Initially the array may not satisfy the heap property.
The heap will be built up by calling heapify on all internal nodes from the bottom up.
Heap size: 40
Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Running heapify on node 19 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Largest of node 19 and its children is node 19.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Running heapify on node 18 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Largest of node 18 and its children is node 18.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Running heapify on node 17 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Largest of node 17 and its children is node 36.
Root and max will be swapped and heapify will recurse on the new node 36.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509
Running heapify on node 36.
Heap size: 40 Array contents: ALGORITHMS-CAMBRISGE-2015-HEAPSORT-GD509
Largest of node 36 and its children is node 36.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMBRISGE-2015-HEAPSORT-GD509
Running heapify on node 16 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRISGE-2015-HEAPSORT-GD509
Largest of node 16 and its children is node 33.
Root and max will be swapped and heapify will recurse on the new node 33.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GD509
Running heapify on node 33.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509
Largest of node 33 and its children is node 33.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509
Running heapify on node 15 as part of the build heap (heap-up) process.

Heap size: 40 Array contents: ALGORITHMS-CAMBPG-2015-HEAPSORI-GD509
Largest of node 15 and its children is node 15.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509
Running heapify on node 14 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509
Largest of node 14 and its children is node 30.
Root and max will be swapped and heapify will recurse on the new node 30.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509
Running heapify on node 30.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509
Largest of node 30 and its children is node 30.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509

Largest of node 30 and its children is node 30.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509
Running heapify on node 13 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORLGDS09
Largest of node 13 and its children is node 13.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509
Running heapify on node 12 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTS-GE-2015-HEAPBORI-GD509

```
0: A
1: L
2: G
3: O
4: R
5: I
6: T
7: H
8: M
9: S
10: -
11: C
12: A
13: M
14: S
15: R
16: T
17: S
18: G
19: E
20: -
21: 2
22: 0
23: 1
24: 5
25: -
26: H
27: E
28: A
29: P
30: B
31: O
32: R
33: I
34: -
35: G
36: D
37: S
38: 0
39: 9
```

Running heapify on node 12 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTS-GE-2015-HEAPBORI-GD509
Largest of node 12 and its children is node 26.
Root and max will be swapped and heapify will recurse on the new node 26.
Heap size: 40 Array contents: ALGORITHMS-CAMSRT5SGE-2015-HEAPBORI-GD509
Running heapify on node 26.
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509
Largest of node 26 and its children is node 26.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509

Largest of node 26 and its children is node 26.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509
Running heapify on node 11 as part of the build heap (heap-up) process.

Heap size: 40
Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509
Largest of node 11 and its children is node 11.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMS-CHMRTSGE-2015-AEAPBORI-GD509
Running heapify on node 10 as part of the build heap (heap-up) process.

Heap size: 40
Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509
Largest of node 10 and its children is node 21. 
Root and max will be swapped and heapify will recurse on the new node 21. 
Heap size: 40 Array contents: ALGORITHMS-CHMSRT5GE-2015-AEAPB0RI-GD09
Running heapify on node 21
Heap size: 40 Array contents: ALGORITHMSCHMSRTSGE--015-AEAPBORI-GD509
Largest of node 21 and its children is node 21.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMSCHMSRTSGE--015-AEAPBORI-GD509
Running heapify on node 9 as part of the build heap (heap-up) process.

Heap size: 40
Array contents: ALGORITHMSCHRTSGE--015-AEAPBORI-GD509
Largest of node 9 and its children is node 9.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITHMSCHMSTSGE--015-AEAPBORI-GD509
Running heapify on node 8 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS2CHMSRTSGE--015-AEAPBORI-GD509
Largest of node 8 and its children is node 17.
Root and max will be swapped and heapify will recurse on the new node 17.
Heap size: 40 Array contents: ALGORITHMSCHMSRTSGE-015-AEAPBORI-GD509
Running heapify on node 17.
Heap size: 40 Array contents: ALGORITHSS2CHMSRTMGE--015-AEAPBORI-GD509
Largest of node 17 and its children is node 17.

No swap is necessary, heapify done.

Heap size: 40
Array contents: ALGORITHMS

Largest of node 17 and its children is node 17.

No swap is necessary, heapify done.

Heap size: 40
Array contents: ALGORITHMS
Running heapify on node 7 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHSS2CHMSRTMGE--015-AEAPBORI-GD509
Largest of node 7 and its children is node 16.
Root and max will be swapped and heapify will recurse on the new node 16.
Heap size: 40 Array contents: ALGORITHSS2CHMSRTMGE--015-AEAPBORI-GD509
Running heapify on node 16.
Heap size: 40 Array contents: ALGORITSS2CHMSRHMGE--015-AEAPBORI-GD509
Largest of node 16 and its children is node 33.

Root and max will be swapped and heapify will recurse on the new node 33.

Heap size: 40
Array contents: ALGORITSS2CHMSRHME--015-AEAPB0RI-GD509
Running heapify on node 33.
Heap size: 40 Array contents: ALGORITTSS2CHMSRIMGE--015-AEAPBORH-GD509
Largest of node 33 and its children is node 33.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITSS2CHMSRIMGEO15-AEAPBORH-GD509
Running heapify on node 6 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITTSSCHRSRIMGE-015-AEAPBORH-GD509
Largest of node 6 and its children is node 6.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITTSS2CHMSRIMG--015-AEAPBORH-GD509
Running heapify on node 5 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITTS2CHMSRIMG--015-AEAPBORH-GD509
Largest of node 5 and its children is node 5.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGORITSS2CHMSRIMGE--015-AEAPBORH-GD509
Running heapify on node 4 as part of the build heap (heap-up) process.

Heap size: 40 Array contents: ALGORITTSS2CHMSRIMG--015-AEAPBORH-GD509

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Diagram showing a binary heap structure with nodes labeled from 0 to 39.
Largest of node 4 and its children is node 9. 
Root and max will be swapped and heapify will recurse on the new node 9. 
Heap size: 40 Array contents: ALGORITTS2CHMSRIMG-E-015-AEAPB0RH-GD509
Running heapify on node 9.
Heap size: 40 Array contents: ALGOSITTSR2CHMSRIMGE--015-AEAPBORH-GD509
Largest of node 9 and its children is node 9.
No swap is necessary, heapify done.

Heap size: 40
Array contents: ALGOSITTSR2CHMSRIMGME--015-AEAPBORH-GD509

Largest of node 9 and its children is node 9.
No swap is necessary, heapify done.
Heap size: 40
Array contents: ALGOSITTSR2CHMSRIMGME--015-AEAPBORH-GD509
Running heapify on node 3 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGOSITTSR2CHMSRIMG---015-AEAPBORH-GD509
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node.
Heap size: 40
Array contents: ALGOSTTSR2CHMSRIMG-E015-APBORH-GD509

Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node.
Heap size: 40
Array contents: ALGOSTTSR2CHMSRIMG-E015-APBORH-GD509
Running heapify on node 7
Heap size: 40 Array contents: ALGTSITOSR2CHMSRIMGE--015-AEAPBORH-GD509
Largest of node 7 and its children is node 15. Root and max will be swapped and heapify will recurse on the new node 15.
Running heapify on node 15
Heap size: 40 Array contents: ALGTSITRSR2CHMSOIMGE--015-AEAPBORH-GD509
Largest of node 15 and its children is node 32.
Root and max will be swapped and heapify will recurse on the new node 32.
Heap size: 40 Array contents: ALGTSITRSR2CHMSOIMG-E015-AEAPBORHG09

Largest of node 15 and its children is node 32.
Root and max will be swapped and heapify will recurse on the new node 32.
Heap size: 40 Array contents: ALGTSITRSR2CHMSOIMG-E015-AEAPBORHG09
Running heapify on node 32.
Heap size: 40 Array contents: ALGTSITRSR2CHMSRIMGE--015-AEAPBOOH-GD509
Largest of node 32 and its children is node 32.
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALGTSITRSR2CHMSRIMG--015-AEAPBOOH-GD509
Running heapify on node 2 as part of the build heap (heap-up) process.

