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Intake: 21

Output from the console:

Case 01:

```
PS D:\CSE labs\CSE-labs> cd "d:\CSE labs\CSE-labs\Lab 08\" ; if ($?) { g++ heap.cpp -o heap } ; if ($?) { .\heap }  
8 6 1 5 7 11 55 65 124 78 -1  
Input array  
8 6 1 5 7 11 55 65 124 78  
Sorted array  
1 5 6 7 8 11 55 65 78 124
```

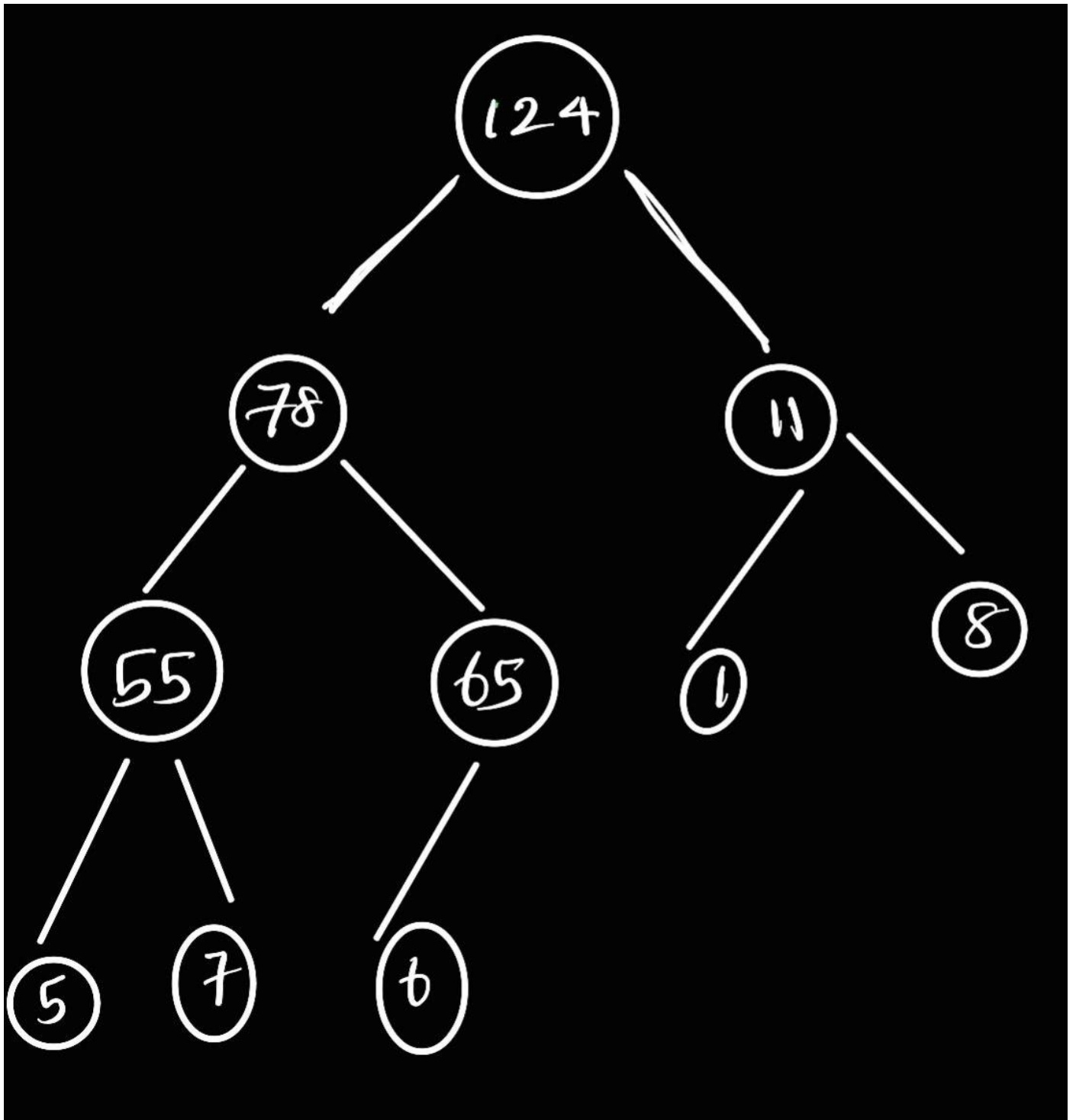
Case 02

```
PS D:\CSE labs\CSE-labs> cd "d:\CSE labs\CSE-labs\Lab 08\" ; if ($?) { g++ heap.cpp -o heap } ; if ($?) { .\heap }  
5 9 99 66 44 88 321 -1  
Input array  
5 9 99 66 44 88 321  
Sorted array  
5 9 44 66 88 99 321
```

