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Data Analysis Student Learning Outcome Reflection

The artifact I selected to represent the Data Analysis learning outcome and reflection is my paper, "Climate-Growth Relationships in White Oak (*Quercus alba L.*) from Tree-Ring Data." I selected this artifact for Data Analysis because it was a very data-reliant paper and required the use of various statistical and computer analysis programs including R Programming and COFECHA, a tree-ring cross-dating software developed by Henri Grissino-Mayer in 2001.

The learning outcome for Data Analysis is such that students should have the ability to analyze primary sources of data to effectively test hypotheses, and this artifacts demonstrates completion in multiple ways. For example, I had to use the International Tree-Ring Data Bank to determine which tree species, location, and pieces of data I would need to gather, as well as how to manipulate that data into a format that could be analyzed easily by COFECHA and R. I used two different statistical analysis computer programs: COFECHA to verify the accuracy of cross-dating and the tree-ring series, and R to detrend and compile raw ring-width series into a chronology and then to perform a response function analysis with temperature and precipitation data. For each software I generated a table and/or a figure to represent the results of the data analysis. In this data analysis project, I was able to effectively generate a testable hypothesis, find and analyze the data needed for that hypothesis, represent the results, and interpret them in relation to my prediction(s).

One thing I learned while creating this artifact is that certain skills cannot be obtained in only a matter of days or weeks, such as using and understanding R Programming for data analysis. On the other hand, I learned that it is always okay to ask for guidance from others who have more experience so that I can sufficiently understand what I am working on and be able to figure it out on my own more effectively and efficiently. Some strengths of this artifact include

that clarity of my explanations of the methods, the background leading to my hypothesis, and my results section. Another strength would be the amount of detail and analysis in my discussion, but one weakness may be suggestions for future studies in the discussion. I liked that my introduction and hypothesis were clear and concise, and I expressly stated what I would be looking at throughout the paper, what my prediction was, and the importance. On the other hand, I dislike the transitions between some of my sentences as it is written in a more short and concise manner than in a clear but flowy style of writing that is sometimes used. I think that if I were to recreate this artifact from the beginning, I would alter my writing style such that it is still clear, concise, and well-explained, but in a way that represents a more developed writing style and a way that flows more easily from sentence-to-sentence.