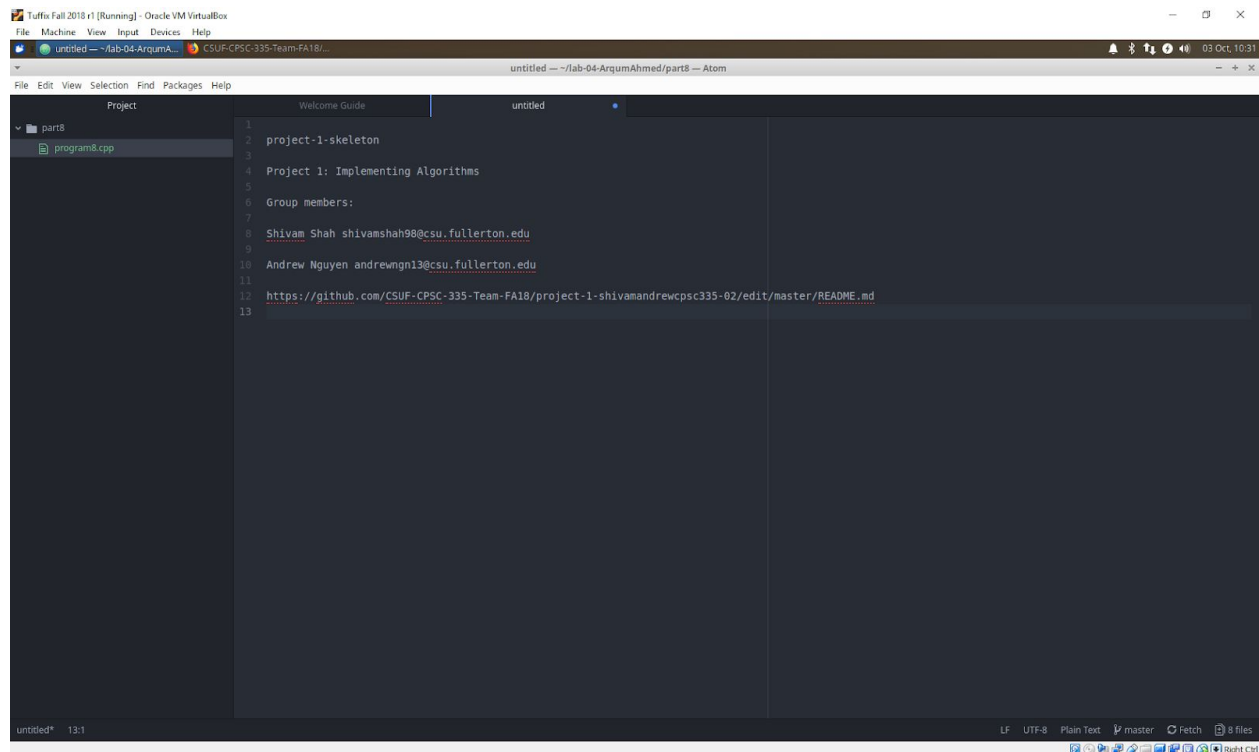CPSC 335 Project 1 PDF Submission
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3 and 4 /*
  a. Pseudocode left to right
sorted_disks sort_left_to_right(const disk_state& before) {
        int swap = 0; 1 TS
        disk_state after = before; 1 TS
        for r = 0 to size do n times
                for c = 0 to size-1 do n - 1 times
                        if get(i) is the dark disk and get(i+1) is the light disk{ 3 + max(7,0)
                                swap(get(i)) 5 TS we were told that std:: swap has 3 TS
                                swap++; 2 TS
                        }
        Return new disk with swap count.
}

10(n-1)(n) +3 = (10n-10)(n) + 3 = 10n^2 - 10n +3 which would make this O(n^2) which makes sense

Proof:

Lim 10n^2-10n+3/ n^2 = n^2(10 - 10/n + 3/n^2)/n^2 = 10 - 10/n + 3/n^2 = 10 so because its finite
and because the value is greater = to 1 it 10n^2-10n+3 =s O(n^2)

x->inf

b. Pseudocode lawnmower

```
sorted_disks sort_lawnmower(const disk_state& before) {
        int swap_num = 0; 1 TS
        disk_state after = before; 1 TS
        Int size = total_count() 1 TS
        for c = 0 to size do { n times
                for i = 0 to size-1 do n-1 times
                        If get(i) is dark dist and get(i+1) is light disk{ 3 + max(7,0)
                                swap(get(i)) 5 TS
                                swap_num++ 2 TS
                        }
                Size-- // we are subtracting size as said in algorithm
                for t = size -1 to 1 do n - 1 times
                        If get(i) is light disk and get(i-1) is dark disk { 3 + max(7,0)
                                swap(get(i-1)) 5 TS
                                Swap_num++ 2 TS
                        }
        }
        Return new disk with swap count. 1 TS

}
```

(10(n-1) + 10(n-1)) * n + 1 +1 +1 = (20(n-1))(n) + 3 = (20n-20)(n)+3 = (20n^2+20n+3) = O(n^2)

Proof:

Lim (20n^2+20n+3)/ n^2 = n^2 (20n^2+20n+3)/n^2 = (20 + 20/n+3/n^2) = 20 so because its
x->inf finite and because the value is greater = to 1 it (20n^2+20n+3) =s O(n^2)