

Instructions: In these assignments the goal will be to compare the from scratch processes we looked at in class, to the functionality of built-in functions that perform similar tasks. You should compare the functionality of our custom-built examples and the ability to further customize them, to the functionality of package functions. Describe any limitations of the from-scratch versions and the built-in functions. Run an example dataset through both and compare the results.

Submission: Create a Word document that discusses the comparison. Include graphs and explanations here, which package functions you are comparing, etc. With your submission, include your R code file.

Tasks:

1. Compare our by-hand algorithm for regression to the functionality of the `lm()` package. Compare what the documentation says it can do to how our function performs. Run on a sample dataset and compare the outcomes. Plot the results.
2. Try to apply the `residual()` function (<https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/residuals>) in R to various regression packages such as `lm()`, `glm()`, the functions from `glmnet`, `loess()`, `splines`, gaussian process regression (your choice of package), etc. On which functions does it work, and on which ones does it not work? Apply the functions to a simple example, such as the orange (built-in) dataset. (choose at least 4 functions to test.)