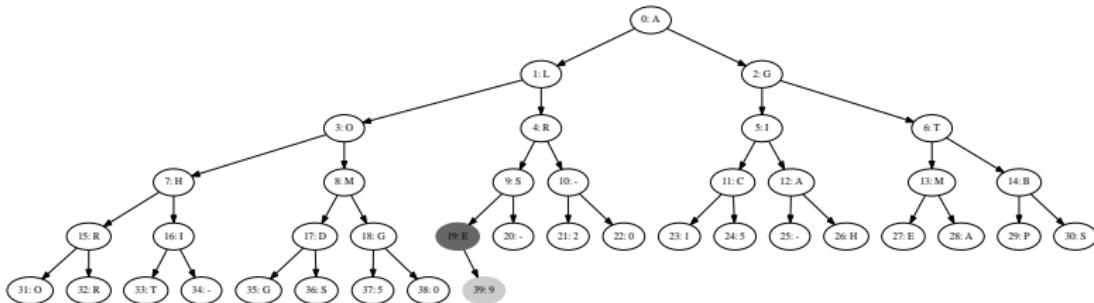


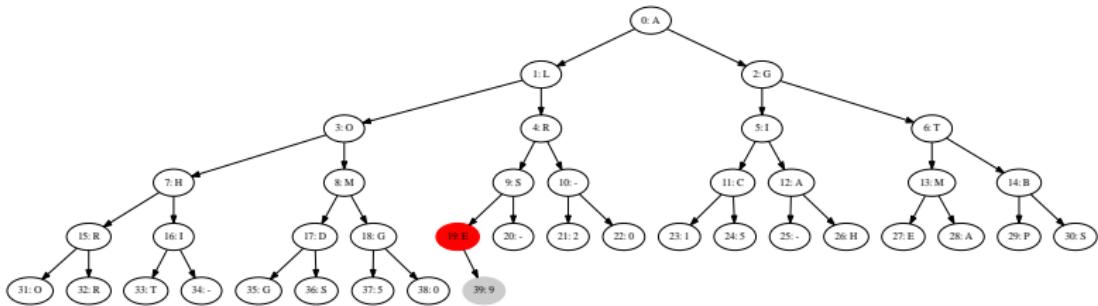
Initially the array may not satisfy the heap property.

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-GS09



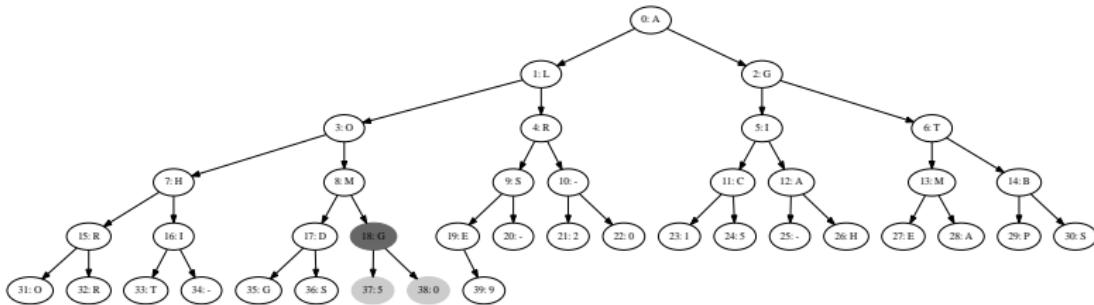
Running heapify on node 19 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509



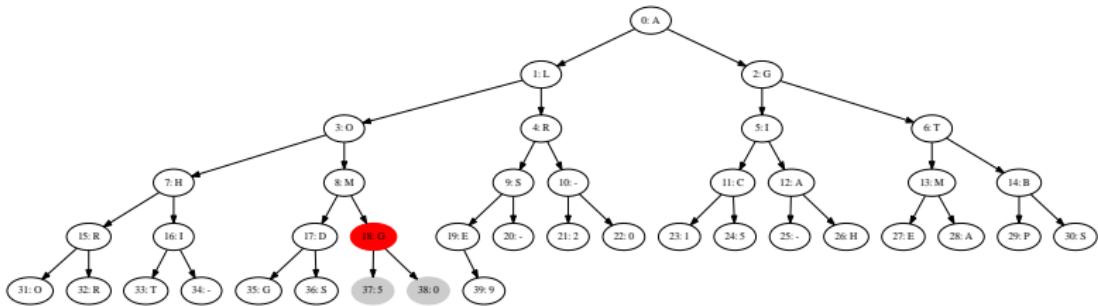
Largest of node 19 and its children is node 19.

No swap is necessary, heapify done.

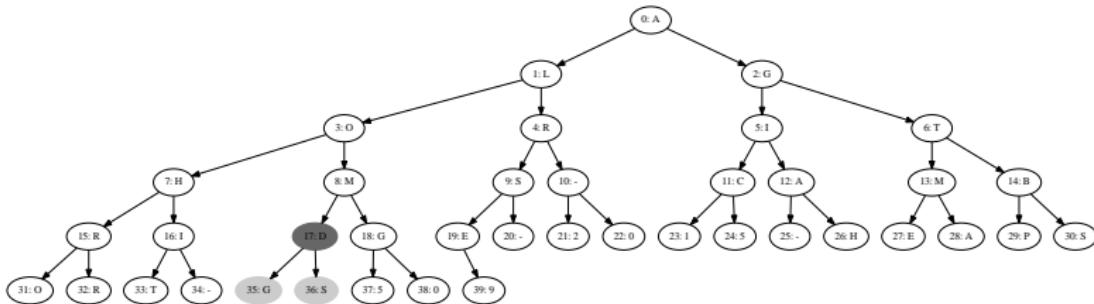
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS09



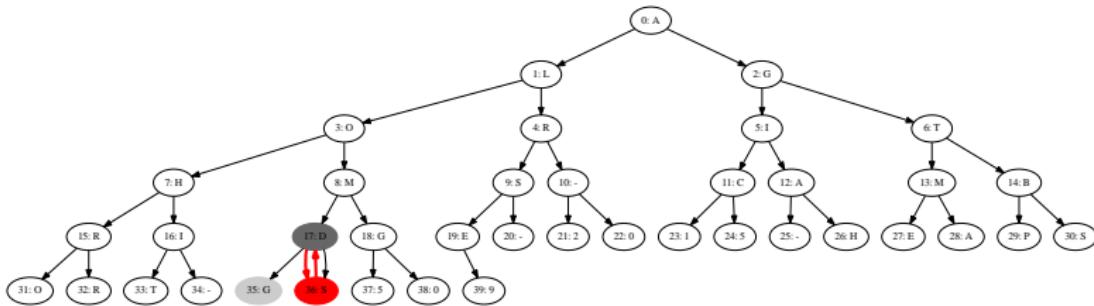
Running heapify on node 18 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509



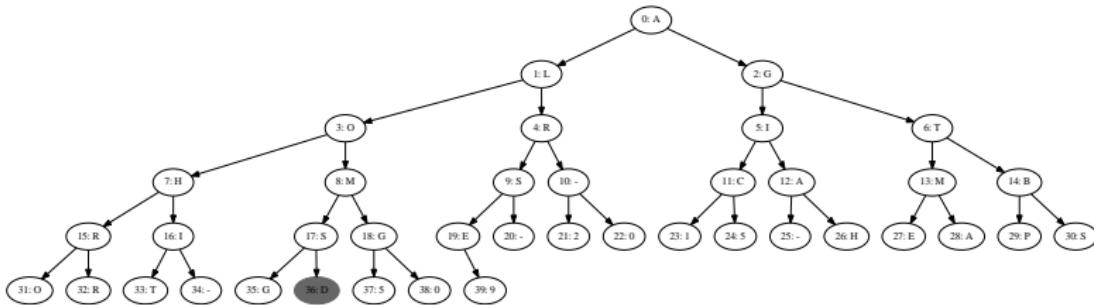
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS09

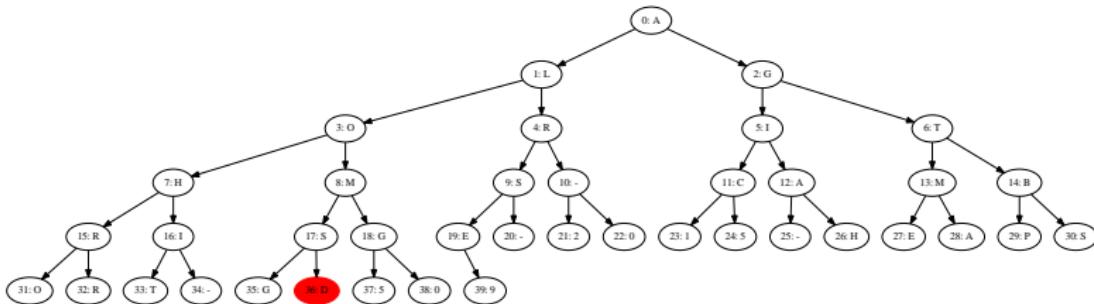


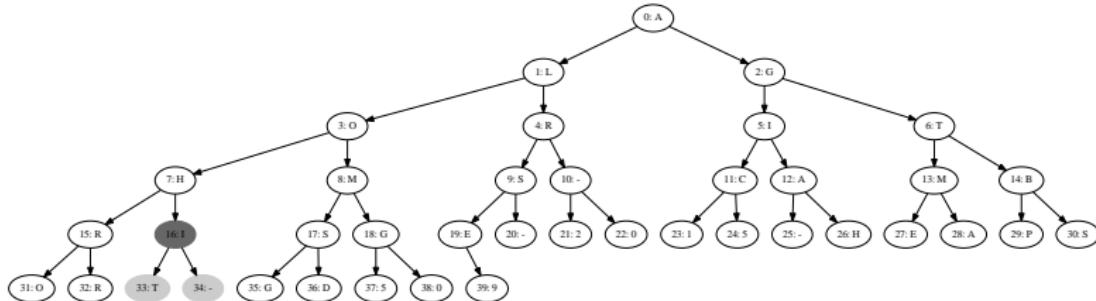
Running heapify on node 17 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGE-2015-HEAPSORT-GS509



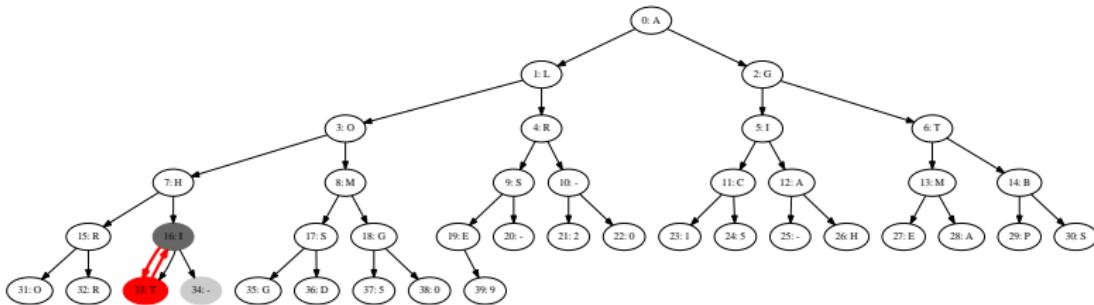
Largest of node 17 and its children is node 36.
Root and max will be swapped and heapify will recurse on the new node 36.
Heap size: 40 Array contents: ALGORITHMS-CAMBRIDGIE-2015-HEAPSORT-GS509



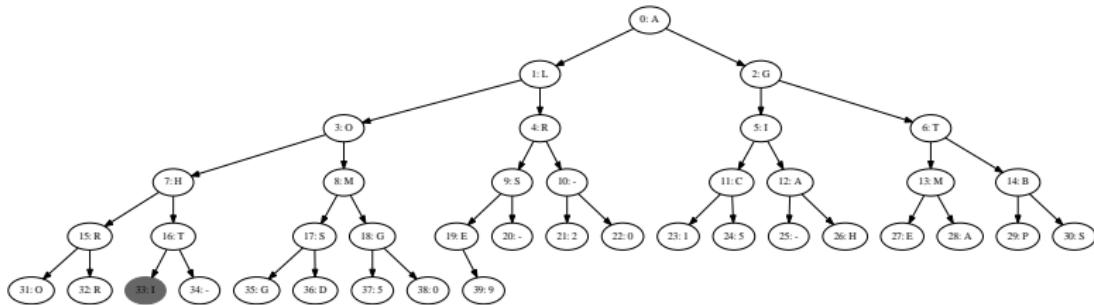


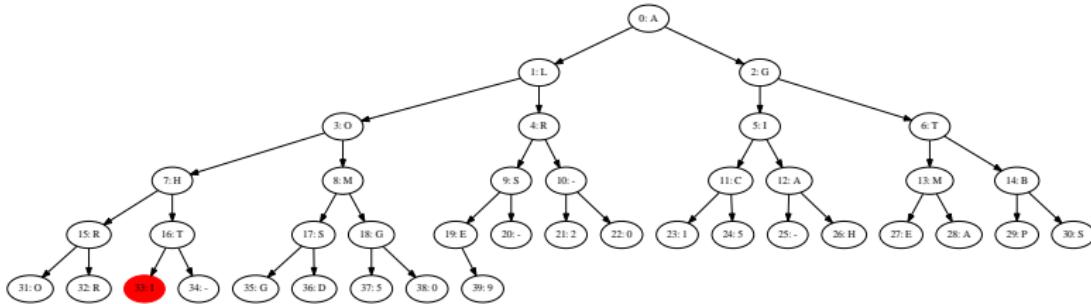


Running heapify on node 16 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRISGIE-2015-HEAPSORT-GD509



