Notes for Preparing Report Drafts

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Thank you, all, for the great Week 4 project reports! I have finished reviewing everyone's work and you should now have access to scores as well as comments unique to your project. As you continue working on your projects and writing up the report drafts due by the end of the day Sunday, there are some key issues I've seen come up in your work and I wanted to make sure everyone can benefit from the notes you may see individually in your documents.

Sometimes it can be challenging to know where in the document information should be placed -- you know that certain text needs to be there somewhere, but does it really fit in the Methods section, or should it be written into the chapter about your Results? Don't worry, you're not the only one that may need some help with this. The most important part is that you make sure the information does get written into the document...and then, if need be, I can make notes within your draft to help with improving the organization later. Please do your best, though, to use the following reminder as you work on the full length composition:

Introduction: Depending on how you organize your information into chapters, you may have only one big chapter to set the context for your project, or you may elect to have a brief introductory chapter followed by additional (at least two) chapters focused on specific background information. There are merits to either organizational approach; however, the important part is that your paper starts off by providing two key aspects:

Make sure that the reader has a firm understanding of what is already known about this subject (this is a review of the pertinent literature).

Very clearly state the purpose of the study and your research objective(s). Remember, your work should build upon what is already known, but it must demonstrate a unique contribution. It is important that there is no ambiguity about how you are improving upon or making an extension of previous work. Once this is established, give a brief overview of the strategy you will use in order complete your work (this is a cursory summary of what will be developed in detail in the procedural chapter that follows).

Methods: Make sure to explain the procedures used in order to accomplish your outcomes. In part, this is a place to acknowledge work from others that you are integrating (such as clearly stating the original source of the data you used, or the analysis platform/algorithms applied). You also should make clear your unique contributions. Everyone has settled on a project that is taking pre-existing data to generate novel data sets. These new compilations or arrangements of data should be sharable. Please arrange to have an electronic method to share this information (such as through a cloud platform) and have this information made available through an appendix, referenced as available there within the Method section.

Results: Within Results chapter(s), information needs to be presented two ways. Visual representations (data panels, either as tables or figures) must be included. Please see the Format Guide for expectations related to placing these panels in the text. The data panels must also be fully described with accompanying text.

Discussion/Conclusion: What you call this chapter is a bit of a "to-MAE-to" versus "to-MAH-to" situation -- either heading works. The more important part is the content. You will need to summarize the outcome of your work, and ultimately, it is really important to make clear the biological relevance of your study. Sure, you can take some information, dump it into an algorithm, get some numbers back, but what do they mean? A big objective of this program is to make sure that you can apply your data science skills to specific domain knowledge -- can you demonstrate that you are able to bridge both the biology and data parts of the bigger question? This section needs to integrate your results with previously published work (do your results make sense? was your model better/worse than previous approaches?). What are limitations of your work? With your results in hand, what would you want to learn next (what are extensions)?

To help with organizing this information into the correct place, it might be helpful to reference an article as an example. Take a look at "Metagenomic binning and association of plasmids with bacterial host genomes using DNA methylation" -- it should be helpful as a model for the kind of content that should be in each section of your paper. <https://lewisuniversity.blackboard.com/bbcswebdav/pid-528830-dt-announcement-rid-33236908_1/xid-33236908_1>

Expectations for formating conventions that should be used are present in the Format Guide. Here's a summary of some issues I've seen and help for getting them corrected.

Verb tense: If you're writing about information that continues to be true (is not unique to your work), it should be written in present tense (and likely should be accompanied by an in text citation); if you are writing about steps you have performed or outcomes of your work, it should be written in past tense.

Headings: Please format headings and subheadings using the scheme that is present in the Format Guide -- in the Matters of Style section of the document, see part "G" (pages 4-5).

Conventions for writing gene vs protein names, numbers, units and all of that good stuff: We will use the rules as described in the NCBI Style Guide (https://www.ncbi.nlm.nih.gov/books/NBK995/ )-- check out Chapter 5 for Style Points and Conventions.

Legends for data panels: Each data panel must be accompanied by a number and a title; if necessary, the legend should follow immediately after the title. Avoid providing "double" titles (do not also have a title included within the panel itself). If an abbreviation is incorporated into the data panel and that abbreviation has already been defined in the main text, you do not need to define the abbreviation again. However, if a unique abbreviation is used in the context of the data panel, that needs to be defined as part of the legend. Typically, full sentences should be used within the legend, and only enough description to understand the components within the data panel. A more complete synopsis of what is shown in the panel needs to be provided in the accompanying text of the Results section, but this is distinct from the legend.

Tables should have their label placed immediately above the data panel. Example: Table 1. Genomes binned from adult mouse gut microbiome using DNA methylation profiles.

Figures should have their label placed immediately below the data panel. Example: Figure 1. Overview of metagenomic binning using DNA methylation detected in SMRT long reads.

This week you will also need to outline your oral presentation. Because this is all based on the same project, the draft and the outline should really be complementary (hopefully as one takes shape, the other will be very similar). Don't forget that the University will officially by closed Thursday and Friday of this week for the Fourth of July holiday, and this will impact campus-based resources. I will be traveling Thursday - Sunday; although I will check my email at least once a day, response time will be delayed so please plan accordingly.

If you have any questions, please do not hesitate to email me!