

Problem set 3

1. Exercise 3.1-4.

2. List in order from asymptotically slowest (long time to run as a function of input size n) to fastest the following functions. If functions are asymptotically similar, list them together. Explain.

$$n!, n^n, n^3, \log_2 n, n \log_2 n, \log_5 n, n^{1.2}, \left(\frac{5}{4}\right)^n, n^{2.8}$$

3. Strassen in his matrix multiplication problem found a way to compute matrix multiplication with only 7 recursions. We calculated the complexity using the master theorem in class. What would be the complexity if someone clever found a way to compute matrix multiplication with only 5 recursions? What about with only 2 recursions? Write out the recursive equation and solve with the master theorem.