**SCI 105 Week 8 Lab: Analyzing Project Budburst Data** 

**Purpose:** to learn how to analyze and interpret field research data and use that information to make conclusions and predictions. You will be identifying trends, relationships, variations, outliers, and patterns in the data. Data analysis is an important part of the scientific process. It is also used in everyday life. It is the practice of working with data to glean useful information, which can then be used to make informed decisions. This data can be used to visualize situations and gain a better understanding of how things work -- it paints us a vivid picture of the world! Your data tells you stories and a good researcher always listens carefully to what their data says! You will be visiting the Budburst Project Website and looking at their available data. You will come up with a research question, filter the data online, analyze it, and try to answer your question -- following the scientific method. You will then write your lab reflection.

**READ THE FOLLOWING CAREFULLY!!!**

| **Lab Instructions:**  **[1] First, go check out the Budburst Project Data Site! You will need to narrow down and filter the data.**   * <https://budburst.org/data> * Filter the data by selecting a time range (go back at least 3 years, if not more) -- how many observations? * Next, filter the data by selecting IL state as a region -- phenology as an observation type -- and a plant group * There will still be a lot of data to work with, so narrow the pool more by selecting 1-2 species to focus on   **[2] Make your observations on the data --- what story does it tell? When you click on an observation…..**   * See when the data was collected and what stage was the plant in? TAKE NOTES!!!!! * Look at your ENTIRE data pool as much as possible (click on each one and peruse the information) * TAKE NOTES!!!!! What patterns are emerging? Are they flowering, budding, releasing seeds at particular times, months, seasons? Are these events changing over time at all? Notice the earlier vs. later dates.   **[3] Formulate a good research question (that can easily be answered by this data) --**   * If you see a clear seasonality to the budding/flowering/seeding/cone event -- is it temperature related? You can go to weather underground and look up temperature data for those times and see if there is a correlation or change over time: <https://www.wunderground.com/history>   + Maybe you see a pattern with areas -- closer to the city v. further away from the city   + Maybe you see a pattern with areas more or less populated with houses and people * Ask a good research question based on the relationship of ONE external factor impacting the budding/flowering/seeding/cone event of your chosen plant (like temp, season, geographic location, proximity to city, etc.). Here are good resources on how to formulate strong research questions:   + <https://twp.duke.edu/sites/twp.duke.edu/files/file-attachments/research-questions.original.pdf>   + <https://www.ecologyproject.org/post/how-to-write-a-science-research-question>   **[4] Create a graph of your chosen filtered data**   * Figure out which variables you need to look at in order to answer your research question (ex. Budding time and temperature) and create AT LEAST one graph * Include your graph (or a pic of it) in the assignment dropbox or add it to your reflection * Visit the following website to review tips on how to graph data:   + <https://openoregon.pressbooks.pub/mhccmajorsbio/chapter/presenting-data/>   **[5] Make your conclusions -- what story does your graph tell?**   * You won’t be analyzing the data, statistically -- just eyeballing your graph and describing it * What are the patterns, trends, interesting aspects of your graph? * Are there inconsistencies or outliers?   **[6] Write your final lab reflection and upload it in your assignment dropbox, addressing the following lab questions:**   * **What data did you choose and why? (ex. What species, region, etc.)** * **How many observations made up your filtered data pool?** * **What did you initially observe when you saw the data?** * **What was your research question?** * **Why did you choose those variables?** * **What did your graph tell you?** * **What could you conclude from all your data and graph(s)? Did you answer your question?** * **What are other interesting things you noted about the data?** |
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