

BI586 2021 Homework Assignment 2 (15 points total, 15% of grade each)
Transcriptomics/Gene expression: Re-analyses of Gene Expression data

Assignment: In a group of 3 students, use a previously published dataset provided by the instructor to analyze gene expression differences in the experiment by modifying the scripts you used in class. You will then compare and contrast what you found with the original study.

Part 1: Code, RMarkdown, and Interpretation (10 points total, 10% of grade)

Format: All bioinformatics should be documented using RMarkdown and handed in via Github.

All groups will conduct:

1) DESeq2 Analysis

Optional analyses include:

1) GO Enrichment Analysis

2) WGCNA

Be sure to include the following in the RMarkdown document:

Introduction (1 pt): At the top of the document, include a title, list of authors, and an introduction to the project you are re-analyzing. This introduction should be a brief overview of what you did and why, including the data you analyzed, methods you chose. An abstract of sorts, but don't just copy the abstract from the publication.

Version control (0.5 pt): At the top of the RMarkdown document, include what version of R you are working in and the versions of all packages.

Data analysis/methods (4 pts): Include detailed annotations at each step of the data analysis, which will include informative comments that summarize and justify the next step below. Within these sections of the document, additionally justify parameters used or reasoning behind methods you chose as necessary.

Figures (4 pts): Include all *final* (including appropriate axis labels, legend, etc.) figures generated throughout the analysis. Good to explain what each figure generally means just below it to help the people using your RMarkdown. At minimum you should include a PCA, venn diagram and heatmap figures in order to adequately explore the data.

Conclusion (0.5 pt): Include a couple of sentences at the end of the document summarizing the findings of the analysis. Include how your findings compare with the original study.

Assignments are due at 5pm on March 30, 2021 via email to daviessw@gmail.com

Part 2: 12 min Presentation of research (5 points, 5% of grade) Zoom Mar 30th 9-10:45am

A. Presentation /2

-Effective and creative presentation of material /1

-All group members participated equally and finished on time /1

B. Knowledge /3

-Knowledge of analyses performed /2

-Interpretation of results /1

Peer grades are also due by 5pm using the peer grading form available on the Github

Please grade each of your groupmates out of 100% based on effort towards assignment and effort towards the presentation