**Ping Ju**

**CSCI 190 GROUP ASSIGNMENT**

**WEEK 10**

**Ch. 8.3 Q's 1, 7**

1. **How many comparisons are needed for a binary search in a set of 64 elements?**

**Let f(n) = number of comparisons needed in a binary search of a list of n elements.**
**f(n) = f(n/2)+2**
**f(1) = 2**
**f(64) = f(64/2) + 2 = f(32) + 2 = f(16) + 4 = f(8) + 6 = f(4) + 8 = f(2) + 10 = f(1) + 12 = 2+12=14**

7. **f(n)=f(n/3)+1 when n is a positive integer divisible by 3, f(1)=1**

a) **f(3) = f(1) + 1 = 1 + 1 = 2**

b) **f(9) = f(3) + 1 = 2 + 1 = 3;**
**f(27) = f(9) + 1 = 3 +1 = 4**

c) **f(81) = f(27) + 1 = 4 + 1 = 5;**
**f(243) = f(81) + 1 = 5 + 1 = 6;**
**f(729) = f(243) + 1 = 6 + 1 = 7**