Project 4 – ICEBERG AVOIDING PROBLEM

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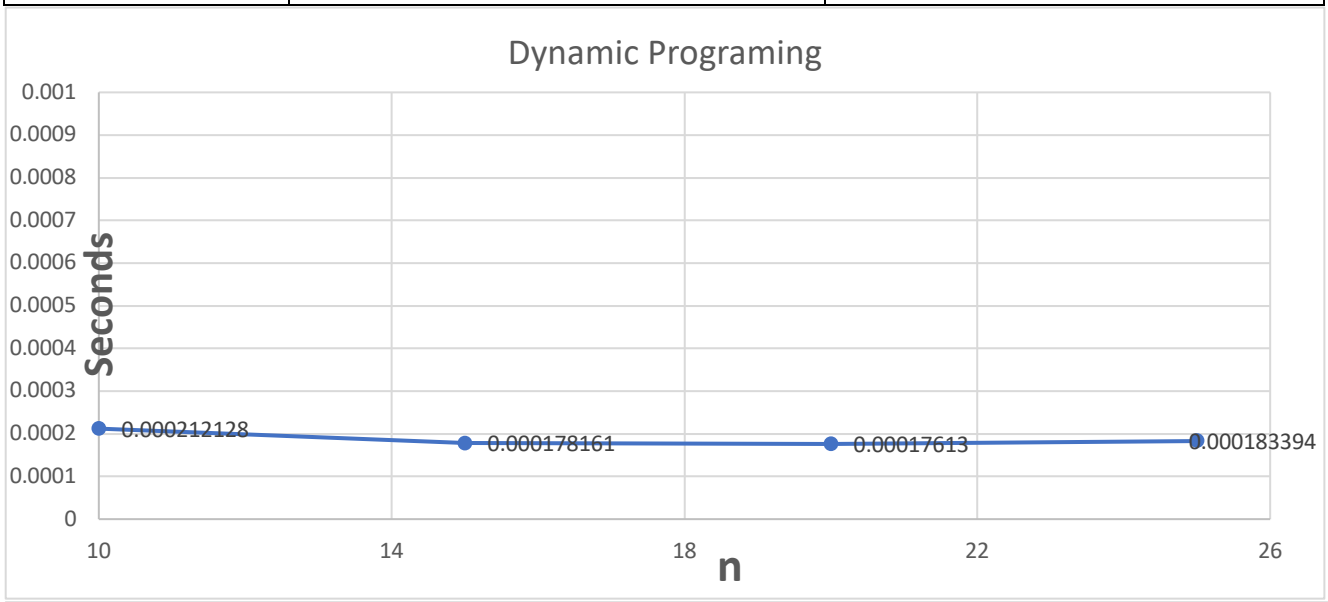
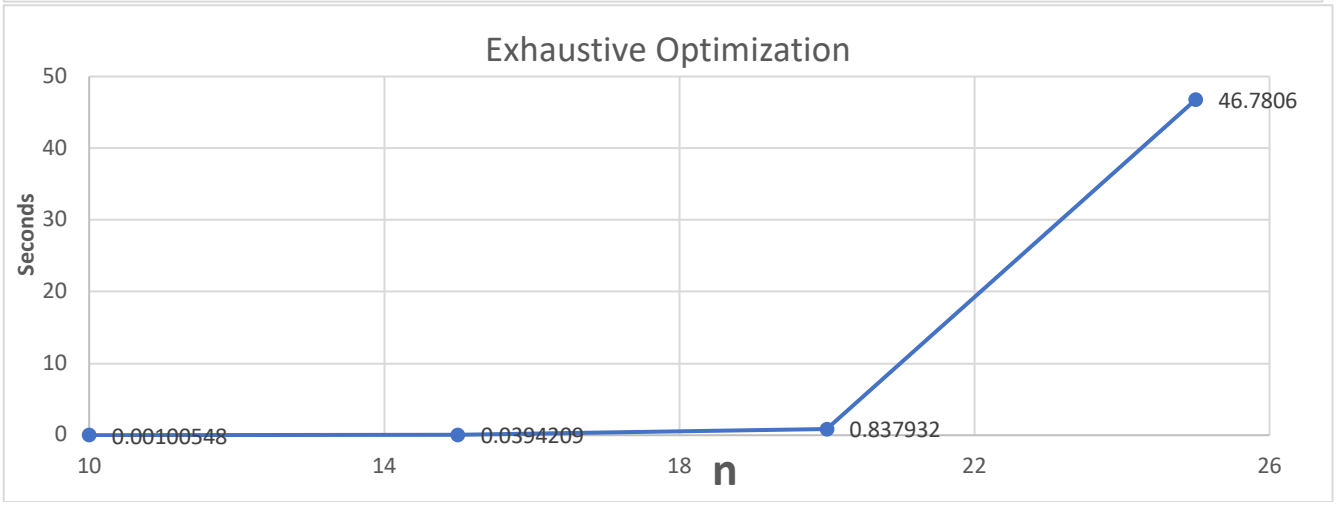
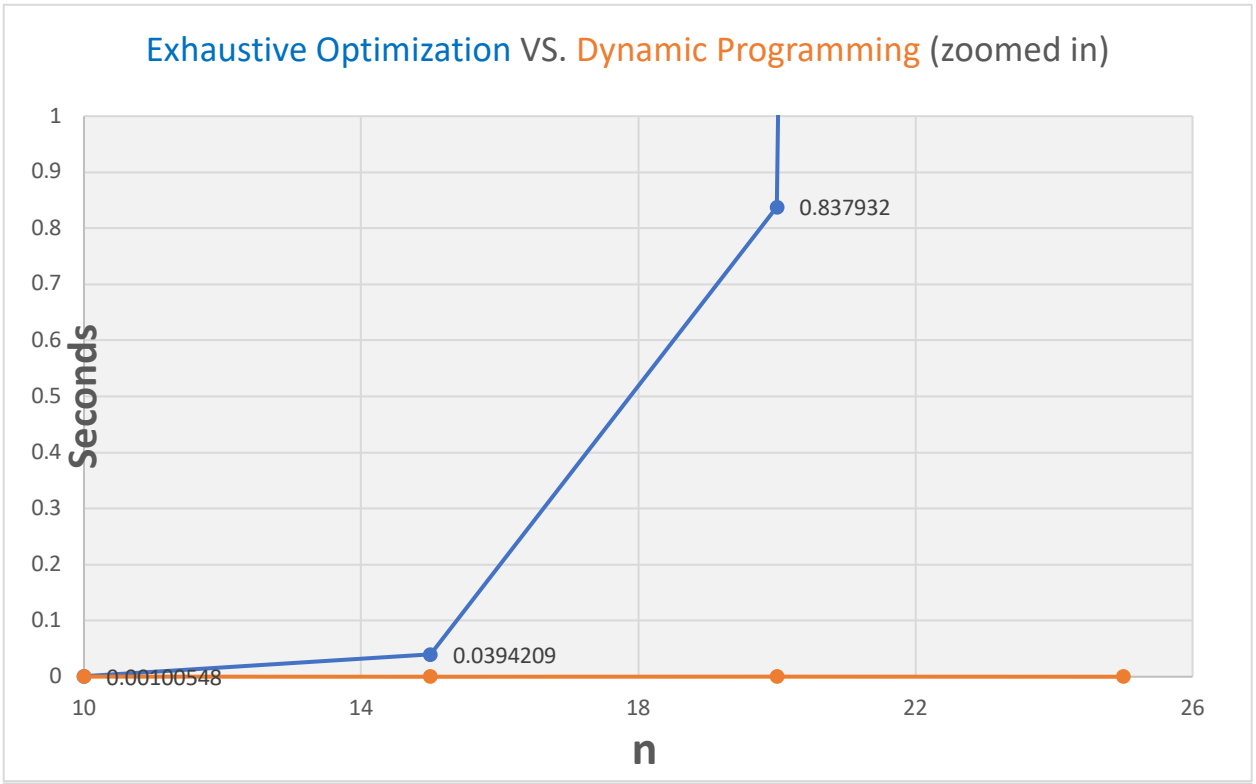
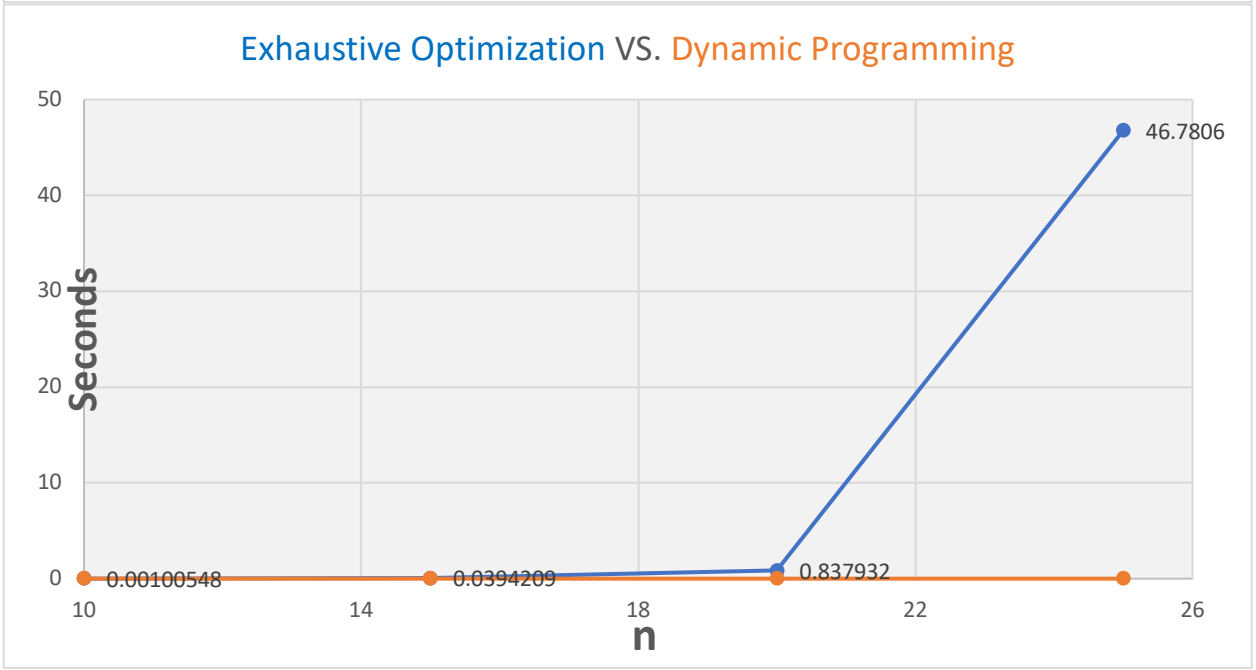
n	exhaustive optimization	dynamic programming
10	0.00100548	0.000212128
15	0.0394209	0.000178161
20	0.837932	0.00017613
25	46.7806	0.000183394









a. Are the fit lines on your scatter plots consistent with these efficiency classes? Justify your answer.
    1. Yes, exhaustive optimization time grows exponentially and is visible at n>20

b. Is this evidence consistent or inconsistent with the hypothesis stated on the first page? Justify your answer.

Polynomial-time dynamic programming algorithms are more efficient than exponential-time exhaustive search algorithms that solve the same problem.

Yes, the evidence is consistent with the hypothesis; polynomial dynamic programming algorithms are more efficient than exponential time exhaustive search algorithms. You can see in the scatter plots that compare the two, when setting n>20, exhaustive optimization becomes extremely inefficient and downright unusable at n>25.

c. Compare and contrast the difficulty you found in implementing the two algorithms. What was the most challenging part of implementing each algorithm. Overall, which implementation did you find harder, and why? Which algorithm implementation do you prefer?

1. The Exhaustive optimization algorithm is more complicated to implement. If certain aspects of the pseudo were not given like the bitwise operations, it would have been significantly harder to implement. I prefer the dynamic method as the implementation is faster and less complicated to follow.