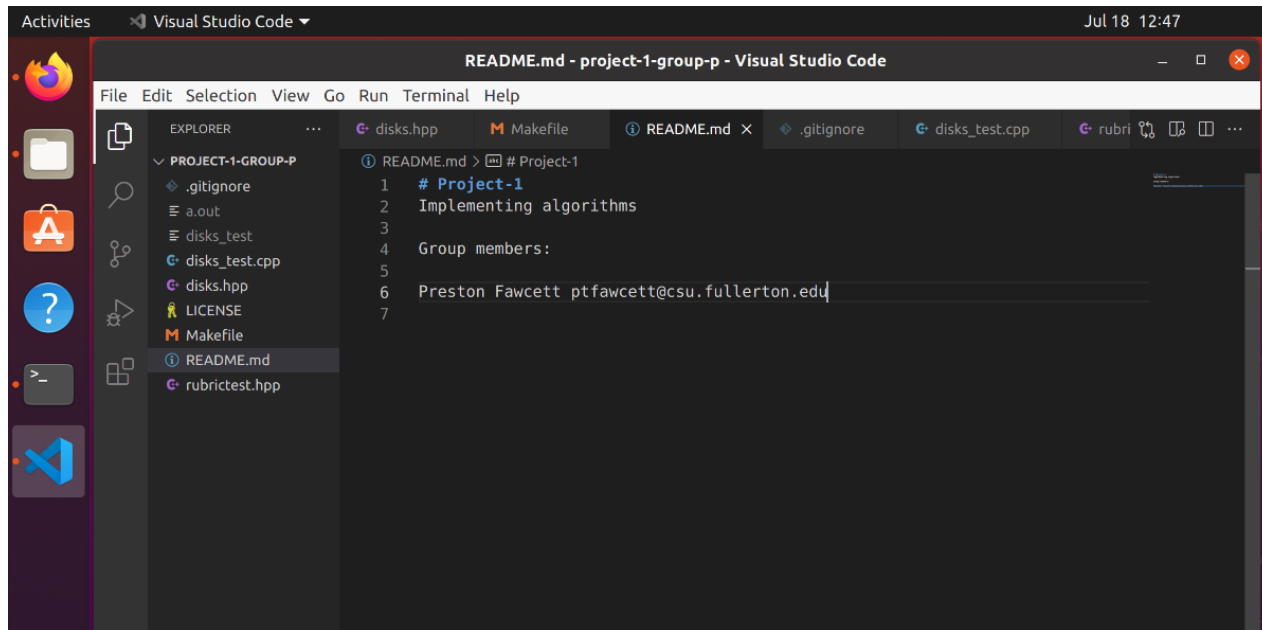


## Project 1 - Implementing algorithms

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```
Username for 'https://github.com': PrestonFawcett
Password for 'https://PrestonFawcett@github.com':
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 376 bytes | 376.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/CSUF-CPSC-335-Bein-SU21/project-1-group-p.git
 18b5d91..f25b31f  main -> main
preston@Lynx:~/cpsec-335/project-1-group-p$ make
g++ -std=c++11 -Wall disks_test.cpp -o disks_test
./disks_test
disk_state still works: passed, score 1/1
sorted_disks still works: passed, score 1/1
disk_state::is_initialized: passed, score 3/3
disk_state::is_sorted: passed, score 3/3
alternate, n=4: passed, score 1/1
alternate, n=3: passed, score 1/1
alternate, other values: passed, score 1/1
lawnmower, n=4: passed, score 1/1
lawnmower, n=3: passed, score 1/1
lawnmower, other values: passed, score 1/1
TOTAL SCORE = 14 / 14
preston@Lynx:~/cpsec-335/project-1-group-p$
```

```

def sort_lawnmower()
    for i=1 to n/2 do
        for i=0 up to and not including total_count-1
            if list[i] == light && list[i+1] == dark
                swap(i)
                Swap_count++
        for i=total_count-1 to and not including 0
            if list[i-1] == light && list[i] == dark
                swap(i-1)
                Swap_count++
    return sorted_disks
    n/2 * [(2n-1)*(8) + (2n-1)*(9)] = n/2 * (34n-17) = 17n2-8n

```

sc:  $n/2 - 1 + 1 = n/2$   
 sc:  $(2n-1) - 0 = 2n-1$   
 sc:  $4 + \max(4, 0) = 8$   
 sc: 3  
 sc: 1  
 sc:  $[0 - (2n-1)] / -1 = 2n-1$   
 sc:  $4 + \max(5, 0) = 9$   
 sc: 4  
 sc: 1

Does  $17n^2 - 8n$  belong to  $O(n^2)$  :  $17n^2 - 8n \leq C * n^2$

$C = 17 + 8 = 25$  :  $n = 1$

$17n^2 - 8n \leq 25n^2$

$25n^2 - 17n^2 + 8n \geq 0$

$8n^2 + 8n \geq 0$

$16 \geq 0$  **Yes, belongs to  $O(n^2)$**

```

def sort_alternate()
    for i=1 to n do
        for i=0 to and not including total_count-1 step by 2
            if list[i] == light && list[i+1] == dark
                swap(i)
                Swap_count++
        for i=1 to and not including total_count-1 step by 2
            if list[i] == light && list[i+1] == dark
                swap(i)
                Swap_count++
    return sorted_disks
    n * [(n)*(8) + (n-1)*(8)] = n * (16n-8) = 16n2-8n

```

sc:  $n - 1 + 1 = n$   
 sc:  $[(2n-1) - 0] / 2 = n$   
 sc:  $4 + \max(4, 0) = 8$   
 sc: 3  
 sc: 1  
 sc:  $[(2n-1) - 1] / 2 = n-1$   
 sc:  $4 + \max(4, 0) = 8$   
 sc: 3  
 sc: 1

Does  $16n^2 - 8n$  belong to  $O(n^2)$  :  $16n^2 - 8n \leq C * n^2$

$C = 16 + 8 = 24$  :  $n = 1$

$16n^2 - 8n \leq 24n^2$

$24n^2 - 16n^2 + 8n \geq 0$

$8n^2 + 8n \geq 0$

$16 \geq 0$  **Yes, belongs to  $O(n^2)$**