Heap size: 40 Array contents: ALGTSRSTRCHMSIRMGE--015-AEAPBOOH-GD509
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 40 Array contents: ALGTSITRSR2CHMSRIMGE--015-AEAPBOOH-GD509
Running heapify on node 6.
Heap size: 40 Array contents: ALTTSIGRSR2CHMSRIMGE--015-AEAPBOOH-GD509
Largest of node 6 and its children is node 14. Root and max will be swapped and heapify will recurse on the new node 14.
Heap size: 40 Array contents: ALTTSIGRSR2CHMSRIMGE--015-AEAPBOOH-GD509
Running heapify on node 14.
Heap size: 40 Array contents: ALTTSISRSR2CHMGRIMGE--015-AEAPBOOH-GD509
Largest of node 14 and its children is node 29.
Root and max will be swapped and heapify will recurse on the new node 29.
Heap size: 40 Array contents: ALTTSISRSR2CHMGRIMGE--015-AEAPBOOH-GD509
Running heapify on node 29.
Heap size: 40 Array contents: ALTTSISRSR2CHMPRIMGE--015-AEAGBOOH-GD509
Largest of node 29 and its children is node 29. 
No swap is necessary, heapify done.
Heap size: 40 Array contents: ALTTSISRSR2CHMPRIMGE--015-AEAGBOOH-GD509
Running heapify on node 1 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALTTISRS2CHMPRIMGGE--015-AEAGBOOH-GD509
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 40 Array contents: ALTTSISRSR2CHMPRIMGE--015-AEAGBOOH-GD509
Running heapify on node 3.
Heap size: 40 Array contents: ATTLSISRSR2CHMPRIMGE--015-AEAGBOOH-GD509
Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 40 Array contents: ATTLSISRSR2CHMPRIMGE--015-AEAGBOOH-GD509

Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 40 Array contents: ATTLSISRSR2CHMPRIMGE--015-AEAGBOOH-GD509
Running heapify on node 8.
Heap size: 40 Array contents: ATTSSISRLR2CHMPRIMGE--015-AEAGBOOH-GD509
Largest of node 8 and its children is node 17. Root and max will be swapped and heapify will recurse on the new node 17. Heap size: 40 Array contents: ATTSISRLL2CHMPRIMGE--015-AEAGBOOH-GD509
Running heapify on node 17.
Heap size: 40 Array contents: ATTSSISRMR2CHMPRILGE--015-AEAGBOOH-GD509
Largest of node 17 and its children is node 17.
No swap is necessary, heapify done.

Heap size: 40
Array contents: ATTSSISRMR2CHMPRILGE--015-AEAGBOOH-GD509
Running heapify on node 0 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ATTSSISRMR2CHMPRLGE--015-AEAGBOOH-GD509
Largest of node 0 and its children is node 1. Root and max will be swapped and heapify will recurse on the new node 1. Heap size: 40 Array contents: ATTSSISRMR2CHMPRILGE--015-AEAGBOOH-GD509
Running heapify on node 1.
Heap size: 40 Array contents: TATSSISRMCRIMPRLGE--015-AEAGBOOHR-GD509
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 40 Array contents: TATISSRMEMPRILGE--015-AEAGBOOH-GD509
Running heapify on node 3.
Heap size: 40
Array contents: TSTASISRMR2CHMPRILGE--015-AEAGBOOH-GD509
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 40 Array contents: TSTASISRMR2CHMPRILGE--015-AEAGBOOH-GD509

Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 40 Array contents: TSTASISRMR2CHMPRILGE--015-AEAGBOOH-GD509
Running heapify on node 7.
Heap size: 40
Array contents: TSTRSISAMR2CHMPRILGE--015-AEAGBOOH-GD509
Largest of node 7 and its children is node 15.
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 40 Array contents: TSTRSAMSIRCHMPLGE--015-AEAGBOOH-GD509
Running heapify on node 15.
Heap size: 40 Array contents: TSTRSISRMR2CHMPAILGE--015-AEAGBOOH-GD509
Largest of node 15 and its children is node 31.
Root and max will be swapped and heapify will recurse on the new node 31.
Heap size: 40 Array contents: TSTRSISRMR2CHMPAILGE--015-AEAGBOOH-GD509
Running heapify on node 31.
Heap size: 40 Array contents: TSTRSISRMR2CHMPOILGE--015-AEAGBAOH-GD509
Largest of node 31 and its children is node 31.
No swap is necessary, heapify done.
Heap size: 40 Array contents: TSTRSISRMR2CHMPOILGE-015-AEAGBAOH-GD509

Largest of node 31 and its children is node 31.
No swap is necessary, heapify done.
Heap size: 40 Array contents: TSTRSISRMR2CHMPOILGE-015-AEAGBAOH-GD509
The array now satisfies the heap property.

The heap will be emptied by repeatedly taking the root element
and moving it outside of the heap in the underlying array.

Heap size: 40 Array contents: TSTRISIRMCHIMPOLGE--015-AEABAOGH-GD509
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented.
Heap size: 40 Array contents: TSTRSISRMR2CHMPOILGE--015-AEAGBAOH-GD509
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 39
Array contents: 9STRSISRMR2CHMPOILGE--015-AEAGBAOH-GD50T
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 39 Array contents: 9STRSISRMR2CHMPOILGE--015-AEAGBAOH-GD50T
Running heapify on node 2.
Heap size: 39 Array contents: T S9R SISRM R2CHM P OIL GE--0 1 5 AEAG BA OH GD S 0
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 39 Array contents: TS9RSISRMR2CHMPOILGE-015-AEAGBAOH-GD50T
Running heapify on node 6.
Heap size: 39 Array contents: TSSRSI9RMR2CHMPOILGE--015-AEAGBAOH-GD50T
Largest of node 6 and its children is node 14.
Root and max will be swapped and heapify will recurse on the new node 14.
Heap size: 39 Array contents: TSSRSI9RMR2CHMPOILGE--015-AEAGBAOH-GD50T
Running heapify on node 14.
Heap size: 39 Array contents: TSSRSIPRMR2CHM9OILGE--015-AEAGBAOH-GD50T
Largest of node 14 and its children is node 29.
Root and max will be swapped and heapify will recurse on the new node 29.
Heap size: 39 Array contents: TSSRSIPRMR2CHM9OILGE--015-AEAGBAOH-GD50T
Running heapify on node 29.
Heap size: 39 Array contents: TSSRSIPRMR2CHMGOILGE--015-AEA9BAOH-GD50T
Largest of node 29 and its children is node 29.
No swap is necessary, heapify done.
Heap size: 39 Array contents: TSSRSIPRMR2CHMGOILGE--015-AEA9BAOH-GD50T
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 39 Array contents: TSSSPRMR2CHMGILGE--015-AEA9BAOH-DG50T
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 38 Array contents: 0SSRSIPRMR2CHMGOILGE--015-AEA9BAOH-GD5TT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 38 Array contents: 08RSRIPKRM2CHMG0ILGE--015-5EA9HA0H-GD5T
Running heapify on node 1.
Heap size: 38
Array contents: S0SRSIPRMR2CHMGOILGE--015-AEA9BAOH-GD5TT

0: S
1: 0
2: S
3: R
4: S
5: M
6: R
7: C
8: H
9: M
10: G
11: O
12: I
13: L
14: G
15: E
16: -
17: -
18: 0
19: 1
20: 5
21: -
22: -
23: A
24: E
25: A
26: 9
27: B
28: A
29: G
30: B
Largest of node 1 and its children is node 4.
Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 38 Array contents: S0SPRMR2CHMGOILGE--015-AEA9BAOH-GD5TT
Running heapify on node 4.
Heap size: 38 Array contents: SSSR0IPRMR2CHMGOILGE--015-AEA9BAOH-GD5TT
Largest of node 4 and its children is node 9. 
Root and max will be swapped and heapify will recurse on the new node 9.
Heap size: 38 Array contents: SSSR0PRMR2CHMG0ILGE--015-AEA9BAOH-GD5TT
Running heapify on node 9.
Heap size: 38 Array contents: SSSRRIPRM02CHMGOILGE--015-AEA9BAOH-GD5TT
Largest of node 9 and its children is node 19.
Root and max will be swapped and heapify will recurse on the new node 19.
Heap size: 38
Array contents: SSSRRPRM02CHMGOILGE--015-AEA9BAOH-GD5TT
Running heapify on node 19.
Heap size: 38 Array contents: SSSRRIPRME2CHMGOILG0--015-AEA9BAOH-GD5TT
Largest of node 19 and its children is node 19.
No swap is necessary, heapify done.
Heap size: 38 Array contents: SSSRRIPRME2CHMGOILG0--015-AEA9BAOH-GD5TT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 38 Array contents: SSSRRPRME2CHMGOILG0--015-AEA9BAOH-GD5TT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 37 Array contents: SSSRIPRME2CHMGOILG0--015-AEA9BAOH-GDSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.