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-CAMBRISGE-2015-HEAPSORT-GD509

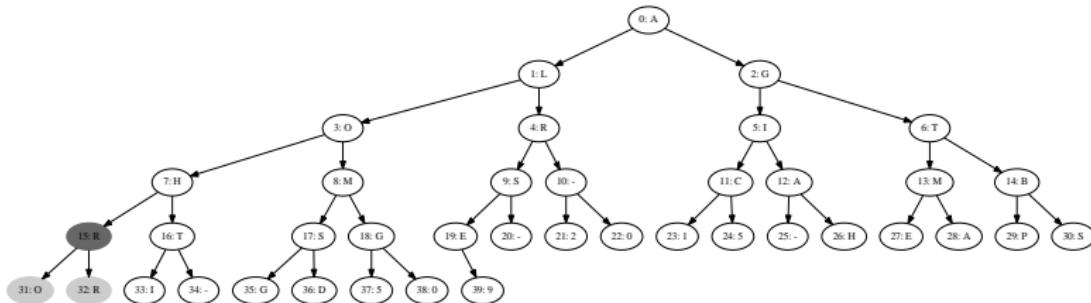




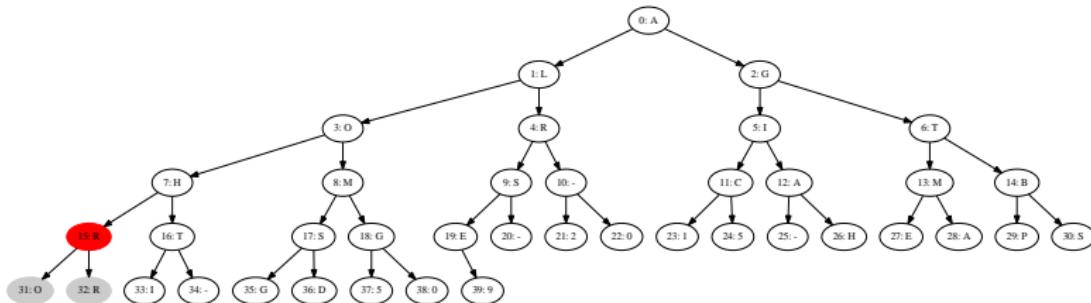
Largest of node 33 and its children is node 33.

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITHMS-CAMBRSGE-2015-HEAPSORI-GD509



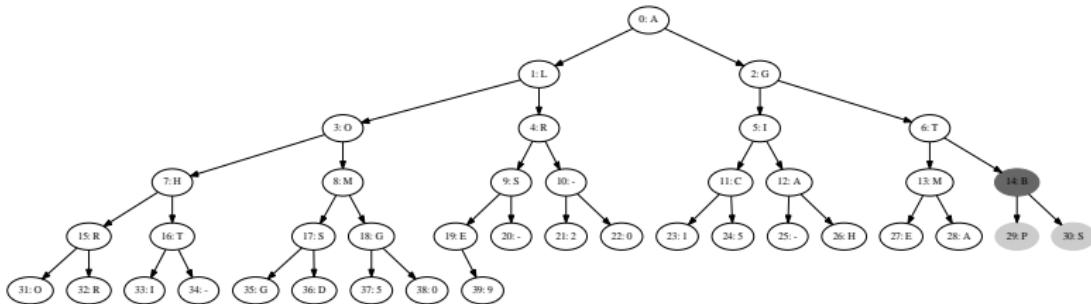
Running heapify on node 15 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509



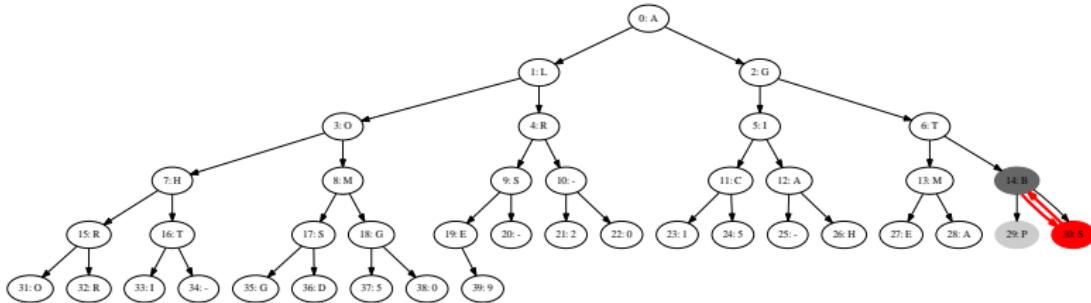
Largest of node 15 and its children is node 15

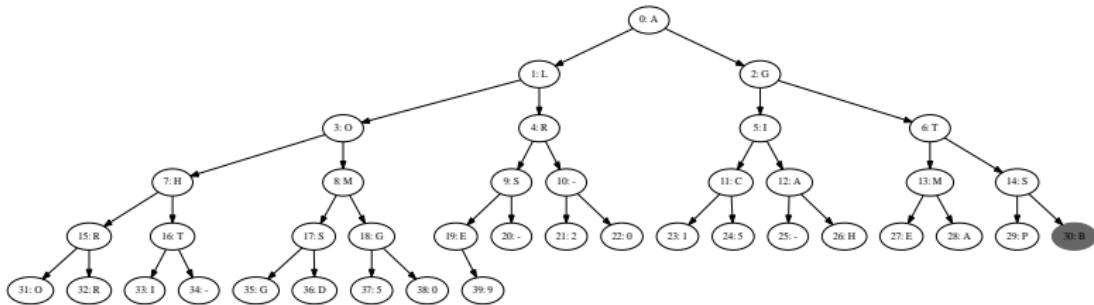
No swap is necessary, heapify done.

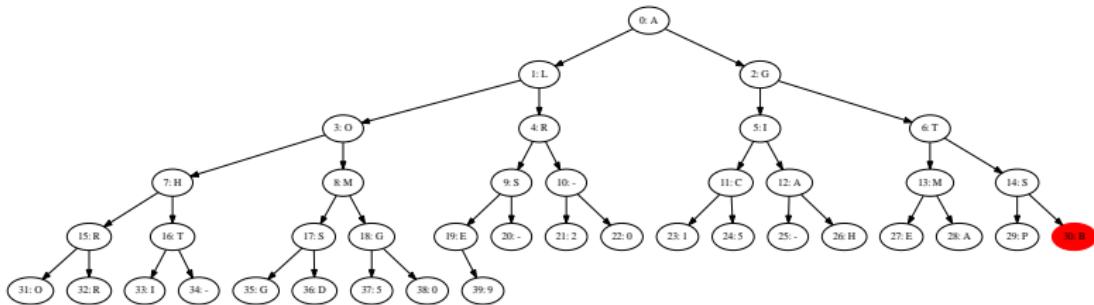
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509



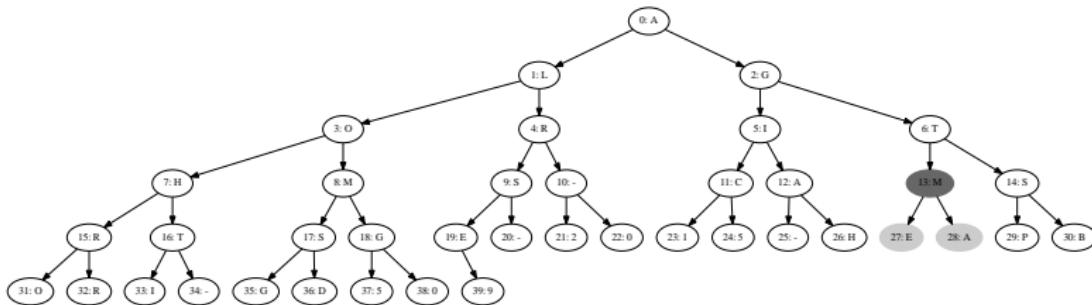
Running heapify on node 14 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CAMBRTSGE-2015-HEAPSORI-GD509

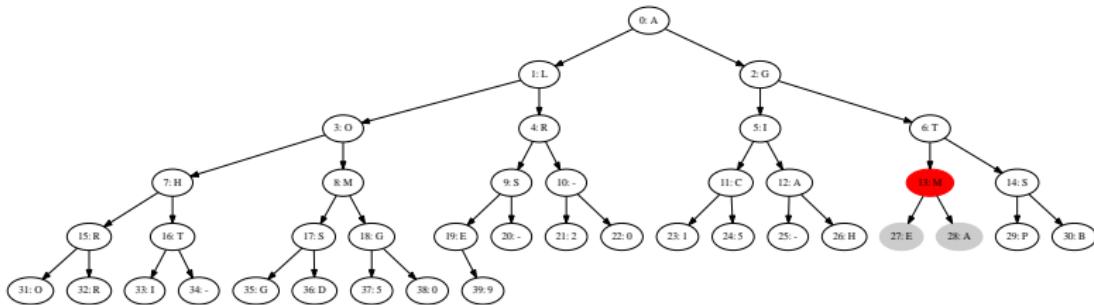




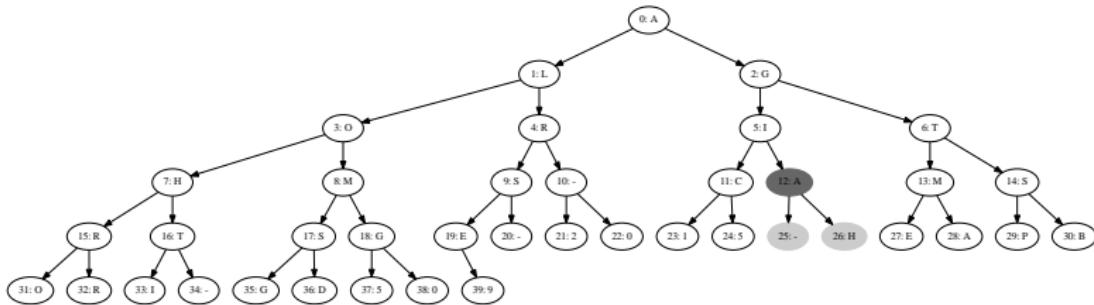


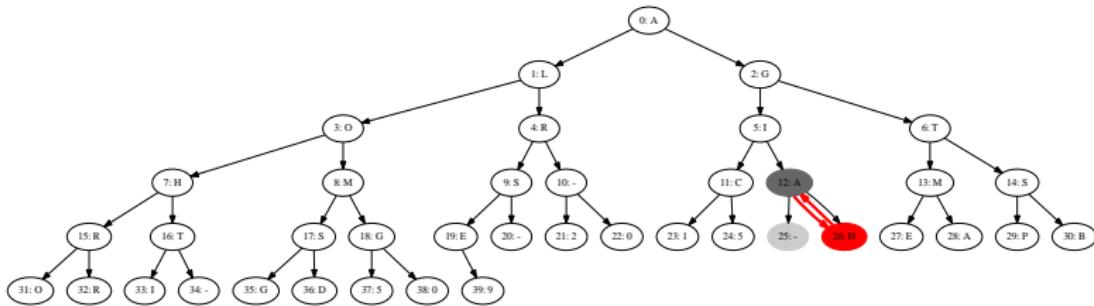
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509



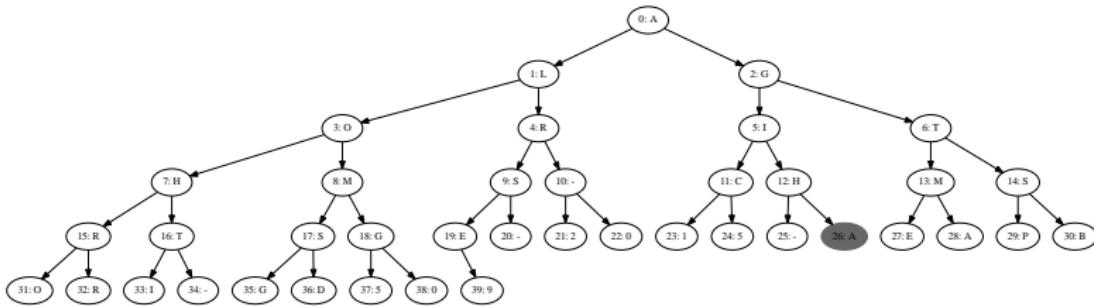


Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509

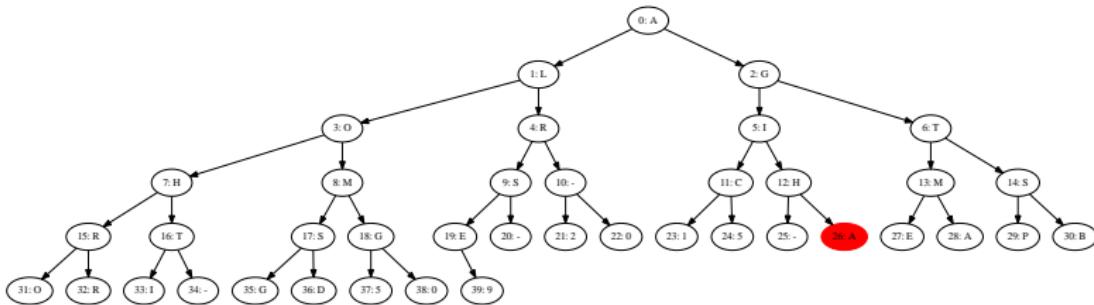




Largest of node 12 and its children is node 26.
Root and max will be swapped and heapify will recurse on the new node 26.
Heap size: 40 Array contents: ALGORITHMS-CAMSRTSGE-2015-HEAPBORI-GD509



