Algorithm Design for Project 1

Wesley Friday (imansjin@csu.fullerton.edu)

The Left-to-right Algorithm

Create swap counter variable and set it to 0
Create a current and next variable, set current to 0 and next to 1
Create, While a list of disk is unsorted,
    If list index at current is light disk(1) && next list index is dark disk(0)
        Swap Disks
        Swap counter++ (by 1)
     current++ and next++
    Check if current is equal to the list size - 2
        Reset current = 0 and next = 1
Return list of disk and swap counter, exit while loop.

16n^2+3
f(n)<=g(n^2)
Lim (16n^2 +3)/ n^2 = 16
So we can see this is an element of O(n^2)

The Lawnmower Algorithm

Create swap counter variable and set it to 0
Create, While a list of disk is unsorted,
    Create for loop that iterates from 0 to list the disk size
        If list at index [i] is light(1) and list index is 1 is dark
            Swap Disks
            Swap counter++ (by 1)
    Create for loop that iterates from index list disk size by subtracting 1 to 1
        If list at index [i] is dark(0) and list index i-1 is light
            Swap Disks
            Swap counter++ (by 1)
Return list and swap counter, exit while loop

S.C: 1 + n/2 * ((2n - 1 * (6 + 4)) + (2n - 1 * (6 + 5)))

1+ n/2 * (20n - 10 + 22n - 22) 1 + n/2 (42n - 32) 1 + 21n^2 - 32n/2
f(n) <= g(n)
Lim 21n^2 - 32n/2 + 1 / n^2 = 42n - 32/2 / n = 42
So we can see this is an element of O(n^2)

Screenshot