Heap size: 37 Array contents: SSSRRPRME2CHMGOILG0--015-AEA9BAOH-GDSTT

Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 37 Array contents: SSSRRPRME2CHMGOILG0--015-AEA9BAOH-GDSTT
Running heapify on node 1.
Heap size: 37
Array contents: S5SRRIPRME2CHMGOILG0--015-AEA9BAOH-GDSTT
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 37 Array contents: SSSRRIPRME2CHMGOILG0--015-AEA9BAOH-GDSTT

Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 37 Array contents: SSSRRIPRME2CHMGOILG0--015-AEA9BAOH-GDSTT
Running heapify on node 3.
Heap size: 37 Array contents: SRS5RIPRME2CHMGOILG0--015-AEA9BAOH-GDSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.

Heap size: 37
Array contents: SRS5RIPRME2CHMGOILG0--015-AEA9BAOH-GDSTT
Running heapify on node 7.
Heap size: 37 Array contents: SRSRRIP5ME2CHMGOILG0--015-AEA9BAOH-GDSTT
Largest of node 7 and its children is node 15.
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 37 Array contents: SRSRRIP5ME2CHMGOILG0--015-AEA9BAOH-GDSTT
Running heapify on node 15.
Heap size: 37 Array contents: SRSRRIPOME2CHMG5ILG0-015-AEA9BAOH-GDSTT
Largest of node 15 and its children is node 32.
Root and max will be swapped and heapify will recurse on the new node 32.
Heap size: 37
Array contents: SRSRIPOME2CHMG5ILG0--015-AEA9BAOH-GDSTT
Running heapify on node 32.
Heap size: 37 Array contents: SRSRRIPOME2CHMGOILG0--015-AEA9BA5H-GDSTT
Largest of node 32 and its children is node 32.
No swap is necessary, heapify done.
Heap size: 37 Array contents: SRSRRIPOME2CHMGOILG0--015-AEA9BA5H-GDSTT

Largest of node 32 and its children is node 32.
No swap is necessary, heapify done.
Heap size: 37 Array contents: SRSRRIPOME2CHMGOILG0--015-AEA9BA5H-GDSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 37 Array contents: SRSRRPOME2CHMG0LGO-015-AEA9BASG-DGSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 36 Array contents: DRSRRIPOME2CHMGOILG0--015-AEA9BA5H-GSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.

Heap size: 36 Array contents: DRSRRPOME2CHMGOILG0--015-AEA9BA5H-GSSTT
Running heapify on node 2.
Heap size: 36 Array contents: SRDRRIPOME2CHMGOILG0--015-AEA9BA5H-GSSTT
Largest of node 2 and its children is node 6. 
Root and max will be swapped and heapify will recurse on the new node 6. 
Heap size: 36 Array contents: SRDRIPOME2CHMGOILG0--015-AEA9BA5H-GSSTT
Running heapify on node 6.
Heap size: 36
Array contents: SRPRRIDOME2CHMGOILG0--015-AEA9BA5H-GSSTT

Node 6: D
Node 5: C
Node 12: H
Node 11: C
Node 10: 2
Node 9: E
Node 8: M
Node 7: O
Node 3: R
Node 2: P
Node 1: R
Node 0: S
Largest of node 6 and its children is node 13.
Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 36 Array contents: SRPRIDOME2CHMGOILG0--015-AEA9BA5H-GSSTT

Largest of node 6 and its children is node 13.
Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 36 Array contents: SRPRIDOME2CHMGOILG0--015-AEA9BA5H-GSSTT
Running heapify on node 13.
Heap size: 36
Array contents: SRPRRIMOME2CHDGOILG0--015-AEA9BA5H-GSSTT
Largest of node 13 and its children is node 27.
Root and max will be swapped and heapify will recurse on the new node 27.
Heap size: 36
Array contents: SRPRIMOME2CHDGOILG0--015-AEA9BA5H-GSSTT

Largest of node 13 and its children is node 27.
Root and max will be swapped and heapify will recurse on the new node 27.
Heap size: 36
Array contents: SRPRIMOME2CHDGOILG0--015-AEA9BA5H-GSSTT
Running heapify on node 27.
Heap size: 36 Array contents: SRPRRIMOME2CHEGOILG0--015-ADA9BA5H-GSSTT
Largest of node 27 and its children is node 27.
No swap is necessary, heapify done.
Heap size: 36 Array contents: SRPRIMOME2CHEGOILG0--015-ADA9BA5H-GSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 36 Array contents: SRPRIMOME2CHEGOILG0--015-ADA9BA5H-GSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 35
Array contents: GRPRRIMOME2CHEGOILG0--015-ADA9BA5H-SSSTT
Largest of node 0 and its children is node 1. Root and max will be swapped and heapify will recurse on the new node 1.

Heap size: 35 Array contents: GRPRRIMOME2CHEGOILG0--015-ADA9BA5H-SSSTT
Running heapify on node 1.
Heap size: 35
Array contents: RGPRRIMOME2CHEGOILG0--015-ADA9BA5H-SSSTT

0: R
1: G
2: P
3: R
4: R
5: I
6: M
7: O
8: M
9: E
10: 2
11: C
12: H
13: E
14: G
15: O
16: I
17: L
18: G
19: O
20: -
21: -
22: 0
23: 1
24: 5
25: -
26: A
27: D
28: A
29: 9
30: B
31: A
32: S
33: H
34: -
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 35 Array contents: RGPRRIMOME2CHEGOILG0--015-ADA9BA5H-SSSTT
Running heapify on node 3.
Heap size: 35
Array contents: RRPGRIMOME2CHEGOILG0--015-ADA9BA5H-SSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.

Heap size: 35
Array contents: RRPGRIOMIECBEIOGLO0--015-ADA9BA5H-SSSTT

Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 35
Array contents: RRPGRIOMIECBEIOGLO0--015-ADA9BA5H-SSSTT
Running heapify on node 7.
Heap size: 35 Array contents: RRPORIMGME2CHEGOILG0--015-ADA9BA5H-SSSTT
Largest of node 7 and its children is node 15.
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 35 Array contents: RRPORIMGME2CHEGOILG0--015-ADA9BA5H-SSSTT
Running heapify on node 15.
Heap size: 35 Array contents: RRPORMOMI2CHEGGILG0--015-ADA9BA5H-SSSTT
Largest of node 15 and its children is node 15.
No swap is necessary, heapify done.
Heap size: 35 Array contents: RRPORIMOME2CHEGGILG0--015-ADA9BA5H-SSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 35 Array contents: RRPORIMOME2CHEGGILG0--015-ADA9BA5H-SSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 34 Array contents: -RPORIMOME2CHEGGILG0--015-ADA9BA5HRSSSTT
Largest of node 0 and its children is node 1. 
Root and max will be swapped and heapify will recurse on the new node 1. 
Heap size: 34 Array contents: 'KPORIMOC2CHEGGL00--015-ADA9BAHRSSTT'
Running heapify on node 1.
Heap size: 34 Array contents: R-PORIMOME2CHEGGILG0--015-ADA9BA5HRSSSTT
Largest of node 1 and its children is node 4.
Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 34 Array contents: R-PORIMOME2CHEGGILG0--015-ADA9BA5HRSSSTT
Running heapify on node 4.
Heap size: 34
Array contents: RRPO-IOME2CHEGGILG0--015-ADA9BA5HRSSSTT
Largest of node 4 and its children is node 9.

Root and max will be swapped and heapify will recurse on the new node 9.