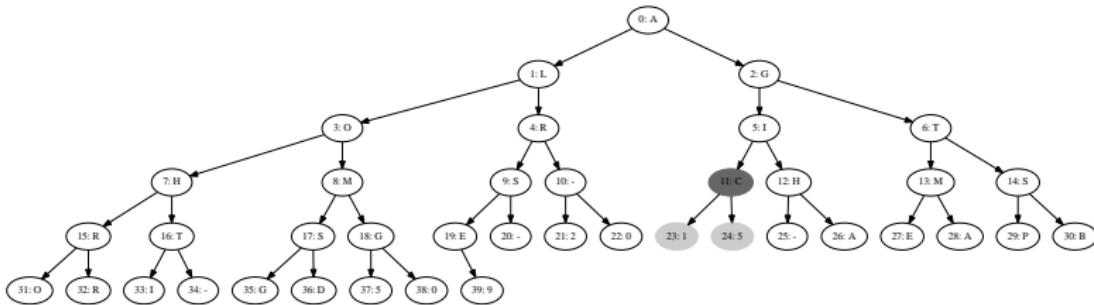
Running heapify on node 26.
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509



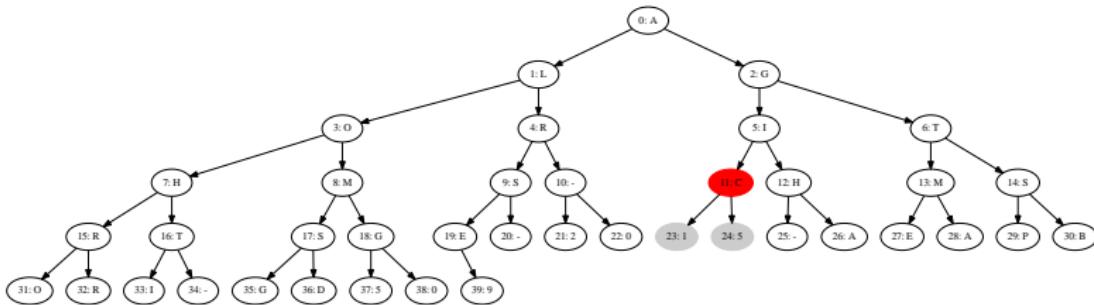
Largest of node 26 and its children is node 26.

No swap is necessary, heapify done.

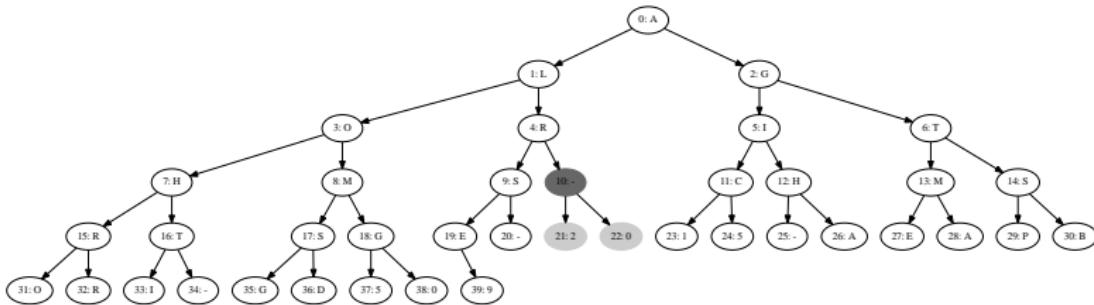
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509

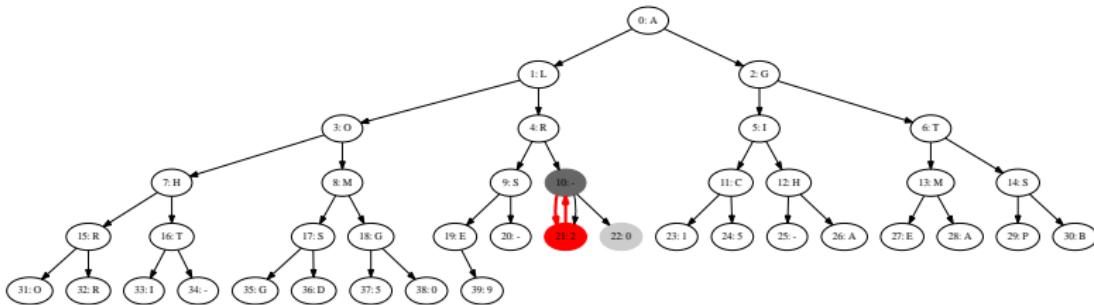


Running heapify on node 11 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509

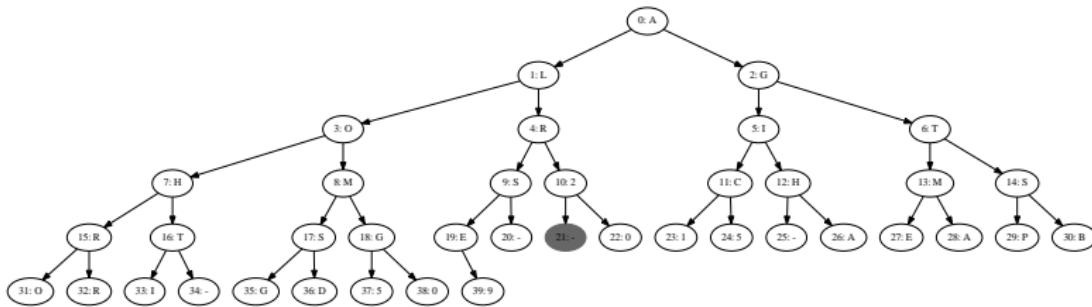


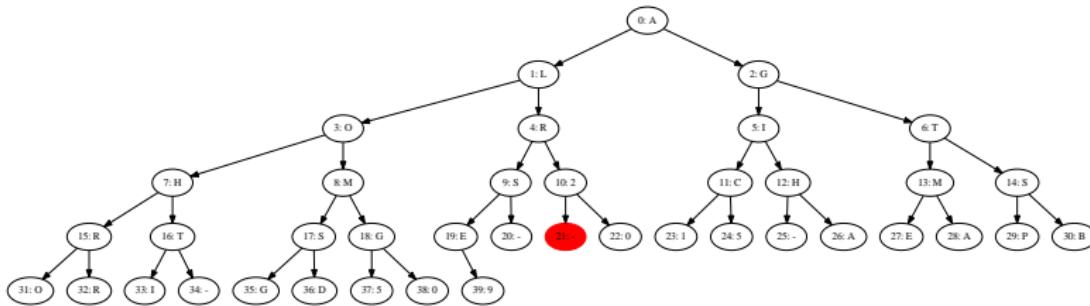
Heap size: 40 Array contents: ALGORITHMS-CHMSRTSGE-2015-AEAPBORI-GD509





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-CHMSRTSGE-2015-AEAPBORI-GD509

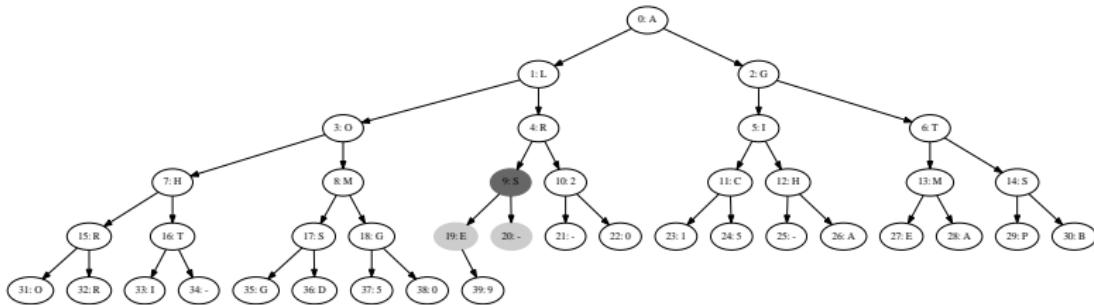


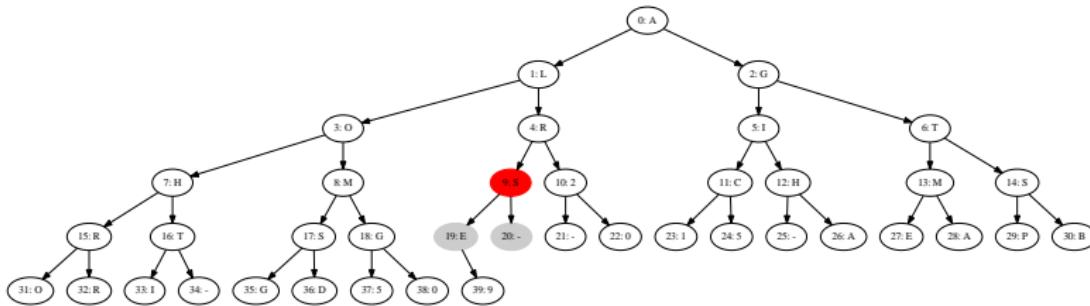


Largest of node 21 and its children is node 21

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITHMS2CHMSRTSGE--015-AEAPBORI-GD509

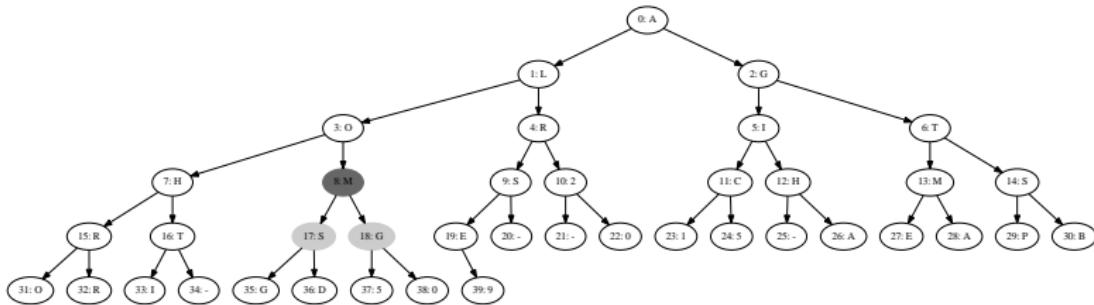




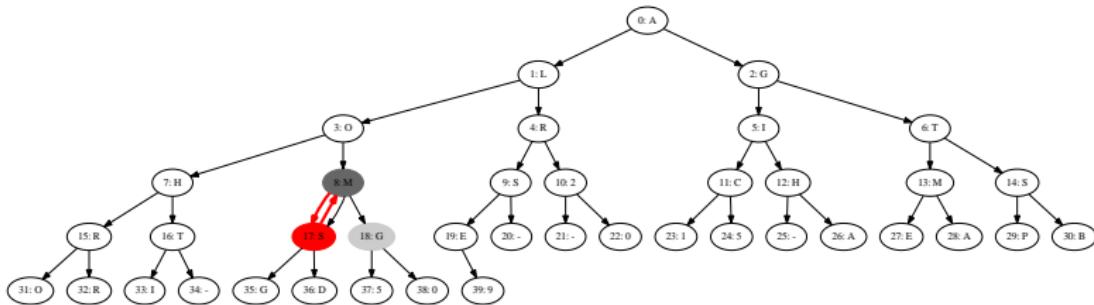
Largest of node 9 and its children is node 9

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITHMS2CHMSRTSGE--015-AEAPBORI-GD509



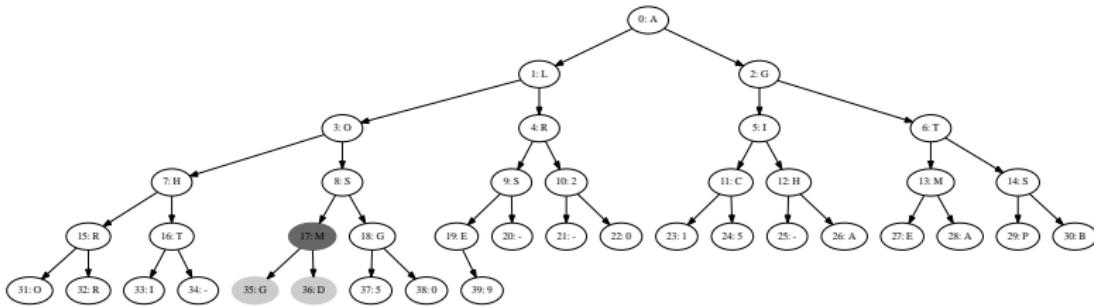
Running heapify on node 8 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS2CHMSRTSGE-015-AEAPBORI-GD509

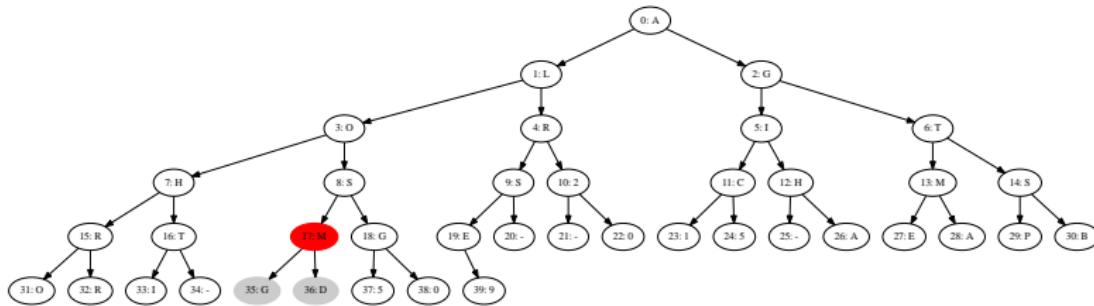


Largest of node 8 and its children is node 17.

