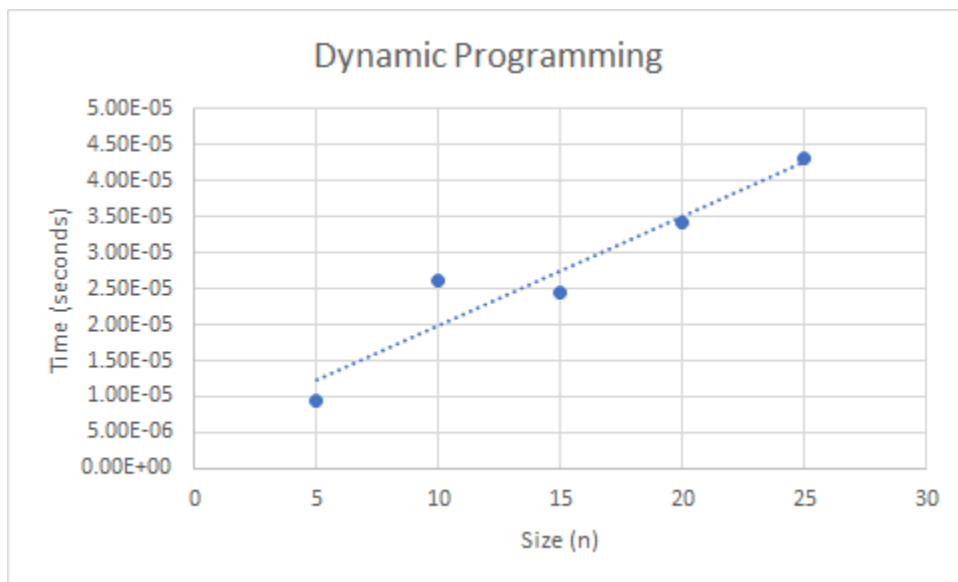
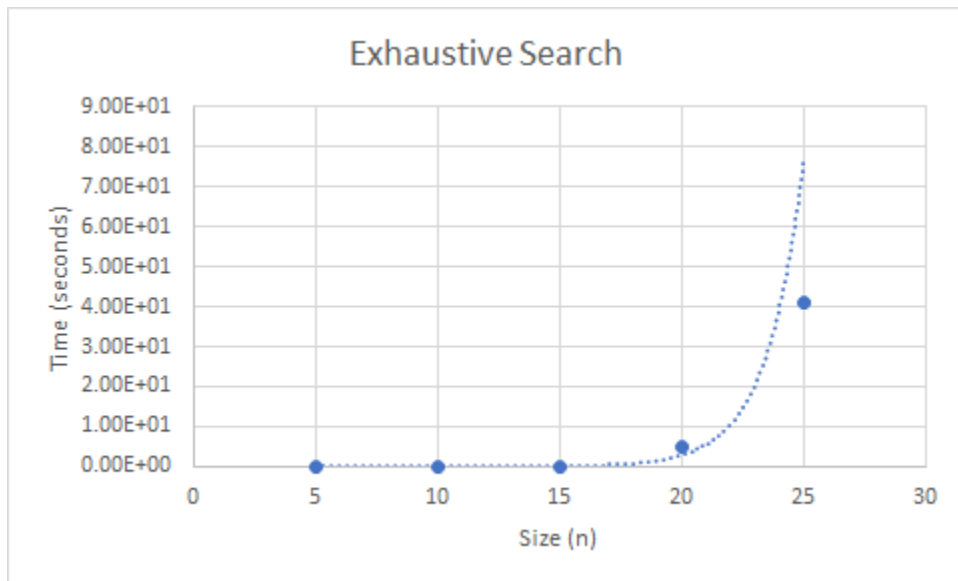


Project 2: Polynomial vs Exponential Time Empirical Analysis

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2) Scatter plots for each of the two algorithms.



3) Answers to the following questions. (Each answer should be at least one complete sentence.

1. Is there a noticeable difference in the performance of the two algorithms? Which is fastest, and by how much? Does this surprise you?

The dynamic programming algorithm seems to be faster than the exhaustive search algorithm. This didn't surprise us since the time complexity of the exhaustive search algorithm is $O(n^2n)$ which is much slower than the time complexity of the other algorithm which is $O(n^2)$.

1. Are your empirical analyses consistent with the predicted big-O efficiency class for each algorithm? Justify your answer.

Our empirical analysis results do appear to be consistent with the predicted big-O efficiency class for the algorithms that were given $O(n^2n)$ for exhaustive search and $O(n^2)$ for dynamic programming. It would seem that the exhaustive search ran slower than the dynamic programming algorithm. Every run with n on the dynamic programming algorithm is in the range of 10^{-05} which is faster than the times in the exhaustive algorithm.

1. Is this evidence consistent or inconsistent with hypothesis 1? Justify your answer.

This evidence would be consistent with hypothesis 1 since it is feasible or possible to implement an exhaustive search algorithm and for them to produce a correct output, but the issue here would be the run time. An exhaustive search algorithm would produce a correct output, but it would just be too slow.

1. Is this evidence consistent or inconsistent with hypothesis 2? Justify your answer.

The evidence is consistent with hypothesis 2, since it is true that it's not ideal or practical to run an algorithm that runs in exponential or factorial time since it would be too slow.