

G22.1170 Fundamental Algorithms
Problem Set 1
(Due Tuesday, October 24, 2000)

November 2, 2000

1 Problem 0.1 a

13
1, 2, 8, 12, 14
5
6
7, 10
3, 9
4, 11
15

2 Problem 0.1 b

1. true
2. true

3 Problem 0.1 c

1. false
2. false

4 Problem 0.2

- a. $T(n) = T(0) + n^2(n + 1)^2$
- b. $\begin{cases} T(1) = 1 \\ T(N) = 4T(N - 1) + 1 \end{cases}$

5 Problem 0.3

Fib1 $T(n) = O(2^{n-1})$

Fib2 $T(n) = O(n)$

6 Problem 0.4

1. $T(n) = 5n - 4$
2. $T(n) = O(n)$
3. $T(n) = O(n \log_{0.8} n)$

7 Problem 0.5

- a. $T_m(n) = O(n \log^m n)$
- b. $T_m(n) = 2^{\frac{m(m+1)}{2}} + (2^m - 1)n$
- c. There is no any m that the Sure R's algorithms is more efficient than Dupe R's.