Heap size: 34
Array contents: RRPO-IMOME2CHEGGILG0--015-ADA9BA5HRSSSTT
Running heapify on node 9.
Heap size: 34 Array contents: RRPOEMOM-2CHEGGILG0--015-ADA9BA5HRSSSTT
Largest of node 9 and its children is node 19.

Root and max will be swapped and heapify will recurse on the new node 19.

Heap size: 34
Array contents: RRPOEMOM-2CHEGGILG0--015-ADA9BA5HRSSSTT
Running heapify on node 19.
Heap size: 34 Array contents: RRPOEIMOM02CHEGGILG---015-ADA9BA5HRSSSTT
Largest of node 19 and its children is node 19.
No swap is necessary, heapify done.
Heap size: 34
Array contents: RRPOEIMOM02CHEGGILG---015-ADA9BA5HRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented.
Heap size: 34 Array contents: RRPOEIMOM02CHEGGILG015-ADA9BA5HRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.

Heap size: 33 Array contents: HRPOEMOMO2CHEGGILG---015-ADA9BA5RRSSSTT
Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.

Array contents: H R P O E I M O M 0 2 C H E G G I L G - - 0 1 5 - A D A 9 B A S R I S S S T T
Running heapify on node 1.
Heap size: 33 Array contents: RHPOEMOM02CHEGGILG---015-ADA9BA5RRSSSTT
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 33 Array contents: RHPOEIMOM02CHEGGILG---015-ADA9BA5RRSSSTT
Running heapify on node 3.
Heap size: 33 Array contents: ROPHEIMOM02CHEGGILG---015-ADA9BA5RRSSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 33 Array contents: ROPHEIMOM02CHEGGILG---015-ADA9BA5RRSSSTT
Running heapify on node 7.
Heap size: 33 Array contents: ROPOEIMHM02CHEGGILG---015-ADA9BA5RRSSSTT
Largest of node 7 and its children is node 16.
Root and max will be swapped and heapify will recurse on the new node 16.
Heap size: 33 Array contents: ROPOEMBM02CHEGGILG---015-ADA9BA5SSSTT

Largest of node 7 and its children is node 16.
Root and max will be swapped and heapify will recurse on the new node 16.
Heap size: 33 Array contents: ROPOEMBM02CHEGGILG---015-ADA9BA5SSSTT
Running heapify on node 16.  
Heap size: 33 Array contents: R0POEIMIM02CHEGGHLG---015-ADA9BA5RRSSSTT
Largest of node 16 and its children is node 16.
No swap is necessary, heapify done.
Heap size: 33 Array contents: ROPOEIMIM02CHEGGHLG---015-ADA9BA5RRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 33 Array contents: ROPOEMIDCHEGGLHAG015ADA9BA5R5SSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 32 Array contents: SOPOEMIMIMICHEGGHLG---015-ADA9BARRSSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 32 Array contents: SOPOEIM0IM02CHEGGHLG---015-ADA9BARRRSSSTT
Running heapify on node 2.
Heap size: 32 Array contents: PO5OEIMIM02CHEGGHLG---015-ADA9BARRRSSSTT
Largest of node 2 and its children is node 6. Root and max will be swapped and heapify will recurse on the new node 6. Heap size: 32 Array contents: PO5OEIMIM02CHEGGHLG---015-ADA9BARRRSSSTT
Running heapify on node 6.
Heap size: 32 Array contents: POMOEI5IM02CHEGGHLG---015-ADA9BARRRSSSTT
Largest of node 6 and its children is node 14.
Root and max will be swapped and heapify will recurse on the new node 14.

Heap size: 32
Array contents: POMOESIM2CHEGGLG—015-ADA9BARRSSSTT
Running heapify on node 14.
Heap size: 32 Array contents: POMOEIGIM02CHE5GHLG---015-ADA9BARRRSSSTT
Largest of node 14 and its children is node 30.
Root and max will be swapped and heapify will recurse on the new node 30.
Heap size: 32 Array contents: POMOEGIMO2CH5GHLG-015-ADA9BARR358STT
Running heapify on node 30.
Heap size: 32 Array contents: POMOEIGIM02CHEBGHLG---015-ADA95ARRRSSSTT
Largest of node 30 and its children is node 30.
No swap is necessary, heapify done.
Heap size: 32 Array contents: POMOEIGIM02CHEBGHLG---015-ADA95ARRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented. Heap size: 32 Array contents: POMOEIGMOCEHBGLG015ADA95ARRSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.

Heap size: 31 Array contents: AOMOEIGIM02CHEBGHLG---015-ADA95PRRRSSSTT
Largest of node 0 and its children is node 1. 
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 31 Array contents: AOMOEIGIM02CHEBGHLG---015-ADA95PRRRSSSTT
Running heapify on node 1.
Heap size: 31 Array contents: OAMOEIGIM02CHEBGHLG---015-ADA95PRRRSSSTT
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.

Heap size: 31 Array contents: OAMOEIGIM02CHEBGHLG---015-ADA95PRRRSSSTT
Running heapify on node 3.
Heap size: 31 Array contents: OOMAEIGIM02CHEBGHLG---015-ADA95PRRRSSSTT
Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.

Heap size: 31 Array contents: OOMAEIG02CHEBGHLG--015-ADA95PRRSSSTT
Running heapify on node 8.
Heap size: 31 Array contents: OOMM{EIGIA}/0CHERGHELG—015-ADA95PRRRSSSTT
Largest of node 8 and its children is node 17.
Root and max will be swapped and heapify will recurse on the new node 17.
Heap size: 31 Array contents: OOMMEIGIA02CHEBGHLG---015-ADA95PRRRSSSTT
Running heapify on node 17.
Heap size: 31 Array contents: OOMMEIGIL02CHEBGHAG---015-ADA95PRRRSSSTT
Largest of node 17 and its children is node 17.
No swap is necessary, heapify done.
Heap size: 31 Array contents: OOMMEIGIL02CHEBGHAG---015-ADA95PRRRSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 31 Array contents: OOMMÈIGIL02CHEBGHAG---015-ADA95PRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 30 Array contents: SOMMÈGHIOCHEHAGI--015-ADA9OPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 30 Array contents: SOMMERGIL02CHEBGHAG--015-ADA9OPRRRSSSTT
Running heapify on node 1.
Heap size: 30 Array contents: O5MMEIGIL02CHEBGHAG---015-ADA9OPRRRSSSTT
0: O
1: 5
2: M
3: M
4: E
5: I
6: G
7: I
8: L
9: 0
10: 2
11: C
12: H
13: E
14: B
15: G
16: H
17: A
18: G
19: -
20: -
21: -
22: 0
23: 1
24: 5
25: -
26: A
27: D
28: A
29: 9
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 30 Array contents: O5MMEIGIL02CHEBGHAG---015-ADA9OPRRRSSSTT
Running heapify on node 3.
Heap size: 30 Array contents: OMM5EIGIL02CHEBGHAG---015-ADA9OPRRRSSSTT
Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.

Heap size: 30
Array contents: OMM5EIGIL02CHEBGHAG---015ADA9OPRRRSSSTT
Running heapify on node 8.
Heap size: 30 Array contents: OMMLEIGI502CHEBGHAG---015-ADA9OPRRSSSTT
Largest of node 8 and its children is node 18.
Root and max will be swapped and heapify will recurse on the new node 18.

Heap size: 30 Array contents: OMMLEIG02CHEBGHAG---015-ADA9OPRRRSSSTT
Running heapify on node 18.
Heap size: 30 Array contents: OMMLEIGIG02CHEBGHA5---015-ADA9OPRRRSSSTT

Running heapify on node 18.
Heap size: 30 Array contents: OMMLEIGIG02CHEBGHA5---015-ADA9OPRRRSSSTT
Largest of node 18 and its children is node 18.
No swap is necessary, heapify done.

Heap size: 30 Array contents: OMMLEIGIG02CHEBGHA5---015-ADA9OPRRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented. 

Heap size: 30 Array contents: OMMLEIG02CHEBGHA5-015-ADA90PRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.