Root and max will be swapped and heapify will recurse on the new node 17.

Heap size: 40 Array contents: ALGORITHMS2CHMSRTSGE-015-AEAPBORI-GD509

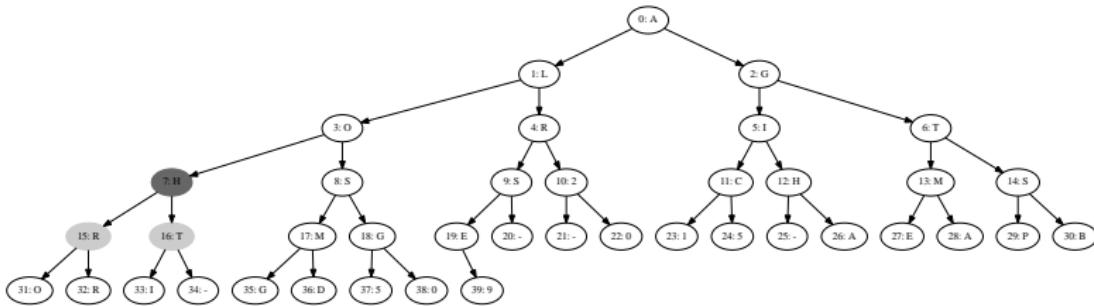




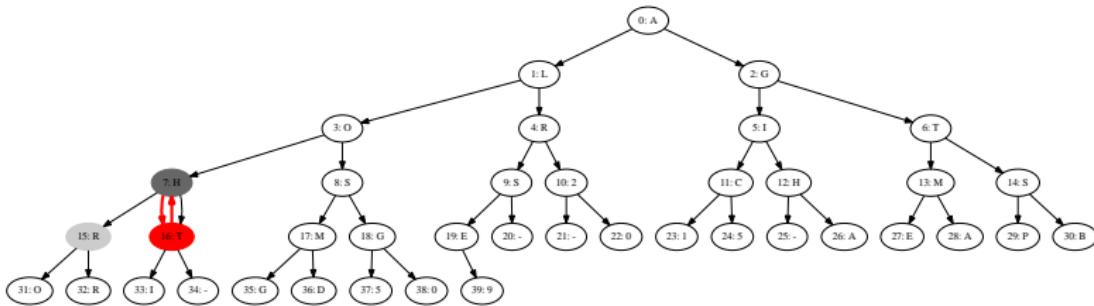
Largest of node 17 and its children is node 17

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITHSS2CHMSRTMGE--015-AEAPBORI-GD509

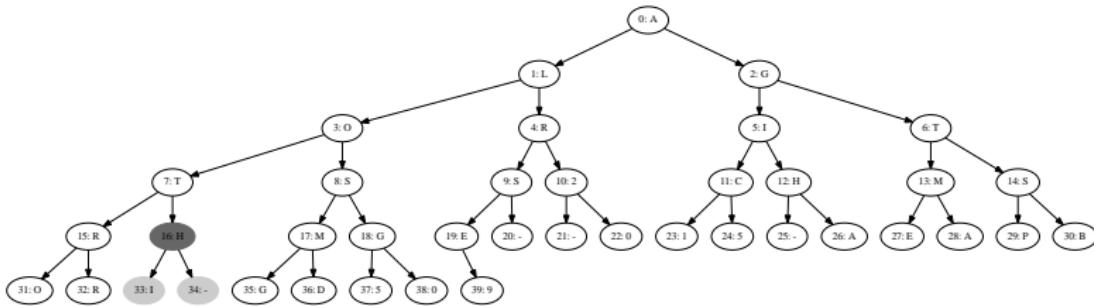


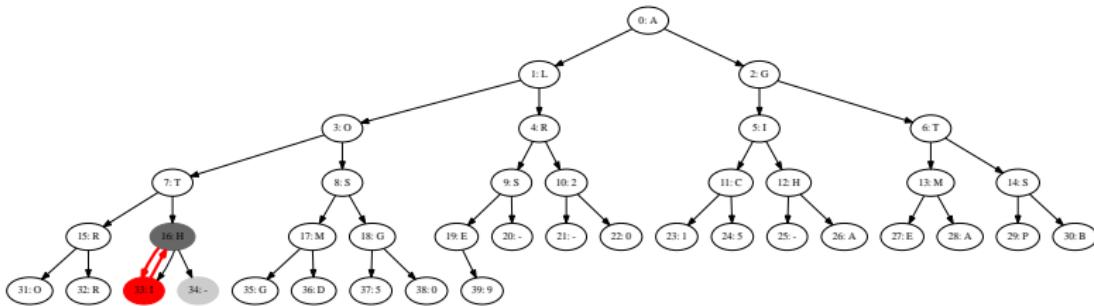
Running heapify on node 7 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITHMS2CHMSRTMGE-015-AEAPBORI-GD509



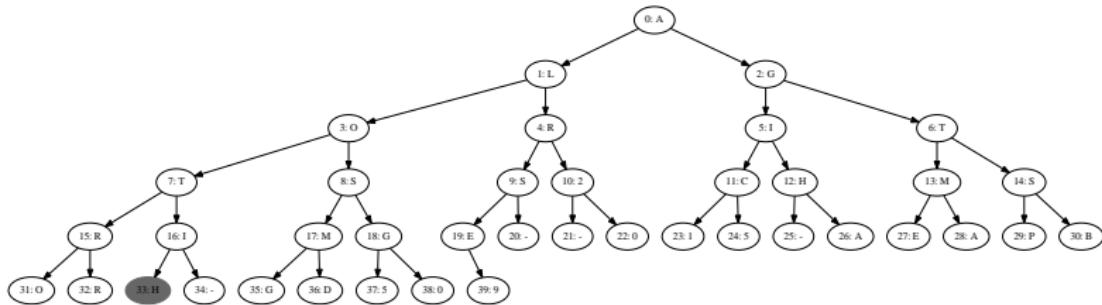
Largest of node 7 and its children is node 16.

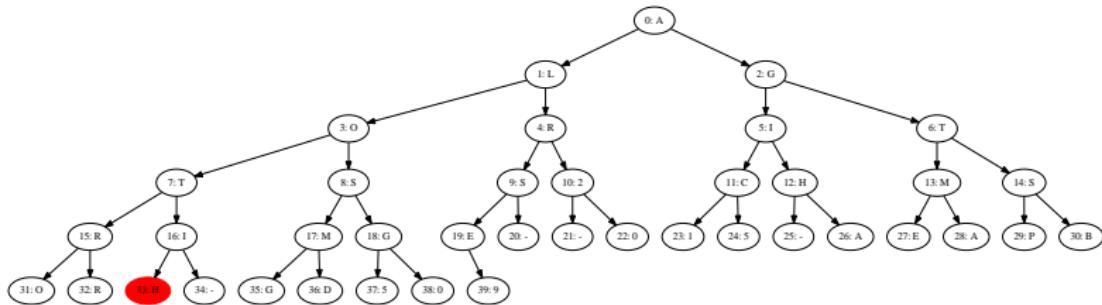
Root and max will be swapped and heapify will recurse on the new node 16.
 Heap size: 40 Array contents: ALGORITHMS2CHMSRTMGE-015-AEAPBORI-GD509





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: ALGORITSS2CHMSRHMGEG-015-AEAPBORI-GD509

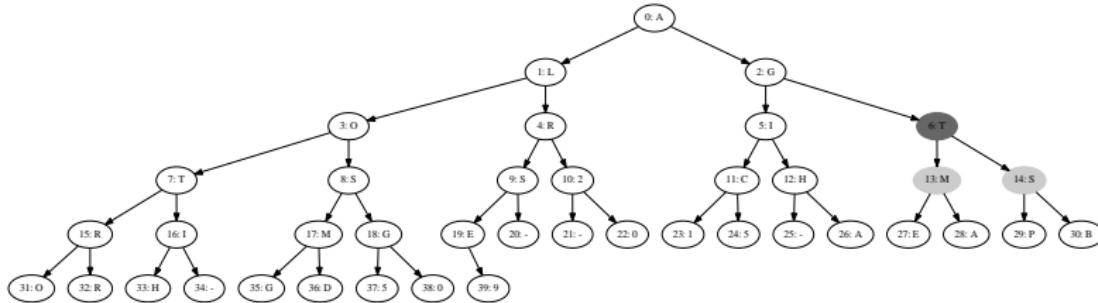


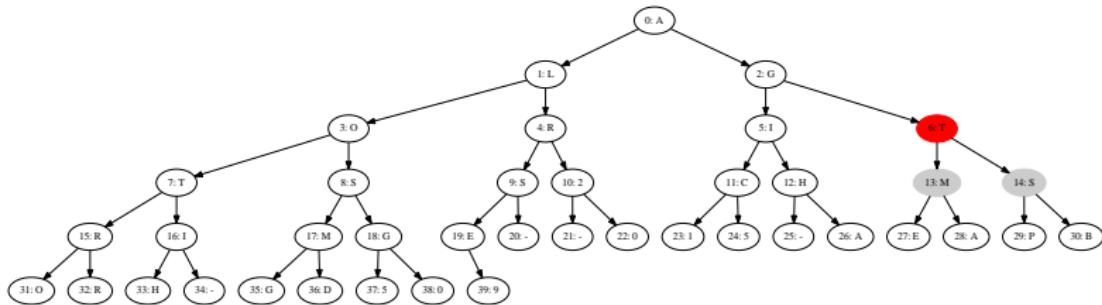


Largest of node 33 and its children is node 33.

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITSS2CHMSRIMGE-015-AEAPBORH-GD509

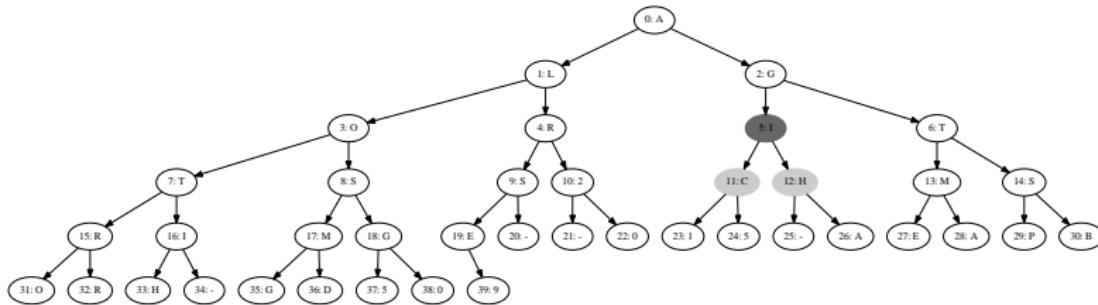


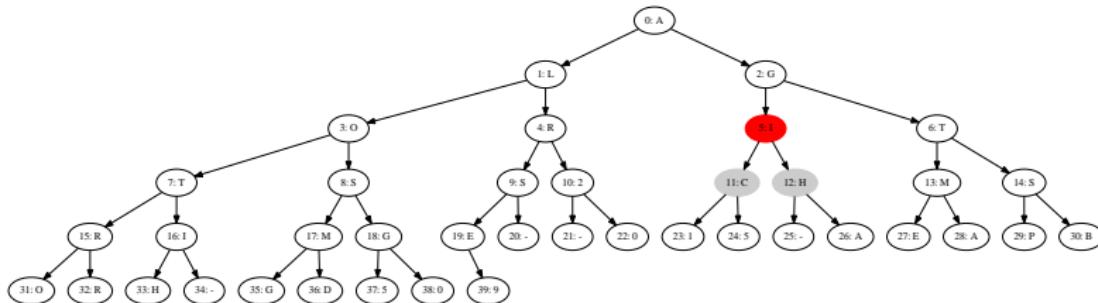


Largest of node 6 and its children is node 6.

