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Algorithms H

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Homework #7

1.4.5

- a. $\sim N - O(n) O(n^2) O(n^3) \Omega(1) \Omega(n) \Theta(n^2) \Theta(n^3)$
- b. $\sim 1 - O(1) O(n) O(n^2) O(n^3) \Omega(1) \Theta(n) \Theta(n^2) \Theta(n^3)$
- c. $\sim 1 - O(1) O(n) O(n^2) O(n^3) \Omega(1) \Theta(n) \Theta(n^2) \Theta(n^3)$
- d. $\sim N^3 - O(n^3) \Omega(1) \Omega(n) \Omega(n^2)$
- e. $\sim 1 - O(n) O(n^2) O(n^3) \Omega(1) \Theta(n) \Theta(n^2) \Theta(n^3)$
- f. $\sim N O(n) O(n^2) O(n^3) \Omega(1) \Omega(n) \Theta(n^2) \Theta(n^3)$
- g. ~ 0

1.4.6

- a. First iteration is N second is $N/2$ third is $N/4$ fourth is $N/8$ as such it sums to $2N$
 - i. $4n$ additions(not counting the $n/2$ as a multiplication).
- b. This will be adding $1+2+4+8$ the inner loop is essentially i as such, this will sum to $2N$ as well
 - i. $6n$ additions($4n$ additions and $2n$ multiplications)
- c. So this will run $\ln(N)$ times and each iteration takes N times to run as such its $N\ln(N)$
 - i. $6N\ln(N)$