Heap size: 29
Array contents: 9MMLEIGIG02CHEBGHA5---015-ADAOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 29
Array contents: 9MMLEIGIG02CHEBGHA5---015-ADAOOPRRRSSTTT
Running heapify on node 1.
Heap size: 29 Array contents: M9MLEIGIG02CHEBGHA5---015-ADAOOPRRRSSSTT
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 29 Array contents: M9MLEIGIG02CHEBGHA5---015-ADAOOPRRRSSSTT

Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 29 Array contents: M9MLEIGIG02CHEBGHA5---015-ADAOOPRRRSSSTT
Running heapify on node 3.
Heap size: 29 Array contents: MLM9EIGIG02CHEBGHA5---015-ADAOOPRRRSSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 29
Array contents: MLM9IGIGICHEBGHA5--015-ADAOOPRRSSSTT
Running heapify on node 7.
Heap size: 29 Array contents: MLMIEIG9G02CHEBGHA5---015-ADAOOPRRRSSSTT
Largest of node 7 and its children is node 16.

Root and max will be swapped and heapify will recurse on the new node 16.

Heap size: 29
Array contents: MLMIEIG9G02CHEBGHA5015ADOOPRSSSTT
Running heapify on node 16.
Heap size: 29 Array contents: MLMIEIGHG02CHEBG9A5---015-ADAOOPRRRSSSTT
Largest of node 16 and its children is node 16.
No swap is necessary, heapify done.
Heap size: 29 Array contents: MLMIEIGHG02CHEBG9A5---015-ADAOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 29 Array contents: MLMIEIGHG02CHEBG9A5---015-ADAOOPRRRSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 28 Array contents: ALMIEIGHG02CHEBG9A5---015-ADMOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 28 Array contents: ALMIEIGHG02CHEBG9A5---015-ADMOOPRRSSSTT
Running heapify on node 2.
Heap size: 28 Array contents: MLAIEIGHG02CHEBG9A5---015-ADMOOPRRRSSSTT
Largest of node 2 and its children is node 5. Root and max will be swapped and heapify will recurse on the new node 5.

Heap size: 28 Array contents: MLAIEIGHG02CHEBG9A5--015-ADMOPRRRSSSTT
Running heapify on node 5.
Heap size: 28 Array contents: MIJHEAGH60CHE869AS5—015-ADMOOPRRRSSSTT
Largest of node 5 and its children is node 12.
Root and max will be swapped and heapify will recurse on the new node 12.
Heap size: 28 Array contents: MLIEAGH02CHEBG9A5–015–ADMOOPRRR5SSSTT
Running heapify on node 12.
Heap size: 28 Array contents: MLIEHGHG02CAEBG9A5---015-ADMOOPRRRSSSTT

0: M
1: L
2: I
3: I
4: E
5: H
6: G
7: H
8: G
9: 0
10: 2
11: C
12: A
13: E
14: B
15: G
16: 9
17: A
18: 5
19: -
20: -
21: -
22: 0
23: 1
24: 5
25: -
26: A
27: D
Largest of node 12 and its children is node 12.
No swap is necessary, heapify done.
Heap size: 28 Array contents: MLIEHGHG02CAEBG9A5-015-ADMOOPRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented.
Heap size: 28 Array contents: MLIIEHGHG02CAEBG9A5--015-ADMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.

Heap size: 27
Array contents: DLIIEHGHG02CAEBG9A5---015-AMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 27 Array contents: DLIIEHGHG02CAEBG9A5---015-AMMOOPRRSSSTT
Running heapify on node 1.
Heap size: 27 Array contents: LDIIEHGHG02CAEBG9A5---015-AMMOOPRRRSSSTT

Diagram of the heap structure.
Largest of node 1 and its children is node 3. Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 27 Array contents: LDHEHGHG02CAEBG9A5–015-AMMOOPRRRSSSTT
Running heapify on node 3.
Heap size: 27 Array contents: LIIDEHGHG02CAEBG9A5--015-AMMOOPRRRSSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 27 Array contents: LIIDEHGHG02CAEBG9A5--015-AMMOOPRRSSSTT
Running heapify on node 7.

Heap size: 27

Array contents: LIIHEHGDG02CAEBG9A5---015-AMMOOPRRRSSSTT

0: L
1: I 2: I
3: H ... G
7: D 8: G 9: 0 10: 2 11: C 12: A 13: E 14: B
Largest of node 7 and its children is node 15.
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 27
Array contents: LIIHEHGDG02CAEBG9A5---015-AMMOOPRRRSSSTT
Running heapify on node 15.
Heap size: 27 Array contents: LIIHEHGGG02CAEBD9A5---015-AMMOOPRRRSSSTT
Largest of node 15 and its children is node 15.
No swap is necessary, heapify done.
Heap size: 27
Array contents: LIIHEHGGG02CAEBD9A5---015-AMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.

Heap size: 27 Array contents: L1H3E9G02C5AEB9A5---015-AMMOOPRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 26 Array contents: ABIEHGGGCAEBD9A5---015-LMMOOPRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 26
Array contents: AIBHEHGGGG0CAEBD9A5---015-LMMOPRRRSSSTT
Running heapify on node 1
Heap size: 26 Array contents: IAIHEHGGG02CAEBD9A5---015-LMMOOPRRRSSSTT
Largest of node 1 and its children is node 3. Root and max will be swapped and heapify will recurse on the new node 3. 

Heap size: 26

Array contents: IAEHEGG02CAEBD9A5-015-LMMOOPRRRSSSTT
Running heapify on node 3.
Heap size: 26 Array contents: BHAEHGGGCABO94A5—015-LMMOOPRRRSSTT
0: I
1: H
2: I
3: A
4: E
5: H
6: G
7: G
8: G
9: 0
10: 2
11: C
12: A
13: E
14: B
15: D
16: 9
17: A
18: 5
19: -
20: -
21: -
22: 0
23: 1
24: 5
25: -
Largest of node 3 and its children is node 7. Root and max will be swapped and heapify will recurse on the new node 7. Heap size: 26 Array contents: IHIAEHGG02CAEBD9A5---015-LMMOOPRRRSSSTT
Running heapify on node 7.

Heap size: 26 Array contents: IHIGEHGAG02CAEBD9A5---015-LMMOOPRRRSSSTT

0: I
1: H
2: I
3: G
4: E
5: H
6: G
7: A
8: G
9: 0
10: 2
11: C
12: A
13: E
14: B
15: D
16: 9
17: A
18: 5
19: -
20: -
21: -
22: 0
23: 1
24: 5
25: -
Largest of node 7 and its children is node 15.
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 26 Array contents: BHOIGAG02CAEBD9A5—015LMMOPRRRSSSTT
Running heapify on node 15.
Heap size: 26 Array contents: IHIGEHGDG02CAEBA9A5---015-LMMOOPRRRSSSTT

Running heapify on node 15.
Heap size: 26 Array contents: IHIGEHGDG02CAEBA9A5---015-LMMOOPRRRSSSTT
Largest of node 15 and its children is node 15.
No swap is necessary, heapify done.

Heap size: 26
Array contents: BHGEHGDG02/AEBA9A5--015-LMMOOPRRSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 26
Array contents: BHIGEHGDG02CAEA9A5---015-LMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 25 Array contents: HIGEHGDG02CAEBA9A5---015ILMMOOPRSSTTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 25 Array contents: -HIGEHGDG02CAEBA9A5---015ILMMOOPRRSSSTT
Running heapify on node 2.
Heap size: 25 Array contents: IH-GEHGDG02CAEBA9A5---015ILMMOOPRRRSSSTT

0: I
1: H
2: -
3: G
4: E
5: H
6: G
7: D
8: G
9: 0
10: 2
11: C
12: A
13: E
14: B
15: A
16: 9
17: A
18: 5
19: -
20: -
21: -
22: 0
23: 1
24: 5
Largest of node 2 and its children is node 5. Root and max will be swapped and heapify will recurse on the new node 5. Heap size: 25 Array contents: I H G E D G 0 2 C A E B A 9 A 5 - - - - - - - - - 0 1 5 I L M O O P R R S S S T T
Running heapify on node 5.
Heap size: 25
Array contents: IHHGE-GDG02CAEBA9A5---015ILMMOOPRRRSSSTT
0: I
1: H
2: H
3: G
4: E
5: -
6: G
7: D
8: G
9: 0
10: 2
11: C
12: A
13: E
14: B
15: A
16: 9
17: A
18: 5
19: -
20: -
21: -
22: 0
23: I
24: 5
Largest of node 5 and its children is node 11.
Root and max will be swapped and heapify will recurse on the new node 11.
Heap size: 25 Array contents: IHHGE-GDG02CAEBA9A5---015ILMMOOPRRRSSSTT
Running heapify on node 11.
Heap size: 25 Array contents: IHHGECGDG02-AEBA9A5---015ILMMOOPRRRSSSTT
0: I
1: H 2: H
3: G 4: E 5: C 6: G
7: D 8: G 9: 0 10: 2 11: - 12: A 13: E 14: B
Largest of node 11 and its children is node 24.
Root and max will be swapped and heapify will recurse on the new node 24.
Heap size: 25
Array contents: IHHGECGDG02-AEBA9A5---015ILMMOOPRRRSSSTT