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITSS2CHMSRIMGE-015-AEAPBORH-GD509

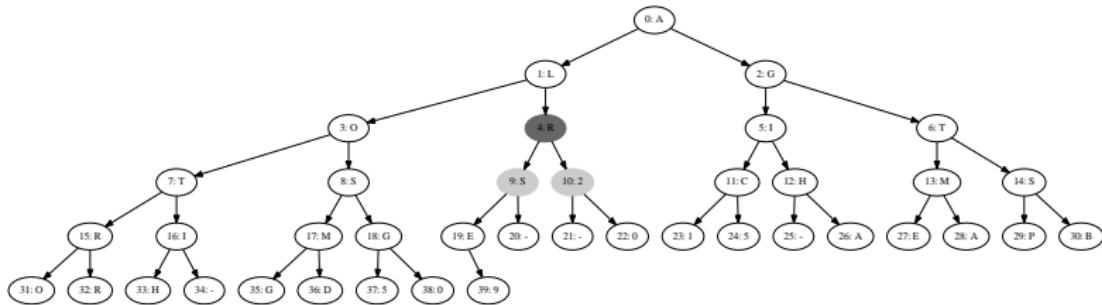




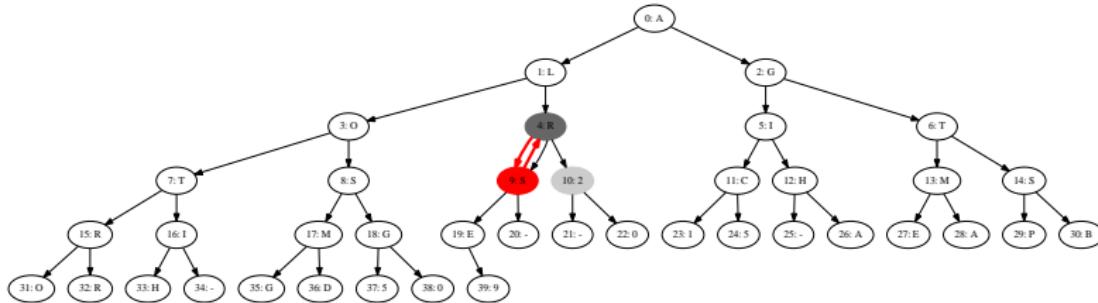
Largest of node 5 and its children is node 5

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGORITTSS2CHMSRIMGE--015-AEAPB0RH-GD509

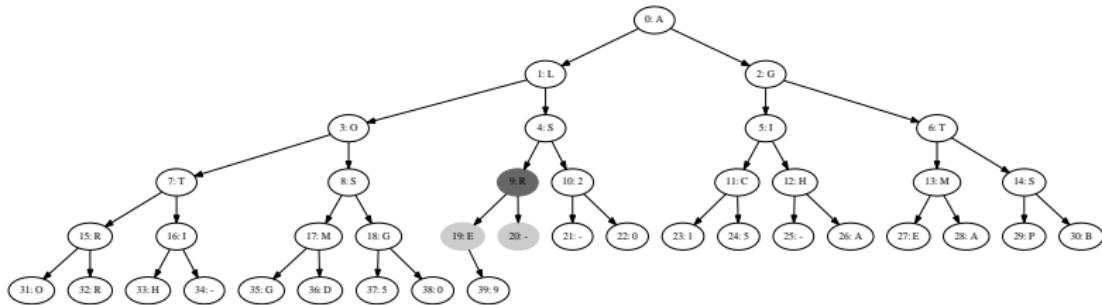


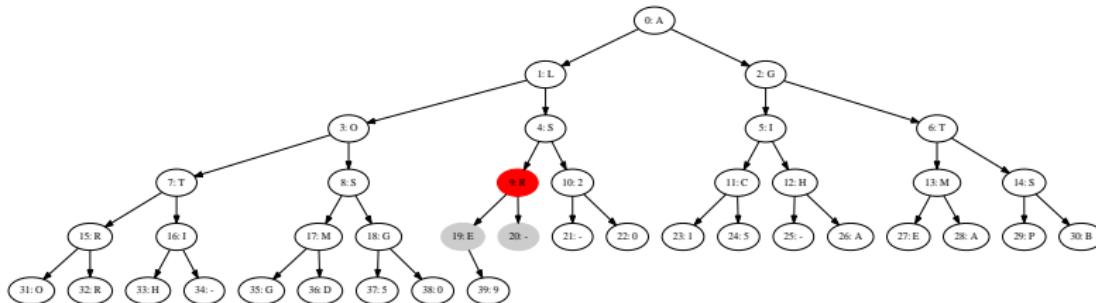
Running heapify on node 4 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGORITSS2CHMSRIMGE-015-AEAPBORH-GD509



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: ALGORITSS2CHMSRIMGE-015-AEAPBORH-GD509

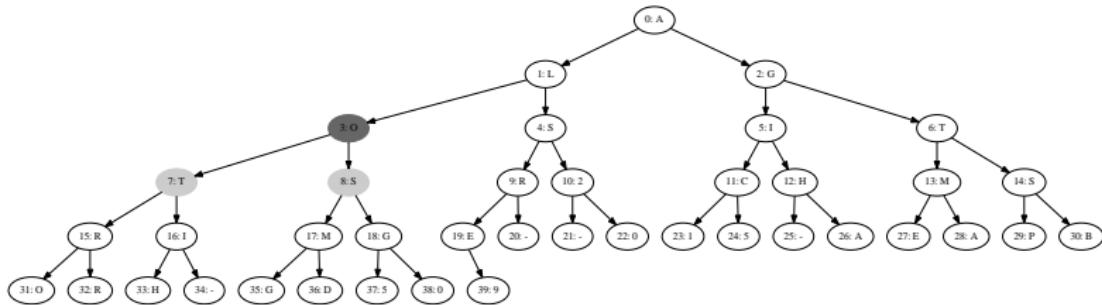




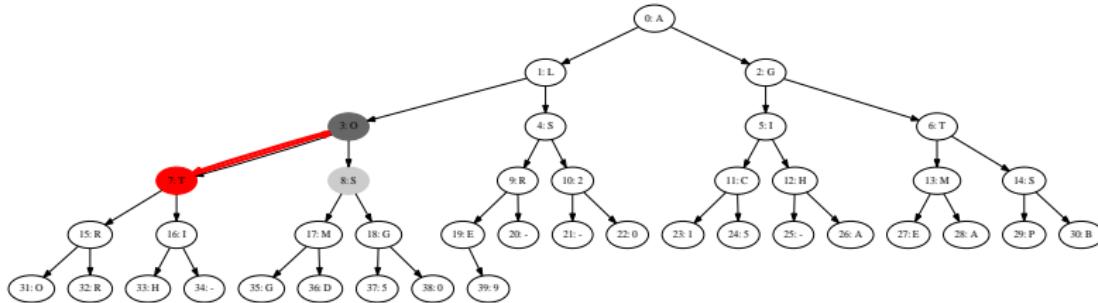
Largest of node 9 and its children is node 9

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALGOSITTSR2CHMSRIMGE--015-AEAPBORH-GD509

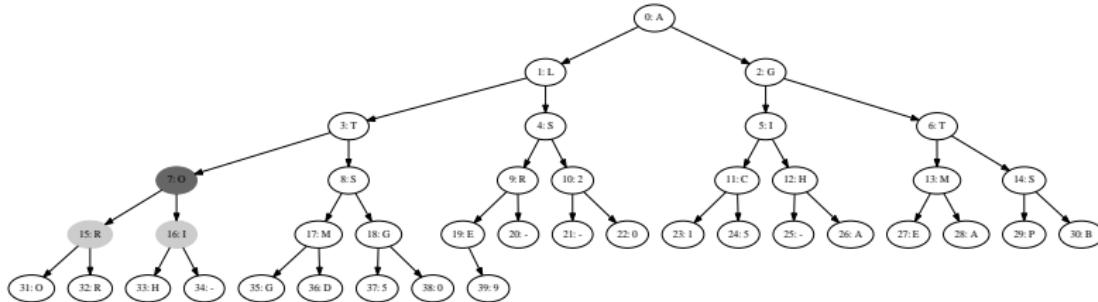


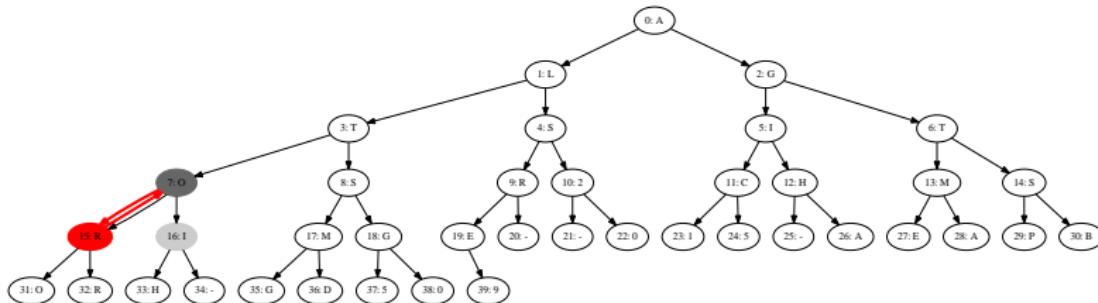
Running heapify on node 3 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGOSITTSR2CHMSRIMGE-015-AEAPBORH-GD509



Largest of node 3 and its children is node 7.

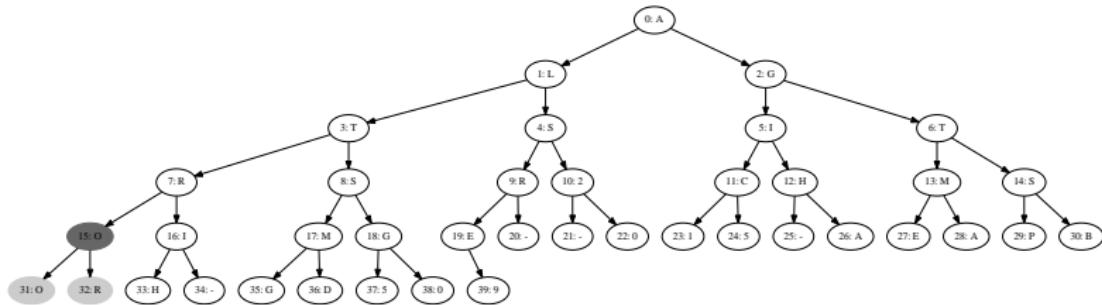
Root and max will be swapped and heapify will recurse on the new node 7.
 Heap size: 40 Array contents: ALGOISITTSR2CHMSRIMGE-015-AEAPBORH-GD509

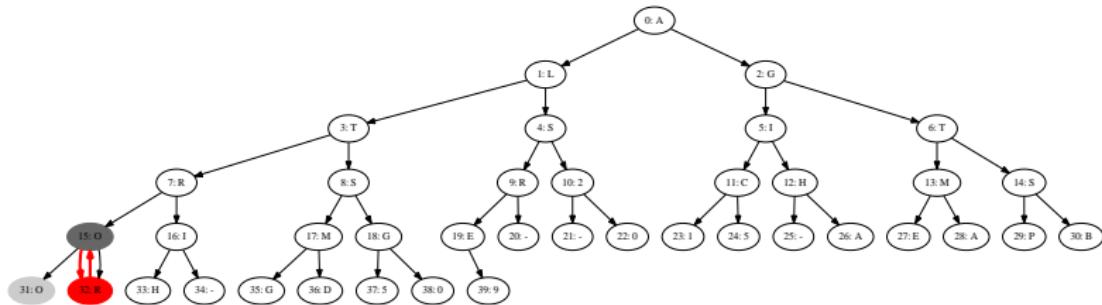


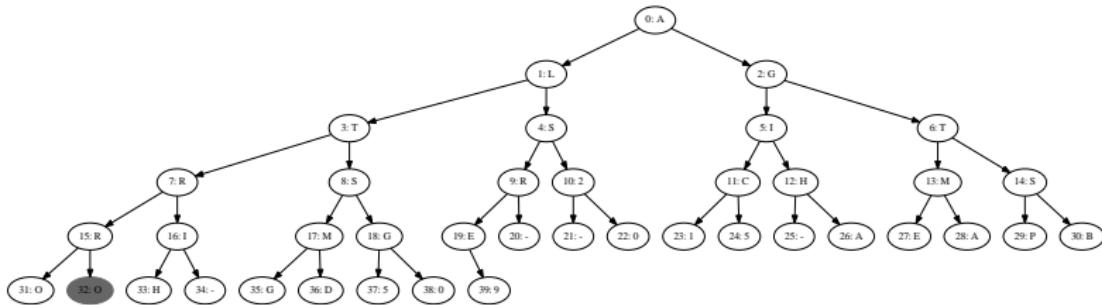


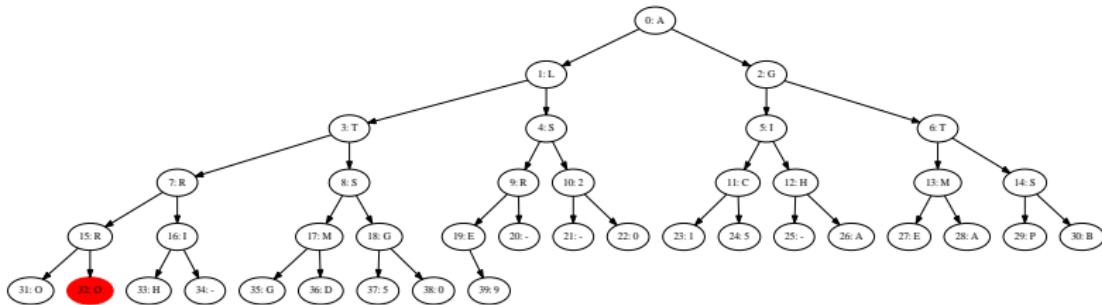
Largest of node 7 and its children is node 15.

Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 40 Array contents: AL.GTSITOSR2CHMSRIMGE-015-AEAPBIORH-GD509

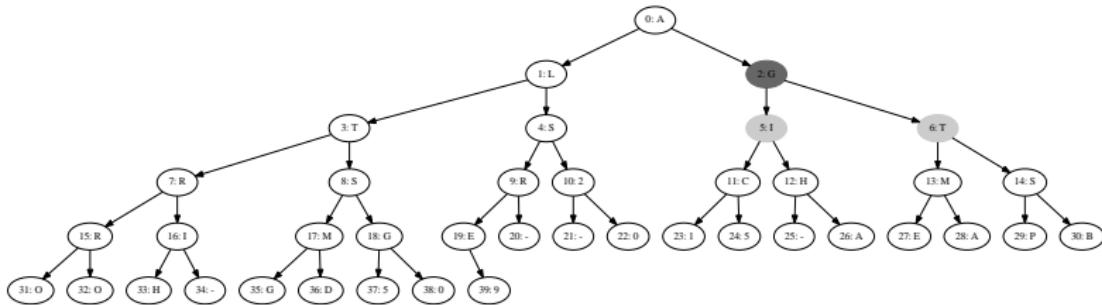




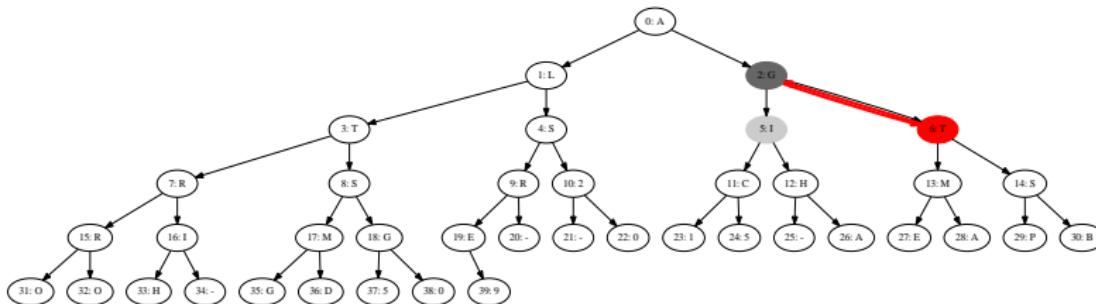




Heap size: 40 Array contents: ALGTTSITRSR2CHMSRIMGE-015-AEAPBOOH-GD509

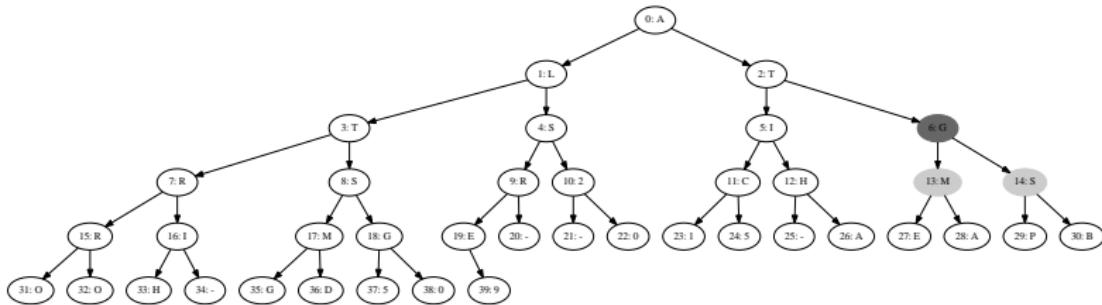


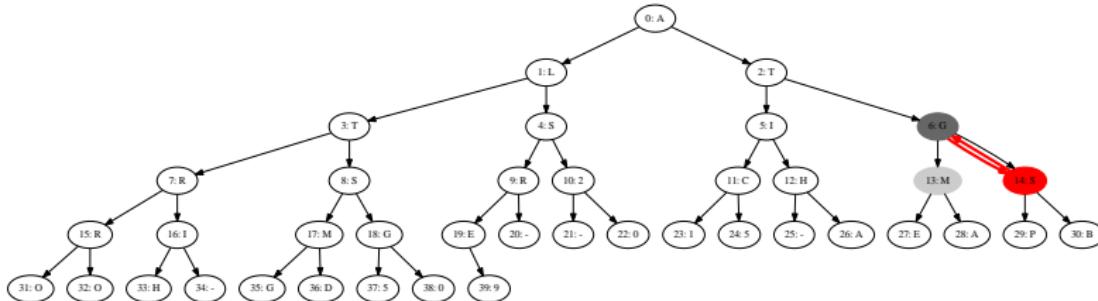
Running heapify on node 2 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALGTTSITRSR2CHMSRIMGE-015-AEAPBOOH-GD509



Largest of node 2 and its children is node 6.

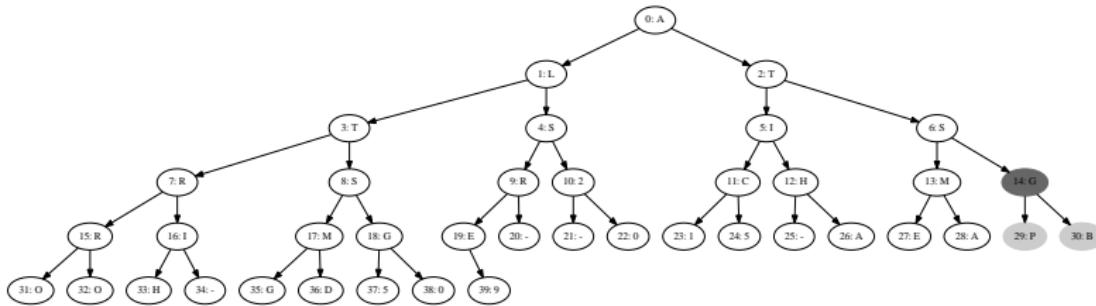
Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 40 Array contents: ALGTTSITRSR2CHMSRIMGE-015-AEAPBOOH-GD509



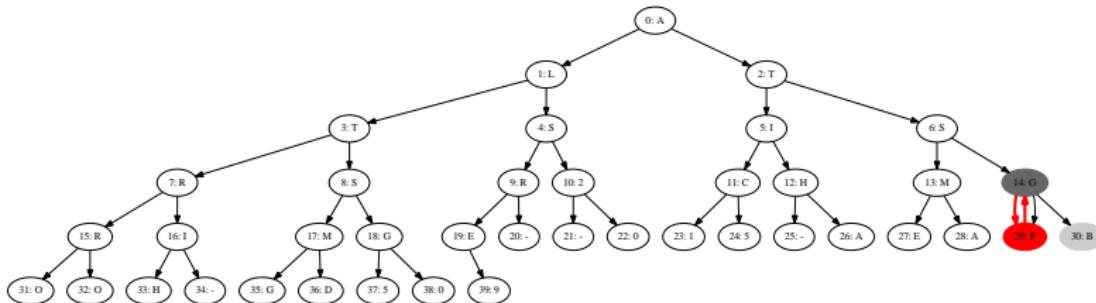


Largest of node 6 and its children is node 14.

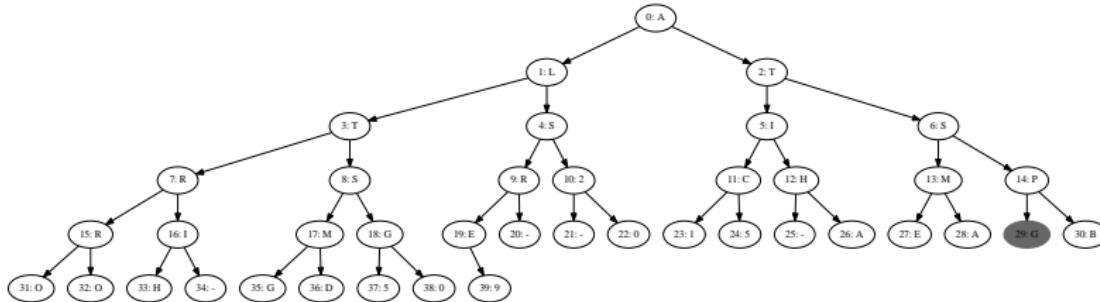
Root and max will be swapped and heapify will recurse on the new node 14.
Heap size: 40 Array contents: ALTTSIGRSR2CHMSRIMGE-015-AEAPBOOH-GD509



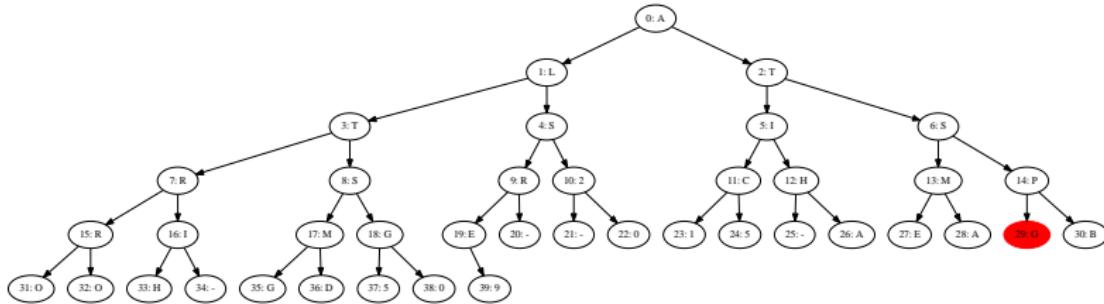
Running heapify on node 14.
Heap size: 40 Array contents: ALTTISRSR2CHMGRIMIGE-015-AEAPBOOH-GD509



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: ALTTISRSR2CHMGRIMGE-015-AEAPBOOH-GD509



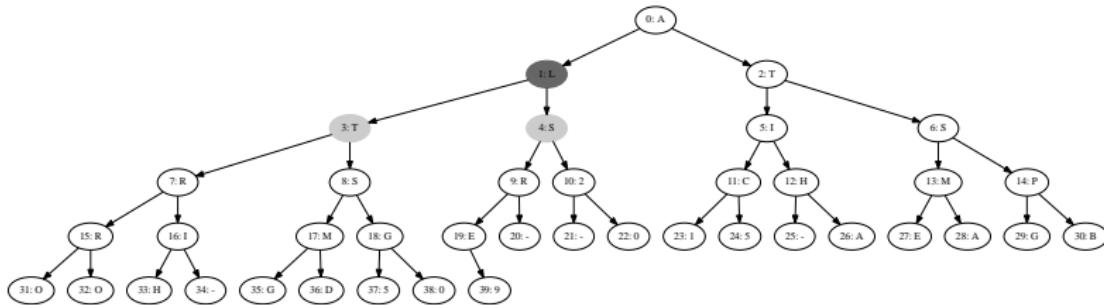
Running heapify on node 29.
Heap size: 40 Array contents: ALTTISRSR2CHMPRIMGE-015-AEAGBOOH-GD509



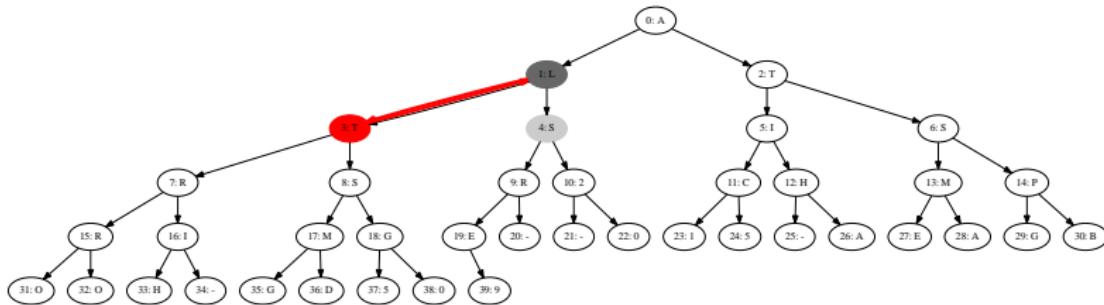
Largest of node 29 and its children is node 29.

