Lawnmower Algorithm Pseudocode:

```
n = number of disks
numSwaps = number of swaps

for i = 0 to n - 1 do   // n-1 - 0 + 1 = n
      j = 1 // 1 tu
      bool back = false // 1 tu
      while(j >= 1) // 2 * ((2n - 1) * 10)
            if diskArray[j - 1] == black && diskArray[j] != black// 4 tu
                  swap(diskArray[j-1], diskArray[j]) // 1 tu
                  numSwaps++ // 1 tu
            if j == 2n-1 // 2 tu
                  back = true // 1 tu
            if back
                  j-- // 1 tu
            else                          // max(1, 1)
                  j++ // 1 tu
      #endwhile
#endfor
return diskArray
```

Proof:

$2n + (n(2((2n-1) * 10)))$

$2n + (n(2(20n-10))$

$2n + (n(40n-20))$

$2n + (40n^2-20n)$

$40n^2- 18n$

$f(n) = 40n^2 - 18n$

$g(n) = n^2$

$40n^2 - 18n <= c*n^2, n > n_0$

Let $c = 58, n_0 = 1$

$40n^2 - 18n <= 58n^2, n > 1$ or $40n^2 - 18n <= 40n^2 + 18n^2, n > 1$

This is trivially true.

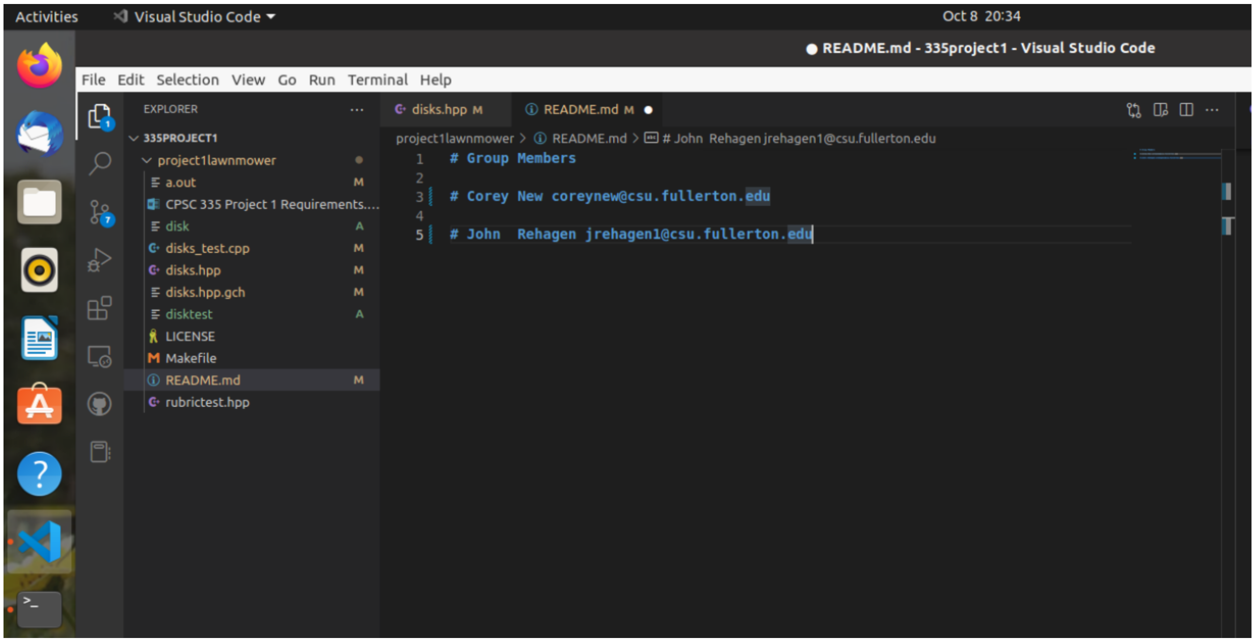
Alternate Algorithm:

```
swaps = 0 //1
for (i = 0 to n) //n + 1
    startValue = i % 2 //2
    for(j = startValue to 2n, step 2) //n
        If (j + 1 <= n) //2
            If (arr[j] == black && arr[j + 1] == white) //4
                temp = arr[j + 1]   //2
                arr[j + 1] = arr[j]  //2
                arr[j] = temp        //1
                swaps++              //1
            endif
        endif
    endfor
endfor
return(arr, swaps)
```

1 + 2*(n+1) + (n + 1)12n
1 + 2n + 2 + 12n^2 + 12n
12n^2 + 14n + 3

f(n) = 11n^2 + 14n + 3
g(n) = n^2
12n^2 + 14n + 3 <= c*n^2, n > $n_0$

Let c = 29 $n_0$ = 1
12n^2 + 14n + 3 <= 29n^2, n > 1 or 12n^2 + 14n + 3 <= 12n^2 + 14n^2 + 3n^2, n > 1
This is trivially true.


Activities
Visual Studio Code
Oct 8 20:34
README.md - 335project1 - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
335PROJECT1
project1lawnmower
a.out
CPSC 335 Project 1 Requirements....
disk
disks_test.cpp
disks.hpp
disks.hpp.gch
disktest
LICENSE
Makefile
README.md
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README.md M
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