Largest of node 11 and its children is node 24.
Root and max will be swapped and heapify will recurse on the new node 24.
Heap size: 25
Array contents: IHHGECGDG02-AEBA9A5---015ILMMOOPRRRSSSTT
Running heapify on node 24.
Heap size: 25 Array contents: IHHGECGDG025AEBA9A5---01-ILMMOOPRRRSSSTT
Largest of node 24 and its children is node 24.
No swap is necessary, heapify done.
Heap size: 25 Array contents: IHHGECGDG025AEBA9A5---01-ILMMOOPRRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented. Heap size: 25 Array contents: IHHGECGDG025AEBA9A5---01-ILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 24
Array contents: HEGDGDG025AEBA9A5---01IILMMOPRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.

Heap size: 24
Array contents: -HHGECGDG025AEBA9A5---01IILMMOPRRRSSSTT
Running heapify on node 1.

Heap size: 24

Array contents: H-HGECGDG025AEBA9A5---01IILMMOOPRRRSSSTT

0: H
1: -
2: H
3: G
4: E
5: C
6: G
7: D
8: G
9: 0
10: 2
11: 5
12: A
13: E
14: B
15: A
16: 9
17: A
18: 5
19: -
20: -
21: -
22: 0
23: 1
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 24 Array contents: H-HCGDG025AEBA9A5---01ILMOOPRRSSSTT
Running heapify on node 3.
Heap size: 24 Array contents: HGH-ECGDG025AEBA9A5---01IILMMOOPRRRSSSTT
Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 24 Array contents: HGH-ECGDG025AEBA9A5---01IILMMOOPRRRSSSTT
Running heapify on node 8.
Heap size: 24 Array contents: HGHGECGD-025AEBA9A5---01IILMMOOPRRRSSSTT

Running heapify on node 8.
Largest of node 8 and its children is node 17.
Root and max will be swapped and heapify will recurse on the new node 17.
Heap size: 24 Array contents: HGHGECGD-025AEBA9A5---01IILMMOOPRSSSTT
Running heapify on node 17.
Heap size: 24 Array contents: HGHGECGDA025AEBA9-5---01IILMMOOPRRRSSSTT
Largest of node 17 and its children is node 17.
No swap is necessary, heapify done.

Heap size: 24 Array contents: HGHGECGDA025AEBA9-5---01IILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 24 Array contents: HGHGECGDA025AEBA9-5---01IILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 23 Array contents: 1GHGECGDA025AEBA9-5---0HIILMMOOPRSSSTT
Largest of node 0 and its children is node 2. Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 23 Array contents: 1GHGECGDA025AEBA9-5---0HIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 23 Array contents: HG1GECGDA025AEBA9-5---0HIILMMOOPRRRSSSTT
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 23 Array contents: HG1GECGDA025AEBA9-5---0HIILMMOOPRRRSSSTT
Running heapify on node 6.
Heap size: 23 Array contents: HGGGEC1DA025AEBA9-5---0HIILMMOOPRRRSSSTT
Largest of node 6 and its children is node 13.
Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 23 Array contents: HGGEC1DA025AEBA9-5---0HIILMMOOPRRRSSSTT
Running heapify on node 13.
Heap size: 23 Array contents: HGGGECEDA025A1BA9-5---0HIILMMOOPRRRSSSTT
0: H
1: G 2: G
3: G 4: E 5: C 6: E
7: D 8: A
9: 0 10: 2 11: 5 12: A 13: 1
14: B 15: A 16: 9
Largest of node 13 and its children is node 13.
No swap is necessary, heapify done.
Heap size: 23 Array contents: HGGGECCEDA025A1BA9-5---0HIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 23 Array contents: HGGECEDA025A1BA9-5---0HIILMMOO8SSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 22 Array contents: 0GGGECEDA025A1BA9-5---HHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.

Heap size: 22
Array contents: 0GGIECEAO25A1BA9-5---HHILMOOPRRSSTT
Running heapify on node 1.
Heap size: 22 Array contents: G0GGECEDA025A1BA9-5---HHIILMMOOPRRRSSSTT
Largest of node 1 and its children is node 3. Root and max will be swapped and heapify will recurse on the new node 3. Heap size: 22 Array contents: G0GECEDA025A1BA9-5---HHIILMMOOPRRRSSSTT
Running heapify on node 3.
Heap size: 22 Array contents: GGG0ECEDA025A1BA9-5--HHIILMMOOPRRRSSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 22 Array contents: GGG0ECEDA025A1BA9-5---HHIILMMOOPRRRSSSTT
Running heapify on node 7.
Heap size: 22
Array contents: GGGDCE0A025A1BA9-5---HHIILMMOOPRRRSSSTT

Diagram of the heap with node 7 highlighted and values assigned to the nodes.
Largest of node 7 and its children is node 15. Root and max will be swapped and heapify will recurse on the new node 15.

Heap size: 22 Array contents: GGGDECE0A025A1BA9-5---HHIILMMOOPRRRSSSTT
Running heapify on node 15.
Heap size: 22 Array contents: GGGDECEAA025A1B09-5---HHIILMMOOPRRRSSSTT
Largest of node 15 and its children is node 15.
No swap is necessary, heapify done.
Heap size: 22 Array contents: GGGDECEAA025A1B09-5---HHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 22 Array contents: GGGDECEAA025A1B09-5---HHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 21 Array contents: 4GGDECEAA025A1B09-5-GHHIILMMOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 21 Array contents: -GGDECEAA025A1B09-5--GHHIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 21 Array contents: G-GDCEA025A1B09-5--GHHIILMMOOPRRRSSSTT
Largest of node 1 and its children is node 4.
Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 21 Array contents: G-GDECCEA025A1B09-5--GHHIILMOOPRRRSSSTT
Running heapify on node 4.
Heap size: 21 Array contents: GEGD-CEAA025A1B09-5--GHHIILMMOOPRRRSSSTT
Largest of node 4 and its children is node 10.
Root and max will be swapped and heapify will recurse on the new node 10.
Heap size: 21 Array contents: GEGD-CEAA025A1B09-5--GHHIILMMOOPRRRSSSTT
Running heapify on node 10
Heap size: 21 Array contents: GEGD2CEA0-5A1B09-5--GHHIILMMOOPRRRSSSTT
Largest of node 10 and its children is node 10.
No swap is necessary, heapify done.
Heap size: 21 Array contents: GEGD2CEAA0-5A1B09-5--GHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 21 Array contents: GEGD2CEAA0-5A1B09-5--GHHIILMMOOPRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 20 Array contents: -EGD2CEAA0-5A1B09-5-GGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.