No swap is necessary, heapify done.

Heap size: 40 Array contents: ALTTISRSR2CHMPRIMGE-015-AEAGBOOH-GD509

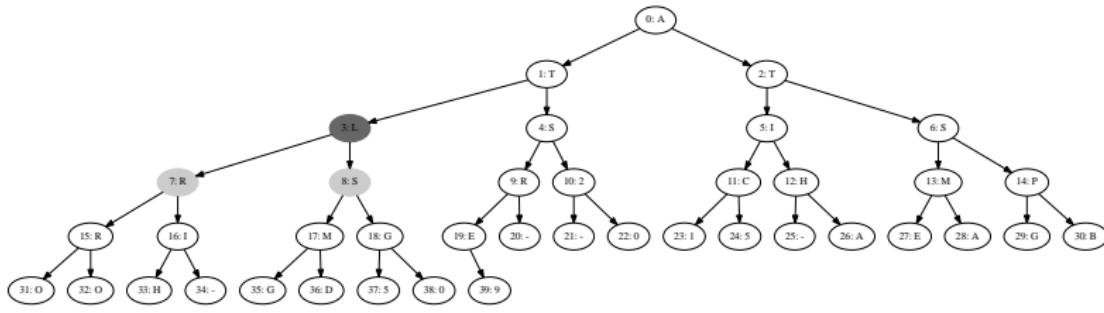


Running heapify on node 1 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ALTTISRSR2CHMPRIMGE-015-AEAGBOOH-GD509

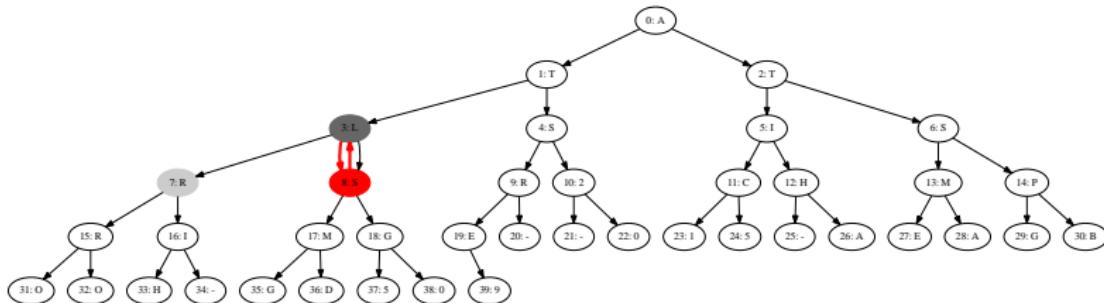


Largest of node 1 and its children is node 3.

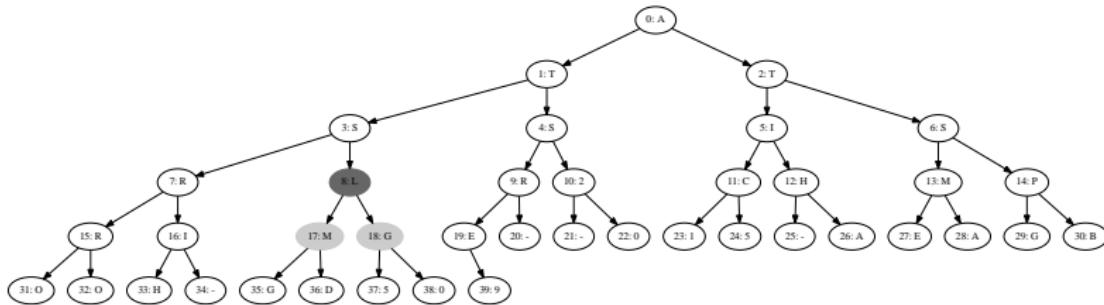
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 40 Array contents: ALTTISRSR2CHMPRIMGE-015-AEAGBOOH-GD509

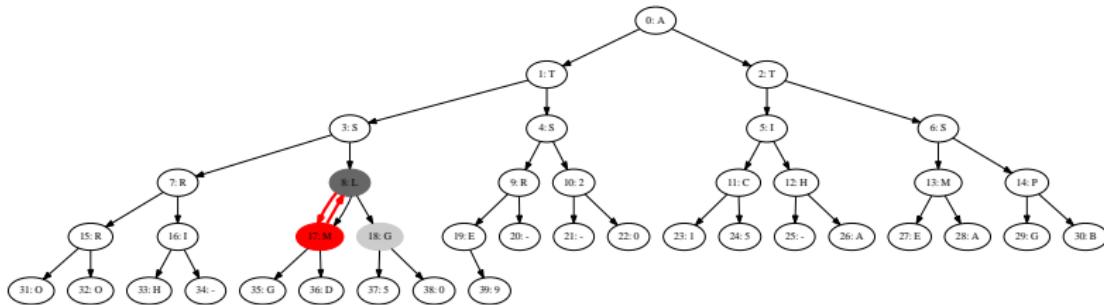


Running heapify on node 3.
Heap size: 40 Array contents: ATTLSISR5R2CHMPRIMGE--015-AEAGBOOH-GD509



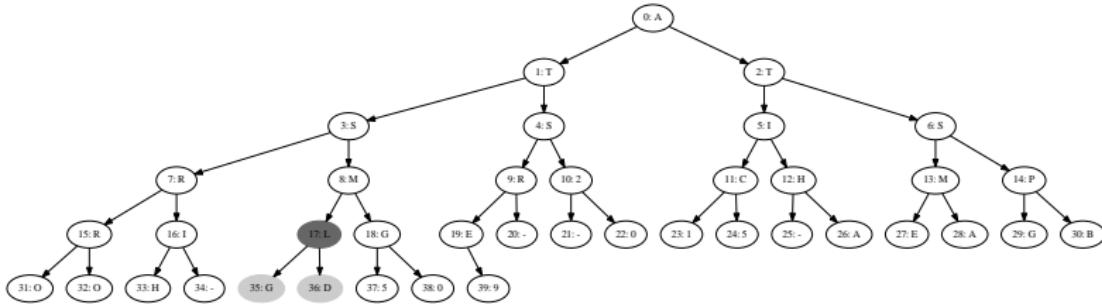
Largest of node 3 and its children is node 8.
Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 40 Array contents: ATTLISR5R5R2CHMPRIMGE--015-AEAGBOOH-GD509

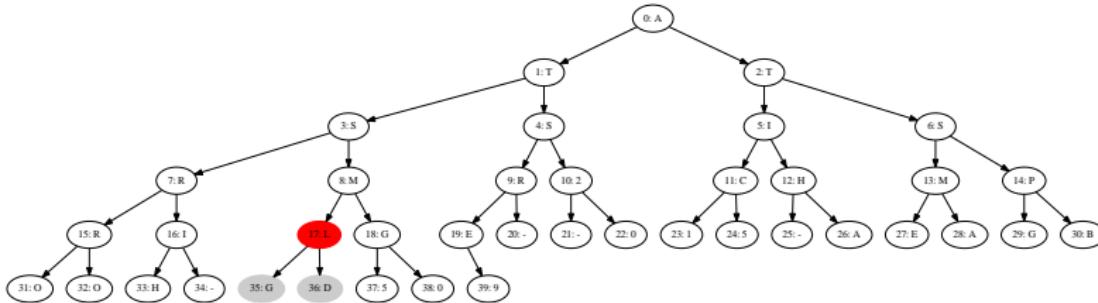




Largest of node 8 and its children is node 17.

Root and max will be swapped and heapify will recurse on the new node 17.
Heap size: 40 Array contents: ATTSSSISRLR2CHMPRIMGE-015-AEAGBOOH-GD509

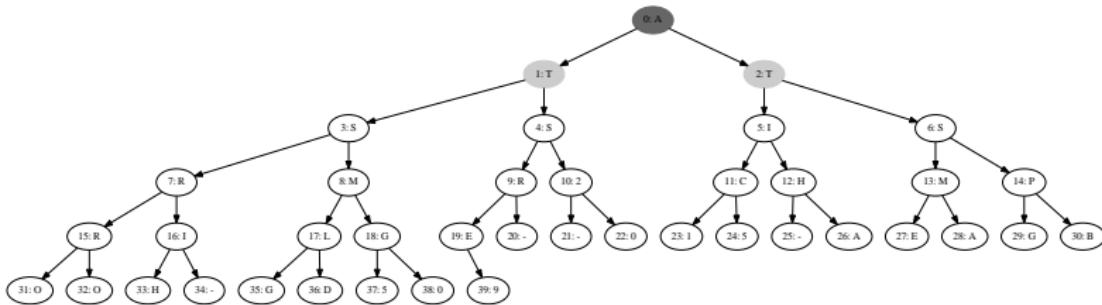




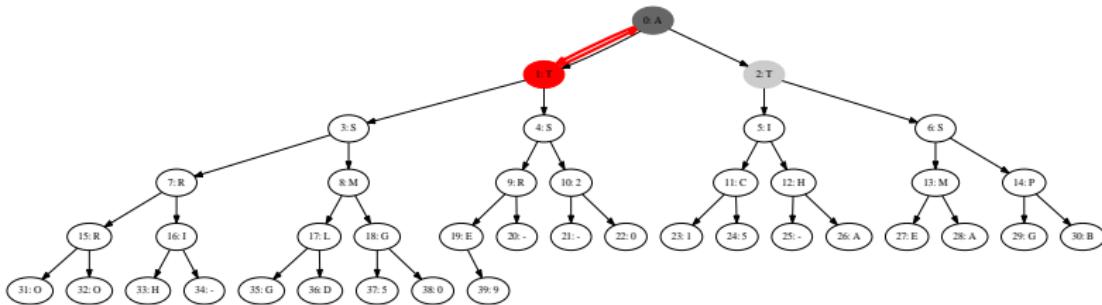
Largest of node 17 and its children is node 17.

No swap is necessary, heapify done.

Heap size: 40 Array contents: ATTSSSISRMR2CHMPRLIGE-015-AEAGBOOH-GD509

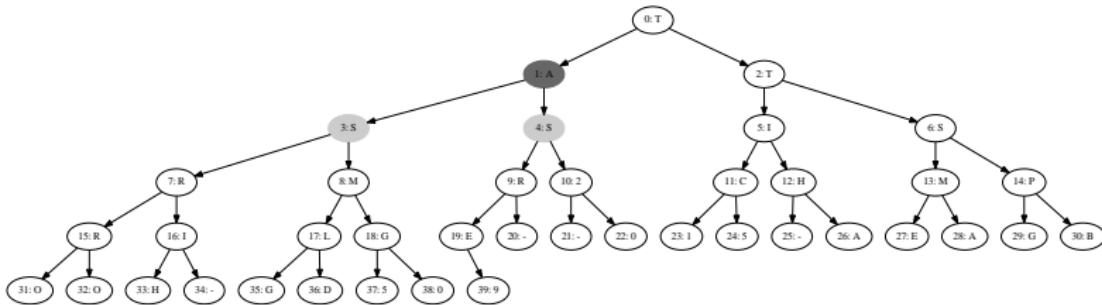


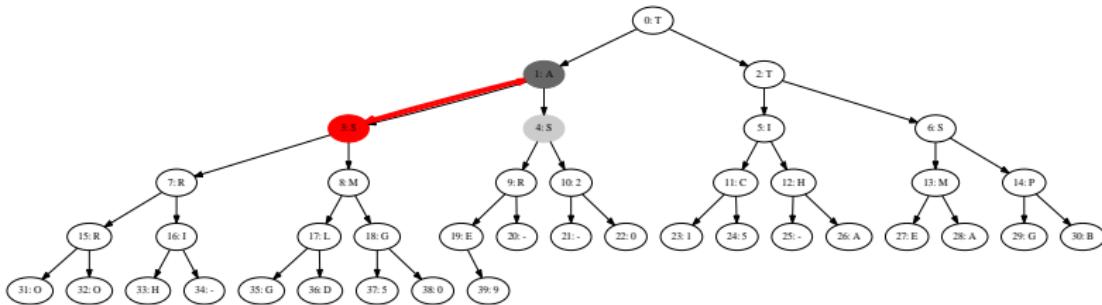
Running heapify on node 0 as part of the build heap (heap-up) process.
Heap size: 40 Array contents: ATTSSSISRMR2CHMPRLGE-015-AEAGBOOH-GD509



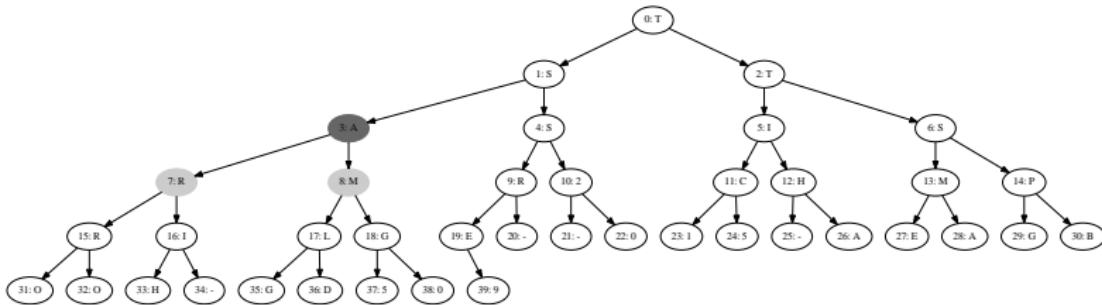
Largest of node 0 and its children is node 1.

