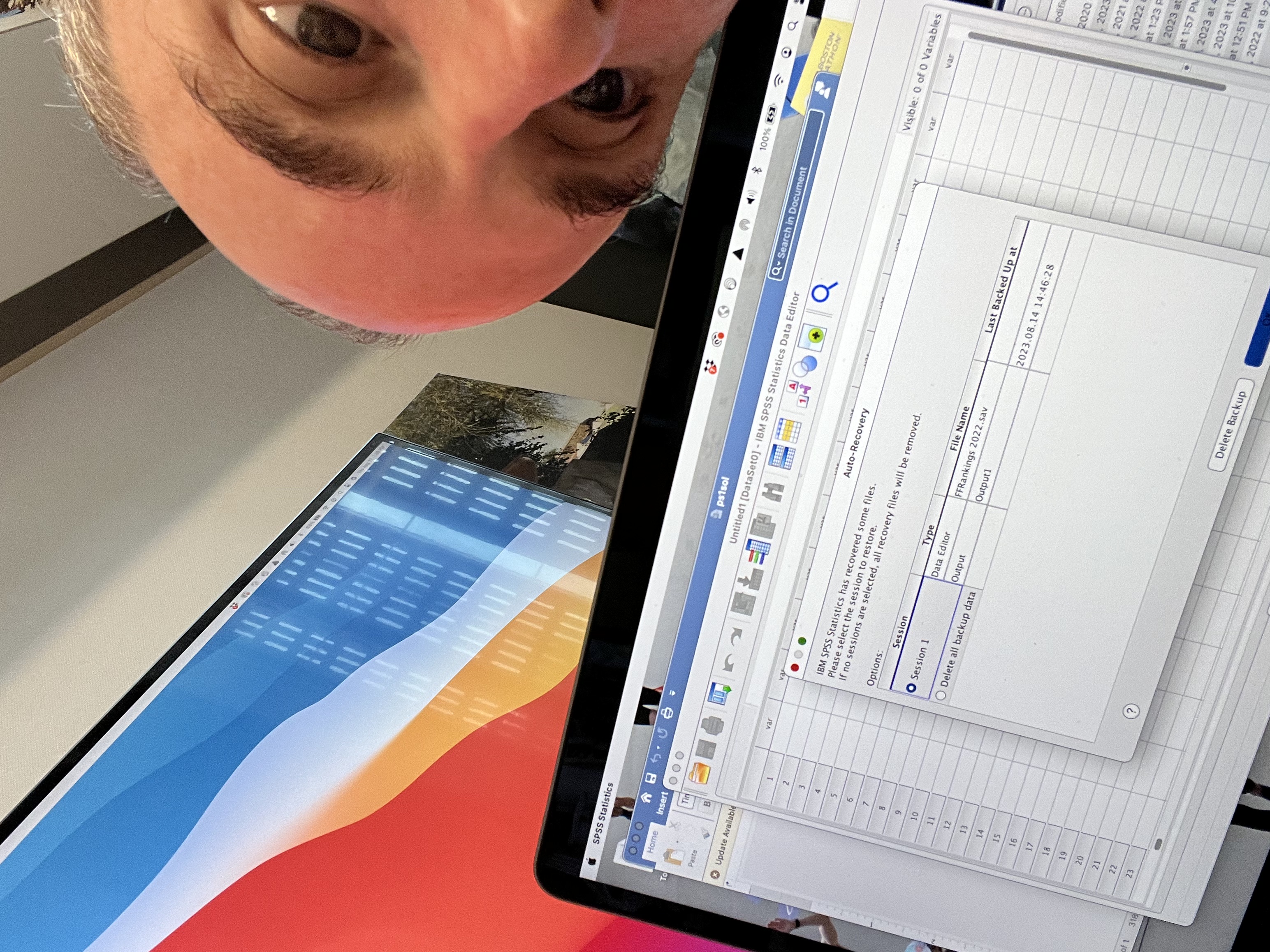
Homework 1: Key terms and Frequency Distributions

1. Take a selfie with your laptop showing that you have successfully downloaded SPSS in the background of the photo. Post the selfie here.



1. A recently conducted study showed that Connecticut drivers change lanes on the highway without using their signal 1.46 times per mile. What kind of statistic is cited in the previous sentence? That is a **descriptive** statistic. It tells us something about Connecticut drivers, but doesn’t allow us to draw any inferences or to compare CT drivers with drivers from other states.
2. That same study determined that Connecticut drivers are much more likely to change lanes without signaling when compared to the national average. Does that conclusion rest on an inferential or a descriptive statistic? The inference that Connecticut drivers would rest on an **inferential** statistic. Inferential statistics allow us to draw comparisons between one sample/population and other sample/populations.
3. I recently read a study designed to determine if exercise reduced depression in college students. A group of students was selected randomly from the campus directory. They rated their mood on a 10-point scale and indicated how many hours a week they went to the gym. The researchers found that, in general, people who spent more time in the gym reported being in better moods than people who spent less time in the gym. For the described study:
   1. Please identify the independent and dependent variables along with the operational definition for each.    
      The **independent variable** in the study was exercise, which was operationally defined as the number of hours one spent in the gym per week. The **dependent variable** was depression, which was operationally defined as self-reported ratings on a 10-point scale.
   2. What type of scale of measurement are the IV and DV in?  
      The **IV is a ratio scale** because the interval is the same across the scale (one hour) and there’s a true zero point that corresponds to the absence of the variable (0 = no exercise). The **DV is an ordinal scale**: the values are ordered but we can’t be sure that the difference between a 1 and a 2 is the same as the difference between a 5 and a 6.
   3. Was the study correlational or experimental?   
      The experiment was **correlational/observational** in that the researchers merely measured on-going behavior.
   4. Can the researchers draw a cause-and-effect relationship between the variables of interest? If not, propose an alternative explanation for the reported results.
   5. **No.** They did not attempt to control either exercise or depression, nor were the subjects randomly assigned to conditions (exercise vs. no exercise). Therefore, the researchers cannot make cause-and-effect conclusions regarding their data because other explanations are possible. For example, depressed people may have less energy, which makes it less likely that they will go to the gym. Or, it could be that people who are disposed towards regular exercise are less disposed to depression.
4. Make a frequency distribution table for the following data that includes the frequency and the relative frequency for scores:

74 103 95 98 81 117 105 99 63 86 94 107 96 100 98 118 107 82 84 71 91 107 84 77

|  |  |  |
| --- | --- | --- |
| Class | Frequency | Relative Frequency |
| 60-69 | 1 | .04 |
| 70-79 | 3 | .13 |
| 80-89 | 5 | .21 |
| 90-99 | 7 | .29 |
| 100-109 | 6 | .25 |
| 110-119 | 2 | .08 |

1. Answer the questions below on the basis of this figure:
   1. Is this figure a bar graph or a histogram? Explain your answer.

Given that the bars are touching and that the variable on the x-axis appears to be continuous, this must be a histogram.

* 1. How many modes does the figure include?

There is a single mode at 88.

* 1. Is the figure positively-skewed, negatively-skewed or symmetrical?

The data appear to be negatively skewed as the tail appears in the lower end of the distribution.