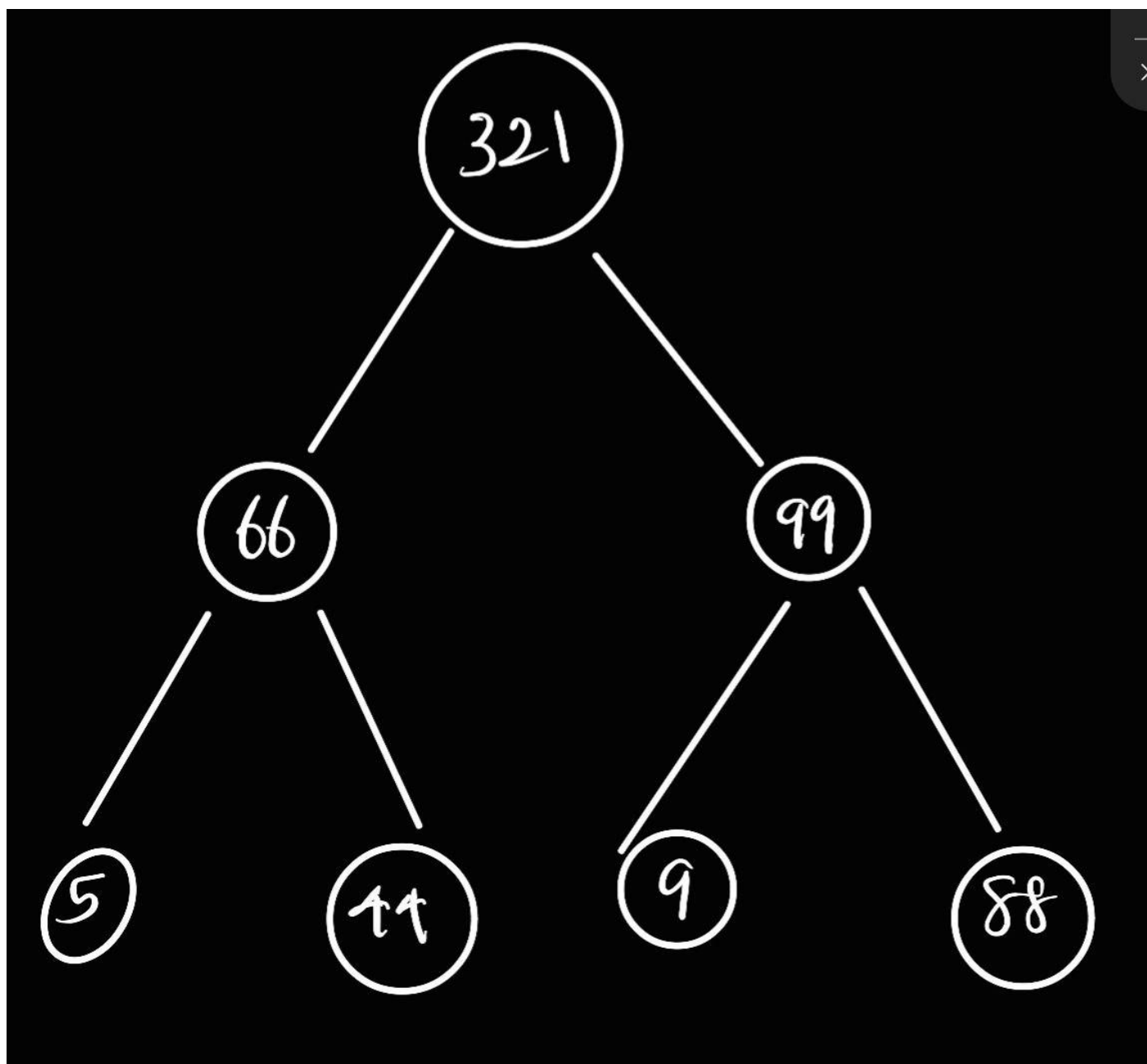
GitHub: <https://github.com/Thejas0604/CSE-labs>

Max Heaps for the input cases:

Case 01



Case 02:



Discussion:

- HeapSort consists of two main tasks.
 - Building the heap
 - Heapify
- To build the heap there will be a time of $O(n)$.
- Heapify consumes $O(\log n)$ time.
- Total Time Complexity: $O(n) + (n-1)*O(\log n)$
- Total Time Complexity: $O(n \log n)$

n = number of elements in the heap