MET 330 Test 1 Reflection Due: 2/22/22

The contents of this test encompass several course objectives that we exercised in the homework assignments. Specifically, the exam required us to compute pressure and forces in a stagnant fluid, explain dynamics in pipes and fittings, calculate friction losses, and apply the conservation of energy through Bernoulli's equation.

For Problem 1, my methodology was, for the most part, very similar to the provided solution. My final answer for deflection was similar but was still off because of a small mistake I had made when plugging in numbers: I had put 62.4 instead of 62.2 as the specific weight of water, and that error carried through the rest of my calculations. The numbers in my spreadsheet were also correct, though it is admittedly less detailed than the solution's spreadsheet. I believe I should have explicitly noted each step in my calculations in the file rather than just the final answer.

My errors in problem 2 were more numerous. To begin with, for my diagram, I had focused on the wrong part of the system provided. Because of this, I had drawn the proper half of the system more than once throughout the problem to keep track of my work as I went. During this problem, the most critical error was that I had only calculated for two sources of energy loss rather than the four that the solution includes. This negatively affected my calculations for the remainder of the problem, namely pump power.

Additionally, I used the wrong equation for finding the pressure at the pump inlet. I had attempted to fulfill the spreadsheet's requirements as best as possible, but several factors also affected my answers for this portion. Namely, this would be calculating my data in US Customary units, which also complicated converting my answer in horsepower to kilowatts. This, in turn, caused my costs calculations and scatterplot to be way off as well. Were I to retake this test, I would redo my calculations in SI units.

As part of this reflection, I have evaluated my answers based on the rubric and solutions provided. I graded myself as such:

Writing: 9.55 / 10

Problem 1: 6.4 / 7 Problem 2: 3.7 / 9

Based on this, I would assign myself a grade of 63 out of 90 possible points - approximately 70%. My most significant area of weakness on this test was analyzing and including each relevant part of the problem.

While completing the exam, there were a few instances where I was unsure how to manipulate the equations to solve for the variable I was looking for. To assuage this, I attempted to look for similar problems done in class. While completing the test, I got to gain some experience relating to what goes into the design process when choosing parts for a system. Even when not directly related to fluid mechanics, cost, power used, and maintenance are all factors engineers utilize across different disciplines. Generally speaking, for the content learned in the course, I can say that I have applied similar concepts in other courses- namely thermal applications and thermodynamics as they often have fluids as the primary substances.

Regarding my effort on this first test, I would say that I usually do well on keeping my steps organized and easy to follow. I feel as though as I progressed through the test, my work got sloppier, which made way for making critical mistakes. I spent quite a long time on this test, and I feel that I could have utilized my time a lot better. I spent much time getting frustrated and mulling over my calculations. Next time, I would like to begin working on the test earlier to not be as stressed when I encounter something I have difficulty with.