Heap size: 20

Array contents: EGD2CEAA0A1B09-5GGHBILMMOPRRSSSTT
Running heapify on node 2.
Heap size: 20
Array contents: GE-D2CEAA0-5A1B09-5-GGHHIILMMOOPRRRSSSTT
0: G
1: E
2: -
3: D
4: 2
5: C
6: E
7: A
8: A
9: 0
10: -
11: 5
12: A
13: 1
14: B
15: 0
16: 9
17: -
18: 5
19: -
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 20
Array contents: GE-D2CEAA0-5A1B09-5-GGHHIILMMOOPRRRSSSTT
Running heapify on node 6.
Heap size: 20 Array contents: GEED2C-AA0-5A1B09-5-GGHHIILMMOOPRRRSSSTT

0: G
1: E
2: E
3: D
4: 2
5: C
6: -
7: A
8: A
9: 0
10: -
11: 5
12: A
13: 1
14: B

15: 0
16: 9
17: -
18: 5
19: -
Largest of node 6 and its children is node 14.
Root and max will be swapped and heapify will recurse on the new node 14.
Heap size: 20 Array contents: GEEID2C-AA0-5A1B09-5-GGHHIILMMOOPRRRSSSTT
Running heapify on node 14.
Heap size: 20 Array contents: GEED2CBAA0-5A1-09-5-GGHHIILMMOOPRRRSSSTT
Largest of node 14 and its children is node 14.
No swap is necessary, heapify done.
Heap size: 20 Array contents: GEED2CBA0-5A1-09-5-GGHIIILMMOOPRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 20
Array contents: GEEDCBAA0-5A1-09-5-GGHHILMOPRRRSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 19 Array contents: -EED2CBAA0-5A1-09-5GGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.

Heap size: 19

Array contents: -EED2CBAA0-5A1-09-5GGHIIILMMOOPRRRSSSTT

- 1: E
- 2: E
- 3: D
- 4: 2
- 5: C
- 6: B
- 7: A
- 8: A
- 9: 0
- 10: -
- 11: 5
- 12: A
- 13: -
- 14: -
- 15: 0
- 16: 9
- 17: -
- 18: 5
Running heapify on node 1.
Heap size: 19 Array contents: E-ED2CBA0-A1-09-SGGHHIILMMOOPRRRSSSTT
Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.

Heap size: 19 Array contents: E-ED2CBAA0-5A1-09-5GGGHHIILMMOOPRRRSSSTT
Running heapify on node 3.
Heap size: 19 Array contents: EDE-2CBAA0-5A1-09-5GGGHHIILMMOOPRRRSSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 19 Array contents: EDE-2CBAA0-5A1-09-5GGGHHILMMOOPRRRSSSTT
Running heapify on node 7.
Heap size: 19 Array contents: EDEA2CB-A0-5A1-09-5GGGHHIILMMOOPRRRSSSTT
Largest of node 7 and its children is node 16. Root and max will be swapped and heapify will recurse on the new node 16.

Heap size: 19
Array contents: EDEA2CB-A0-5A1-09-5GGGHHILMMOOPRRSSSTT
Running heapify on node 16.
Heap size: 19 Array contents: EDEA2CB9A0-5A1-0--5GGGHHIILMMOOPRRRSSSTT

0: E
1: D
2: E
3: A
4: 2
5: C
6: B
7: 9
8: A
9: 0
10: -
11: 5
12: A
13: 1
14: -
15: 0
16: -
17: -
18: 5
Largest of node 16 and its children is node 16.
No swap is necessary, heapify done.
Heap size: 19 Array contents: EDEA2CB9A0-5A1-0--5GGGHHILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 19 Array contents: EDEA2CB9A0-5A1-0--5GGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.

Heap size: 18 Array contents: 5DEA2CB9A0-5A1-0--EGGGHHIILMMOOPRRRSSSTT

0: 5
1: D 2: E
3: A 4: 2 5: C 6: B
7: 9 8: A 9: 0 10: - 11: 5 12: A 13: 1 14: -
15: 0 16: - 17: -
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 18 Array contents: 5DEA2CB9A0-5A1-0--EGGGHHIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 18 Array contents: ED5A2CB9A0-5A1-0--EGGGHHIILMMOOPRRRSSSTT
0: E
1: D
2: 5
3: A
4: 2
5: C
6: B
7: 9
8: A
9: 0
10: -
11: 5
12: A
13: 1
14: -
Largest of node 2 and its children is node 5.
Root and max will be swapped and heapify will recurse on the new node 5.
Heap size: 18 Array contents: ED5A2CB9A0-5A1-0--EGGGHHIILMMOOPRRRSSSTT
Running heapify on node 5.
Heap size: 18 Array contents: EDC25B9A0-5A1-0--EGGGHHIILMMOOPRRRSSSTT
Largest of node 5 and its children is node 12.
Root and max will be swapped and heapify will recurse on the new node 12.
Running heapify on node 12.
Heap size: 18 Array contents: EDCA2AB9A0-551-0--EGGGHHIILMMOOPRRRSSSTT

- 0: E
- 1: D 2: C
- 3: A 4: 2 5: A 6: B
- 7: 9 8: A 9: 0 10: - 11: 5 12: 5 13: 1 14: - 15: 0 16: - 17: -
Largest of node 12 and its children is node 12.
No swap is necessary, heapify done.
Heap size: 18 Array contents: EDCA2AB9A0-551-0--EGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 18 Array contents: EDCA2AB9A0-551-0--EGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 17 Array contents: -DCA2AB9A0-551-0-EEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 17 Array contents: -DCA2AB9A0-551-0-EEGGHIIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 17 Array contents: D-CA2AB9A0-551-0-EEGGGHHIILMMOOPRRRSSSTT

0: D
1: - 2: C
3: A 4: 2 5: A 6: B
7: 9 8: A 9: 0 10: - 11: 5 12: 5 13: 1 14: -
15: 0 16: -
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 17 Array contents: D-CA2AB9A0-551-0-EEGGHILMMOOPRRRSSSTT
Running heapify on node 3.
Heap size: 17 Array contents: DAC-2AB9A0-551-0-EEGGGHHIILMMOOPRRRSSSTT
0: D
1: A 2: C
3: - 4: 2 5: A 6: B
7: 9 8: A 9: 0 10: - 11: 5 12: 5 13: 1 14: - 15: 0 16: -
Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 17 Array contents: DAC-2AB9A0-551-0-EEGGHILMMOOPRFRSSSSTT
Running heapify on node 8
Heap size: 17 Array contents: DACA2AB9-0-551-0-EEGGGHHIILMMOOPRRRSSSTT
Largest of node 8 and its children is node 8.
No swap is necessary, heapify done.

Heap size: 17
Array contents: DACA2AB9-0-551-0-EEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented. Heap size: 17 Array contents: DACA2AB9-0-551-0-EEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 16 Array contents: -ACA2AB9-0-551-0DEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 16 Array contents: -ACA2AB9-0-551-0DEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 16 Array contents: CA-A2AB9-0-551-0DEEGGGHHIILMMOOPRRRSSSTT
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 16 Array contents: CA-A2AB9-0-551-0DEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 6.
Heap size: 16 Array contents: CABA2A-9-0-551-0DEEGGGHHIILMMOOPRRRSSSTT
Largest of node 6 and its children is node 13.
Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 16
Array contents: CABABA9-0-551-0DEEGGHHILMMOOPRRRSSSTT
Running heapify on node 13.
Heap size: 16 Array contents: CABA2A19-0-55--0DEEGGGHHIILMMOOPRRRSSSTT

1: C
2: A
3: A
4: 2
5: A
6: 1
7: 9
8: -
9: 0
10: -
11: 5
12: 5
13: -
14: -
15: 0
Largest of node 13 and its children is node 13.
No swap is necessary, heapify done.
Heap size: 16 Array contents: CABA2A19-0-55--0DEEGGGHHIILMMOOPRRRSSSTT

Largest of node 13 and its children is node 13.
No swap is necessary, heapify done.
Heap size: 16 Array contents: CABA2A19-0-55--0DEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented. 

Heap size: 16 Array contents: CABABA9.0-55--0DEEGGHILMOPRERRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 15 Array contents: 0ABA2A19-0-55--CDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.

