Homework 1

MSSC 6000 — Scientific Computing — Spring 2023

Due Monday, Feb 6, on D2L, by 11:59pm

Complete each of the problems below from https://projecteuler.net. Submit your work as four separate python files, one for each problem. Your file names should include your last name and the problem number.

I will run your code on my computer. It should print out nothing except the final answer. Your goal should be for your code to run in at most 60 seconds. (A little bit over is fine because of variance, but it should definitely not take more than 2 minutes.) Keep in mind that you can use projecteuler.net to check that you're getting the right answers.

Please do not look up the answers to these questions or code to solve them. They will be super easy to find, but it totally defeats the purpose of this homework, which is to help you learn Python as preparation for the more mathematical topics we will reach soon. **Be sure to cite any external resources you used (including discussions with classmates) in completing this assignment. You can do this as a comment at the top of your code files.**

1. Complete problem 4, "Largest palindrome product." **Hint:** try casting your integer to a string to reverse it, then cast back to an integer (if you want a challenge, try to do this one line)
2. Complete problem 14, "Longest Collatz sequence." **Hint:** be careful to make sure you're always dealing with integers, not accidentally converting to floats (e.g.., $10/2 = 5.0$, not 5)
3. Complete problem 29, "Distinct powers." **Hint:** it is possible to do this in one line too! (You don't need to though.)
4. Complete problem 34, "Digit factorials." Even this can be done in one line (not counting imports), but it's more challenging and you don't need to!