Report
Homework 3
by 0810981 安實克

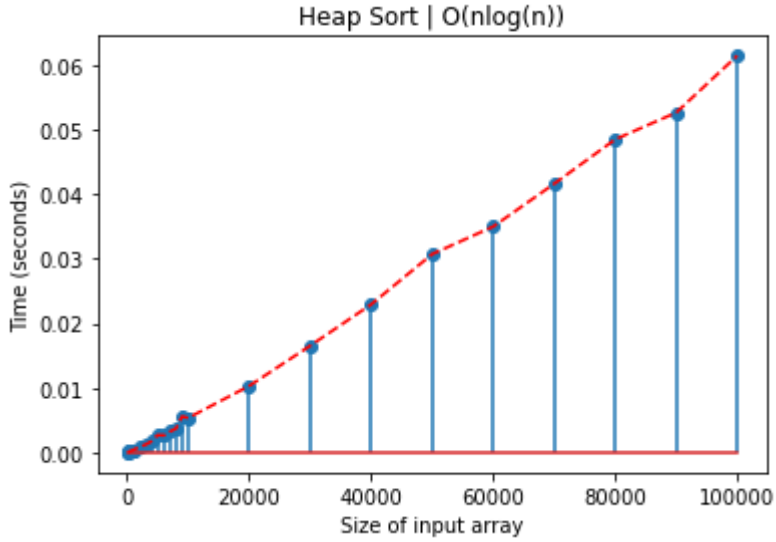
check my github repository for more data -> [github]

Screenshot of run time of Heap Sort algorithm with input sizes
[100, 1000, 10000, 100000]

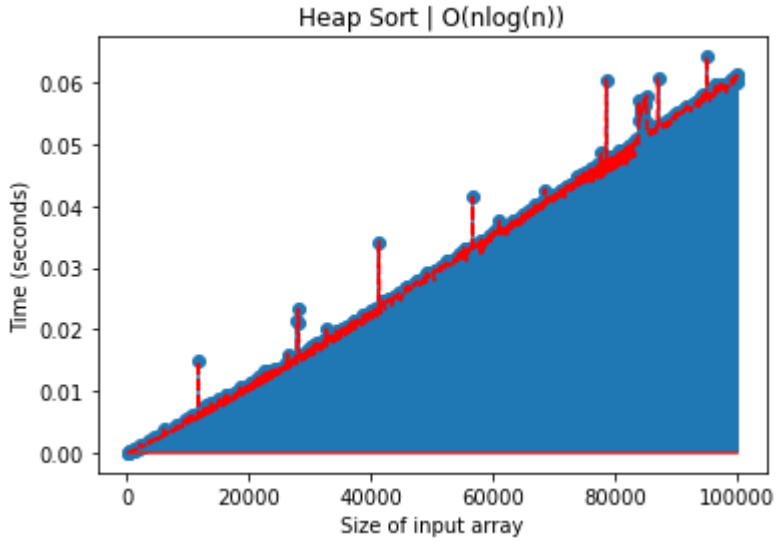
```
(base) raksa@pop-os:~/Education/Introduction_to_Algorithms/hw3$ ./0810981_安實克_HW3.exe
Enter size of input array: 100
Not sorted:
75 -21 -6 -47 -27 -16 5 -84 22 94 -1 17 49 93 97 -52 -61 -69 -94 52 30 -6 91 32 32 -35 -63 17 -17 57 -97
 -14 -54 -20 -25 77 -75 -100 -96 53 75 27 23 -42 -67 -64 -96 -78 7 3 -81 -84 -75 10 -59 -17 -87 24 33 -9
9 -70 30 88 64 -78 -31 13 46 12 -30 -6 -43 -31 37 -34 -76 67 18 -96 -26 90 37 -42 38 -87 -65 8 10 16 98
-35 -21 96 97 -27 29 -34 48 94 -87

Sorted:
-100 -99 -97 -96 -96 -96 -94 -87 -87 -87 -84 -84 -81 -78 -78 -76 -75 -75 -70 -69 -67 -65 -64 -63 -61 -59
 -54 -52 -47 -43 -42 -42 -35 -35 -34 -34 -31 -31 -30 -27 -27 -26 -25 -21 -21 -20 -17 -17 -16 -14 -6 -6 -
6 -1 0 3 5 7 8 10 10 12 13 16 17 17 18 22 23 24 27 29 30 30 32 32 33 37 37 38 46 48 49 52 53 57 64 67 75
 75 77 88 90 91 93 94 94 96 97 97

Run time of HeapSort algorithm is 3.7e-05(s)
Enter size of input array: 1000
Run time of HeapSort algorithm is 0.000565(s)
Enter size of input array: 10000
Run time of HeapSort algorithm is 0.004968(s)
Enter size of input array: 100000
Run time of HeapSort algorithm is 0.066265(s)
```

Graphs:

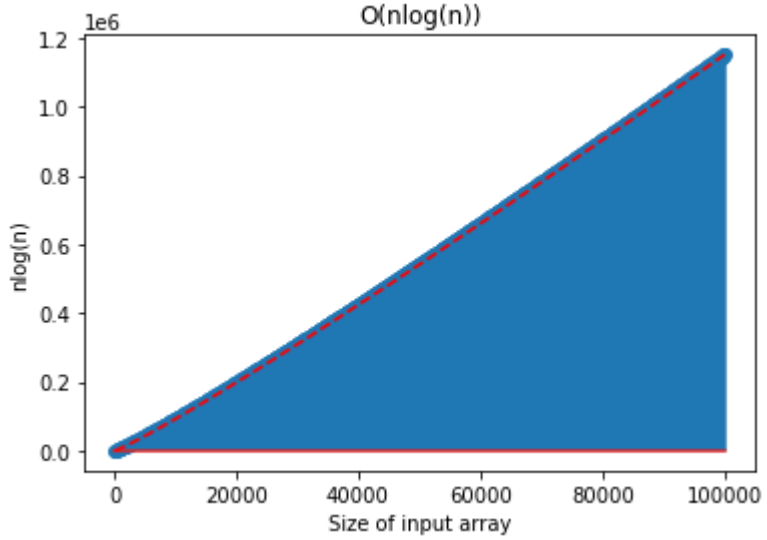
Test with different input sizes: [100:100000]



Another test with different sizes: [100:100000]



O(nlog(n)) complexity plot



As you can see, the run time of the HeapSort algorithm perfectly resembles the run time of O(nlog(n)) complexity graph.