Heap size: 15 Array contents: ABA2A19-0-55--CDEEGGGHHIILMOOPRSSSTT
Running heapify on node 2.
Heap size: 15 Array contents: BA0A2A19-0-55--CDEEGGHHIIIMMOOPRRTSSSTT

0: B
1: A
2: 0
3: A
4: 2
5: A
6: 1
7: 9
8: -
9: 0
10: -
11: 5
12: 5
13: -
14: -
Largest of node 2 and its children is node 5.
Root and max will be swapped and heapify will recurse on the new node 5.
Heap size: 15 Array contents: BA0A2A19-0-55--CDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 5.
Heap size: 15 Array contents: BAAA2019-0-55--CDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 5 and its children is node 11.
Root and max will be swapped and heapify will recurse on the new node 11.
Heap size: 15
Array contents: BAAA2019-0-55--CDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 11.
Heap size: 15 Array contents: BAAAA2519-0-05--CDEEGGGHHIILMMOOPRRRSSSSTT
Largest of node 11 and its children is node 11.
No swap is necessary, heapify done.
Heap size: 15 Array contents: BAAA2519-0-05--CDEEGGGHHIILMMOOPRRRSSSTT

Largest of node 11 and its children is node 11.
No swap is necessary, heapify done.
Heap size: 15 Array contents: BAAA2519-0-05--CDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 15 Array contents: BAAA2519-0-05--CDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 14 Array contents: -AAA2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 14
Array contents: -AAA2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 14 Array contents: A-AA2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 14 Array contents: A-AA2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
0: A
1: -
2: A
3: A
4: 2
5: 5
6: 1
7: 9
8: -
9: 0
10: -
11: 0
12: 5
13: -
Running heapify on node 3.
Heap size: 14 Array contents: AAA-2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 14 Array contents: AAA-2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT

Largest of node 3 and its children is node 7.
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 14 Array contents: AAA-2519-0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 7.
Heap size: 14 Array contents: AAA9251--0-05-BCDEGGHIIILMMOOPRRRSSSTT
Largest of node 7 and its children is node 7.
No swap is necessary, heapify done.
Heap size: 14 Array contents: AAA9251--0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 14 Array contents: AAA9251--0-05-BCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 13 Array contents: -AA9251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1. 
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 13 Array contents: -AA9251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 13 Array contents: A-A9251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 1 and its children is node 3.
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 13 Array contents: A-A9251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
0: A
1: -
2: A
3: 9
4: 2
5: 5
6: 1
7: -
8: -
9: 0
10: -
11: 0
12: 5
Running heapify on node 3.
Heap size: 13 Array contents: A9A-251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 3 and its children is node 3.
No swap is necessary, heapify done.
Heap size: 13 Array contents: A9A-251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
0: A
1: 9 2: A
3: - 4: 2 5: 5 6: 1
7: - 8: - 9: 0 10: - 11: 0 12: 5

Largest of node 3 and its children is node 3.
No swap is necessary, heapify done.
Heap size: 13 Array contents: A9A-251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.

Heap size: 13
Array contents: A9A-251--0-05ABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 12 Array contents: 59A-251--0-0AABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 12 Array contents: 59A-251--0-0AABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 12 Array contents: A95-251--0-0AABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 2 and its children is node 2.
No swap is necessary, heapify done.
Heap size: 12 Array contents: A95-251--0-0AABCDEEGGGHHIILMMOOPRRRSSSTT
0: A
1: 9 2: 5
3: - 4: 2 5: 5 6: 1
7: - 8: - 9: 0 10: - 11: 0
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 12 Array contents: A95-251--0-0AABCDEEGGGHHIILMMOOPRRRSSSTT

0: A
1: 9
2: 5
3: -
4: 2
5: 5
6: 1
7: -
8: -
9: 0
10: -
11: 0
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 11 Array contents: 095-251--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 11 Array contents: 095-251--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 11 Array contents: 905-251--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 1 and its children is node 4.
Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 11 Array contents: 905-251--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 4.
Heap size: 11 Array contents: 925-051--0-AABCDEEGHIIILMMOPRRRSSSTT
Largest of node 4 and its children is node 4.
No swap is necessary, heapify done.
Heap size: 11 Array contents: 925-051--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT

<table>
<thead>
<tr>
<th>Array index</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
</tr>
</tbody>
</table>

Largest of node 4 and its children is node 4.
No swap is necessary, heapify done.
Heap size: 11 Array contents: 925-051--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap. The last element takes its place and the heap size is decremented.

Heap size: 11 Array contents: 925-051--0-AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 10 Array contents: -25-051--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 10 Array contents: -25-051--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 10 Array contents: 52--051--09AAABCDEEGGGHHIILMMOOPRRRSSSTT

Running heapify on node 2.
Heap size: 10 Array contents: 52--051--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 2 and its children is node 5. Root and max will be swapped and heapify will recurse on the new node 5. Heap size: 10 Array contents: 52--051--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 5.
Heap size: 10 Array contents: 525-0-1--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 5 and its children is node 5.
No swap is necessary, heapify done.
Heap size: 10
Array contents: 525-0-1--09AAABCDEEGGGHHIILMMOOPRRRSSSTT

Largest of node 5 and its children is node 5.
No swap is necessary, heapify done.
Heap size: 10
Array contents: 525-0-1--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 10 Array contents: 525-0-1--09AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 9 Array contents: 025-0-1--59AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2. 
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 9 Array contents: 025-0-1--59AAABCDEEGGGHHIILMMOOPR4RSSSTT
Running heapify on node 2.
Heap size: 9 Array contents: 520-0-1--59AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 9 Array contents: 5200-1-59AAABCDEEGGGHHIILMMOOPR5SSSTT
Running heapify on node 6.
Heap size: 9 Array contents: 521-0-0--59AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 6 and its children is node 6.
No swap is necessary, heapify done.
Heap size: 9 Array contents: 521-0-0--59AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 9 Array contents: 521-0-0--59AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 8 Array contents: -21-0-0-559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 8 Array contents: -21-0-0-559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 8 Array contents: 2-1-0-0-559AAABCDEGGHIIILMOOPRRRSSSTT
Largest of node 1 and its children is node 4.
Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 8 Array contents: 2-1-0-0-559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 4.
Heap size: 8 Array contents: 201---0-559AAABCDEEGHHIILMMOOPRRRSSSTT
Largest of node 4 and its children is node 4.
No swap is necessary, heapify done.
Heap size: 8 Array contents: 201---0-559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 8 Array contents: 201---0-559AAABCDEEGGGHHIILMMOOPPRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 7 Array contents: -01---02559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 7 Array contents: -01---02559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 7 Array contents: 10----02559AAABCDEGHHIILMMOOPRRSSSTT
Largest of node 2 and its children is node 6.
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 7 Array contents: 10----02559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 6.
Heap size: 7 Array contents: 100----2559AAABCDEGHHIILMMOOPRRRSSSTT
Largest of node 6 and its children is node 6.
No swap is necessary, heapify done.
Heap size: 7 Array contents: 100----2559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 7 Array contents: 100----2559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 6 Array contents: -00---12559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 1.
Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 6 Array contents: -00---12559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 1.
Heap size: 6 Array contents: 0-0---12559AAEDEGHHIIIIMMOOPRSSSSSTT
Largest of node 1 and its children is node 1.
No swap is necessary, heapify done.
Heap size: 6 Array contents: 0-0---12559AAABCDEEGGGHHIILMMOOPRRRSSSTT

1.
2.
3.
4.
5.
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 6 Array contents: 0-0-1259AAABCDEEGGHIIILMOOPRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 5 Array contents: -0-01259AAABCDEEGGHIIILMNOOPRRRSSSTT
Largest of node 0 and its children is node 2.
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 5 Array contents: --0--012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 2.
Heap size: 5 Array contents: 0—01259AAABCDEEGGHHIIILMMOOPRRRSSSTT
Largest of node 2 and its children is node 2. No swap is necessary, heapify done.
Heap size: 5 Array contents: 0—01259AAABCDEEFGHIIILMMOOPRRSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 5 Array contents: 0-01259AAABCDEEGHIIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 4 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 0.
No swap is necessary, heapify done.
Heap size: 4 Array contents: ---0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 4 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 3 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 0.
No swap is necessary, heapify done.
Heap size: 3 Array contents: ---0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 3 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 2 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 0.
No swap is necessary, heapify done.
Heap size: 2 Array contents: ---0012559AAABCDEEGGHHIIILMOOPRRRSSSTT
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 2 Array contents: ---0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 1 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT
Largest of node 0 and its children is node 0.
No swap is necessary; heapify done.
Heap size: 1 Array contents: ----0012559AAABCDEEGGGHIIIMMOOPRRRSSSTT
Heap empty, sorting complete.
Heap size: 0 Array contents: ----0012559AAABCDEEGGGHHIILMMOOPRRRSSSTT