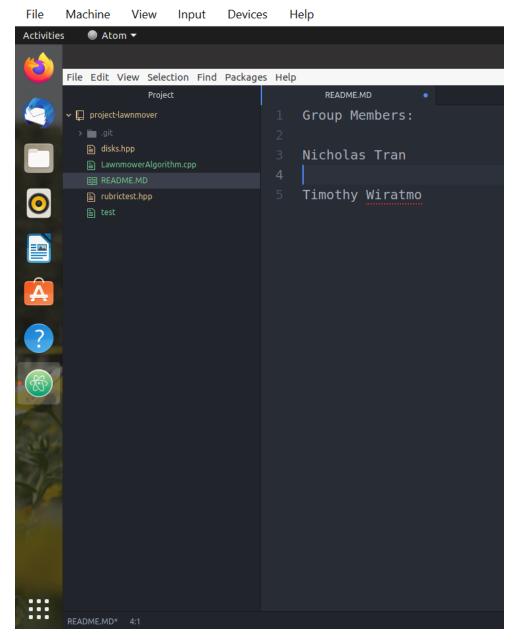
Project 1

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Tuffix 2020 Edition [Running] - Oracle VM VirtualBox



```
student@tuffix-vm:~/Desktop/CPSC 335/project-lawnmover$ g++ LawnmowerAlgorithm.cpp -o test
student@tuffix-vm:~/Desktop/CPSC 335/project-lawnmover$ ./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
student@tuffix-vm:~/Desktop/CPSC 335/project-lawnmover$
```

Lawnmower Algorithm

```
{
        bool isSorted = false; // 1 tu
        int numOfSwap = 0; // 1 tu
       while (isSorted == false) { // n times
               int swapCheck = numOfSwap; // 2 tu
               int loopCount = 0; // 1 tu
               while (loopCount < ([list size] - 1)) { // n - 1 times
                       if (left = dark && right == light) { // 2 tu
                               swap; // 1 tu
                               numOfSwap++; // 1 tu
                       }
                       loopCount++; // 1 tu
               }
               while (loopCount > 1) { // n - 1 times
                       if (left = dark && right == light) { // 2 tu
                               swap; // 1 tu
                               numOfSwap++ // 1 tu
                       loopcount-- // 1 tu
               }
               if (numOfSwap == swapCheck) // 1 tu
                       isSorted == true; // 1 tu
       }
}
```

$$2 + \left(n \times 3 \left(\frac{2n-1}{3} \times \left(4+1\right) \right) \left(\frac{2n-1}{4} \times 4+1\right) + 2\right)$$

$$2 + \left(\frac{3n(5n-5)}{5n-5}\right) \left(\frac{5n-5}{5n-5}\right) + 2$$

$$2 + \left(\frac{15n^2-15n}{5n^2-15n}\right) \left(\frac{5n-3}{5n-5n+3}\right)$$

$$2 + \left(\frac{75n^3-45n^2-75n^2+45n}{2+15n(5n^2-3n-5n+3)} + \frac{45n}{5n^2-3n-5n+3}\right)$$

$$2 + \left(\frac{5n^2-8n+3}{5n^2-8n+3}\right) \in O(n^2)$$

$$2 + \left(\frac{5n^2-8n+3}{2n-5n+3}\right) \in O(n^2)$$

$$2 + \left(\frac{5n^2-8n+3}{2n-5n+3}\right) \in O(n^2)$$

2+15n(5n¹-8n+3) <u>L</u> 33 n:1 2+15l 5 8+3) <u>L</u> 33 2+15l 5 8+3) <u>L</u> 33

Alternate Sort

```
{
        bool isSorted = false // 1 tu
       int numOfSwap = 0; // 1 tu
       int loopCount = 0; // 1 tu
       while (isSorted == false) { // n times
               int currentIndex = 0; // 1 tu
               int swapCheck = numOfSwap; // 1 tu
               while (currentIndex + loopCount < [listSize] - loopCount) { // n/2 times
                       if (left == dark && right == white) { // 2 tu
                              swap; // 1 tu
                              numOfSwap++ // 1 tu
                       }
                       currentIndex ++ // 1 tu
               }
               if (swapCheck == numOfSwap && loopCount != 0) // 2 tu
                       isSorted = true; // 1 tu
               else
                       loopCount++; // 1 tu
       }
}
```

3+(2n(n)(4)+1+3 7+2n(2n) $7+2n^2$ $7+4n^2 \leq 11n^2$ $7+41 \leq 11 \sqrt{1}$ $7+41 \leq 11 \sqrt{1}$ $7+41 \leq 11 \sqrt{1}$ $11+21 \leq 11 \sqrt{1}$