BIEN 202 SP20 Project 2

Objective

Perform a reproducible analysis and communicate it using contemporary tools:

- Prepare a reproducible report using literate programming in either a MATLAB live script, a Jupyter Notebook, or Rmarkdown
- Include a description of your programming environment
  - This could be embedded at the end of your report using sessionInfo() in R or ver in Matlab
  - This could be an conda environment.yml file included in your GitHub repository
- Host your analysis on Github (private repositories are fine)
- Provide any data on Github, or include the commands to acquire your data in a script
- Present your analysis the class, briefly describing your code and technical approach

To turn your project in, provide me (jchartron) access to your Github repository

I should be able to understand your rationale and conclusions.
I should be able to regenerate all of your figures from your code.
If you use any commercial software, please let me know so I can try to acquire it.

Suggested Topics

- You may expand upon your topic from Project I, or rewrite it in another language
- You may use a topic from your independent research
- You may reproduce an analysis from the literature (appropriately cite)
- You may build off examples and tutorials introduced in class
  - We'll do FBA and COBRA analysis on Week 8 - perhaps engineer a cell to produce a metabolite?
  - We'll do differential gene expression on Week 9 - perhaps identify condition-specific promoters?

For an independent head start on differential gene expression:

- You may use any of the examples in chapter 4 of https://www.bioconductor.org/packages/release/bioc/vignettes/edgeR/inst/doc/edgeRUsersGuide.pdf
- You may use: http://master.bioconductor.org/packages/release/workflows/vignettes/rnaseqGene/inst/doc/rnaseqGene.html
- You may use: http://bioconductor.org/packages/release/bioc/vignettes/DESeq2/inst/doc/DESeq2.html

If you reproduce a tutorial or published analysis, try to understand every step. I will treat it as if it were your own work!

Due dates

Presentations will occur during Week 10

Please let me know of any conflicts with M.S. exams

Final write-ups will need to be completed by the end of Finals week, June 12th at 11:59 p.m.