

6. Worksheet: Diversity Sampling and Data Wrangling

Student Name; Z620: Quantitative Biodiversity, Indiana University

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OVERVIEW

In this worksheet, you will use the jelly bean site-by-species matrix generated from **7. Diversity Sampling and Data Wrangling**. Along with tools outlined in the **5. Local (alpha) Diversity**, **6. Among site (beta) diversity**, and **7. Diversity Sampling and Data Wrangling** handouts, you will develop questions, visualize data, and test hypotheses related to sampling effects and its effect on estimates of within- and between-sample biodiversity.

Directions:

1. In the Markdown version of this document in your cloned repo, change “Student Name” on line 3 (above) to your name.
2. Complete as much of the worksheet as possible during class.
3. Refer to previous handout to help with developing of questions and writing of code.
4. Answer questions in the worksheet. Space for your answer is provided in this document and indicated by the “>” character. If you need a second paragraph be sure to start the first line with “>”. You should notice that the answer is highlighted in green by RStudio (color may vary if you changed the editor theme).
5. Before you leave the classroom, **push** this file to your GitHub repo.
6. For the assignment portion of the worksheet, follow the directions at the bottom of this file.
7. When you are done, **Knit** the text and code into a PDF file.
8. After Knitting, submit the completed exercise by creating a **pull request** via GitHub. Your pull request should include this file `6.DiversitySampling_Worskheet.Rmd` and the PDF output of Knitr (`DiversitySampling_Worskheet.pdf`).

1) Group brainstorming

With your team partner and perhaps other students in the class, spend 15 minutes or so brainstorming questions, code, “fantasy figures”, and statistical tests that could be used to test questions with the class’s data represented in the site-by-species matrix and rarefaction curve data that you have generated.

2) Sampling coverage and rarefaction curves

Question 1: How do changes in community composition impact our ability to make inferences on the communities we sampled?

Use the space below to generate a rarefaction curve based on the data we collected in class for each community. Make sure to annotate your code using # symbols so others (including instructors) understand what you have done and why you have done it.

Answer 1:

3) Alpha diversity

Question 2: Which alpha diversity measures can you use on your site-by-species matrix? (a) Please provide at least two different measures. (b) Generate a hypothesis around the two metrics you chose and test your hypothesis. (c) Interpret your findings.

Answer 2a:

Answer 2b: Use the space below for code that is being used to analyze your data and test your hypotheses on your two chosen alpha diversity metrics. With your analysis, create one (and only one, although it can have multiple panels) *publication quality* figure. Make sure to annotate your code using # symbols so others (including instructors) understand what you have done and why you have done it.

Answer 2c: Write an informative yet succinct (~5 sentences) caption that creates a “stand-alone” figure. Take a peek at figures and figure captions in a paper published in your favorite journal for inspiration.

4) Beta diversity

Question 3: Which beta diversity analyses can you use on your site-by-species matrix? (a) Please provide at least two different analyses (b) Generate a hypothesis around your chosen analyses and test your hypothesis. (c) Interpret your findings.

Answer 3a:

Answer 3b: Use the space below for code that is being used to analyze your data and test your hypotheses on your two chosen beta diversity analyses. With your analysis, create one (and only one, although it can have multiple panels) *publication quality* figure. Make sure to annotate your code using # symbols so others (including instructors) understand what you have done and why you have done it.

Answer 2c: Write an informative yet succinct (~5 sentences) caption that creates a “stand-alone” figure. Take a peek at figures and figure captions in a paper published in your favorite journal for inspiration.

SUBMITTING YOUR ASSIGNMENT

Use Knitr to create a PDF of your completed 6.DiversitySampling_Worksheet.Rmd document, push it to GitHub, and create a pull request. Please make sure your updated repo includes both the pdf and RMarkdown files.

Unless otherwise noted, this assignment is due on **Wednesday, April 7th, 2021 at 12:00 PM (noon)**.