

ECE 345: Bonus Assignment Commentary

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Introduction

Overall, I was very pleased with the submissions of the bonus assignment because it seemed that many students genuinely learned something new about *actually* implementing algorithms and data structures.

I like to think of this course as a lesson in thinking. Too many times students rush into coding without first thinking about the problem and the end result is subpar (as you would expect). This course tries to reinforce the thinking aspect because there is no actual coding! Having said that, there is really no substitute to actually trying to solve a problem in code and that's exactly what I was trying to do in this bonus assignment.

I hope all students who participated in this assignment had fun and learned some practical lessons about algorithms and data structures.

Remarks on Results

There were nearly 21 students who submitted the bonus assignment, however, there was a big variation in quality between the results. Only two students managed to pass every one of my 20 testcases (which included the five sample ones). Unfortunately, five students also has problems with their submissions or were unable to get any correct outputs.

The submissions used a variety of different methods to solve the problem, the most popular solution was using Manacher's algorithm to find a list of palindromes in the first line and various methods to search the rest of the lines to verify it was correct. This proved to be a very efficient algorithm because on the largest testcase, which was more than 300 MB, some solutions ran in less than a second. This trounced my reference implementation which used a brute force approach.

The most creative solution (and nicest report) that I saw was using a tree to store half palindromes found in each line. If a palindrome isn't visited during a line, it is pruned. Quite an interesting solution especially since it was probably much easier using Manacher's algorithm (where many reference implementations are readily available).