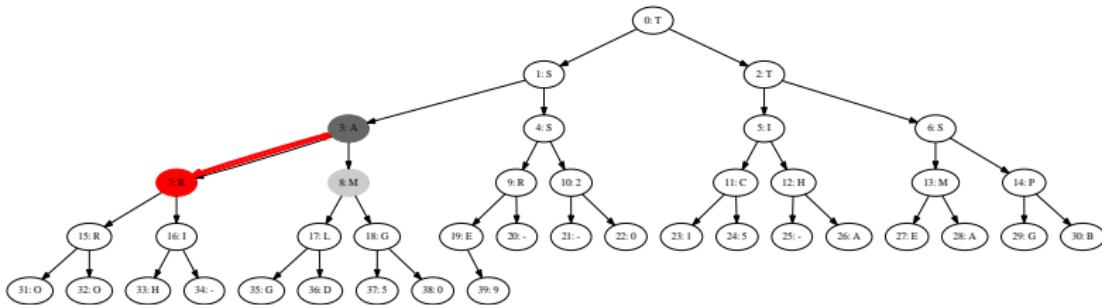
Root and max will be swapped and heapify will recurse on the new node 1.
 Heap size: 40 Array contents: ATTSSSISRMR2CHMPRLGE-015-AEAGBOOH-GD509





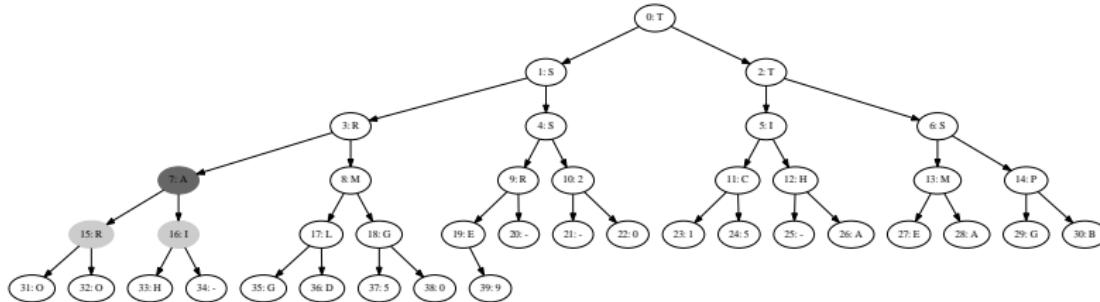
Largest of node 1 and its children is node 3.
 Root and max will be swapped and heapify will recurse on the new node 3.
 Heap size: 40 Array contents: TATSSISRMR2CHMPRLGE-015-AEAGBOOH-GD509



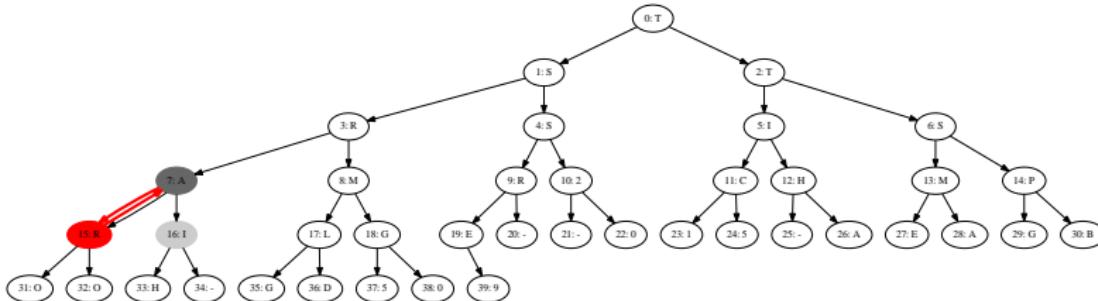


Largest of node 3 and its children is node 7.

Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 40 Array contents: TSTASISRMR2CHMPRLIGE-015-AEAGBOOH-GD509

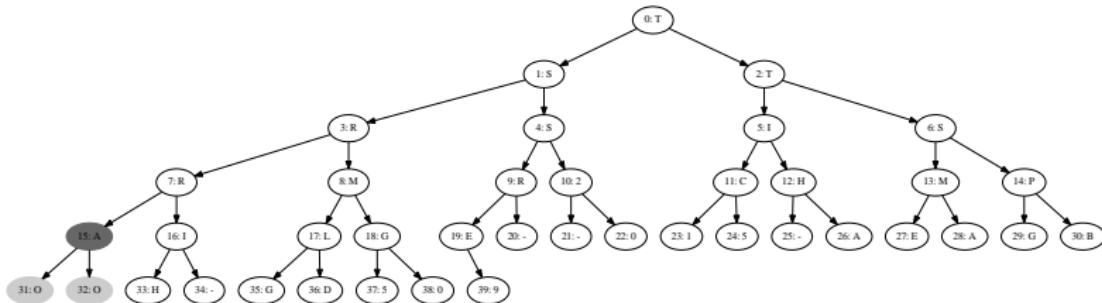


Running heapify on node 7.
Heap size: 40 Array contents: TSTRSIAMR2CHMPRLGE-015-AEAGBOOH-GD509

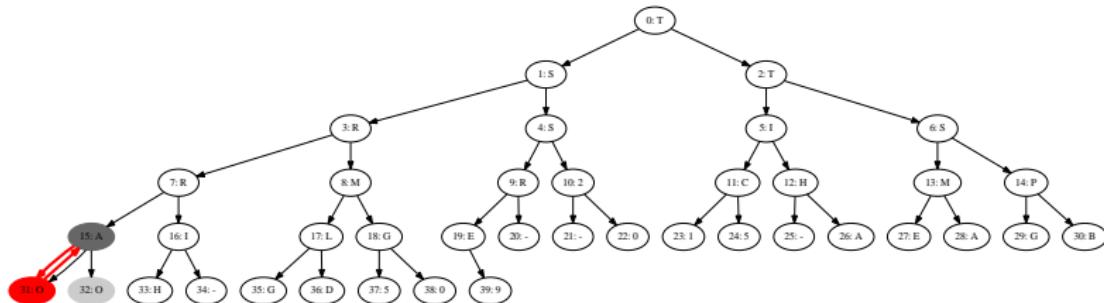


Largest of node 7 and its children is node 15.

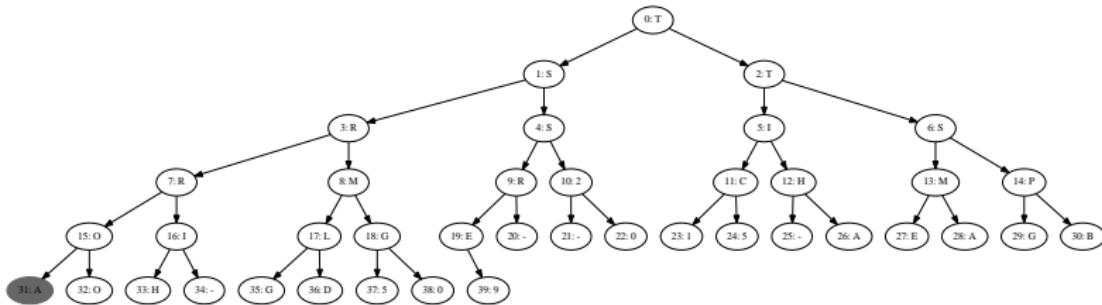
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 40 Array contents: TSTRSISAMR2CHMPRLGE-015-AEAGBOOH-GD509



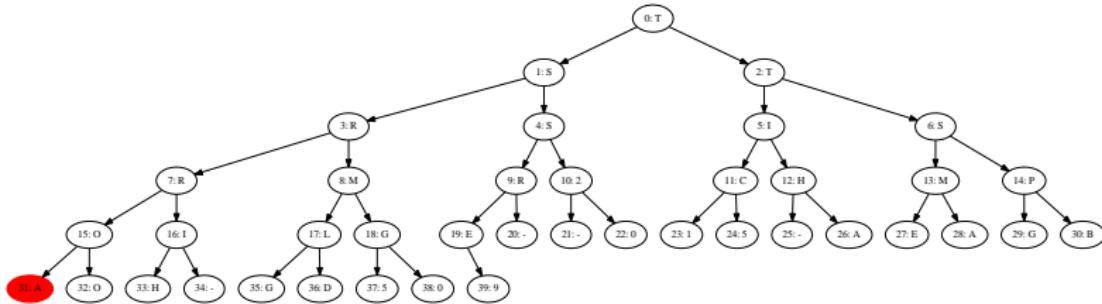
Running heapify on node 15.
Heap size: 40 Array contents: TSTRSISRMR2CHMPAILGE-015-AEAGBOOH-GD509



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



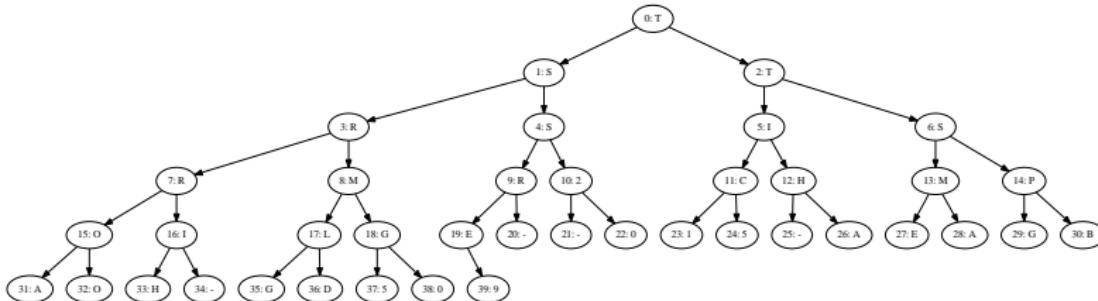
Running heapify on node 31.
Heap size: 40 Array contents: TSTRSISRMR2CHMPOILGE-015-AEAGBAOH-GD509



Largest of node 31 and its children is node 31.

No swap is necessary, heapify done.

Heap size: 40 Array contents: TSTRSISRMR2CHMPOLGE-015-AEAGBAOH-GD509

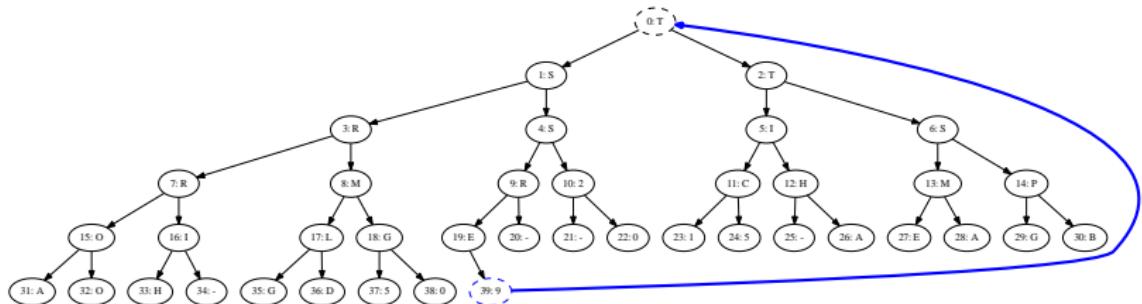


The array now satisfies the heap property.

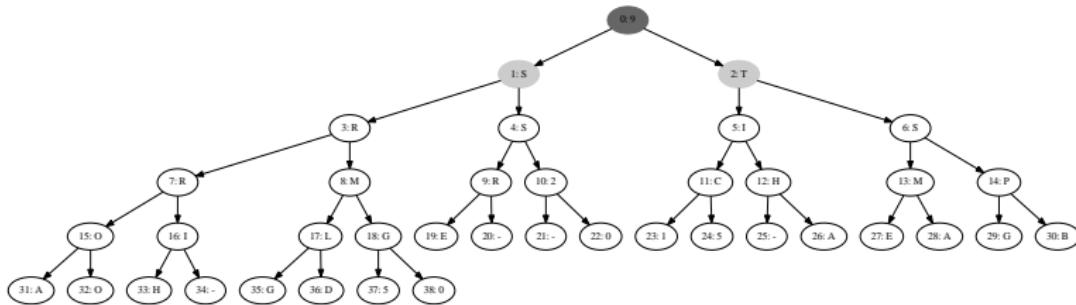
The heap will be emptied by repeatedly taking the root element

and moving it outside of the heap in the underlying array.

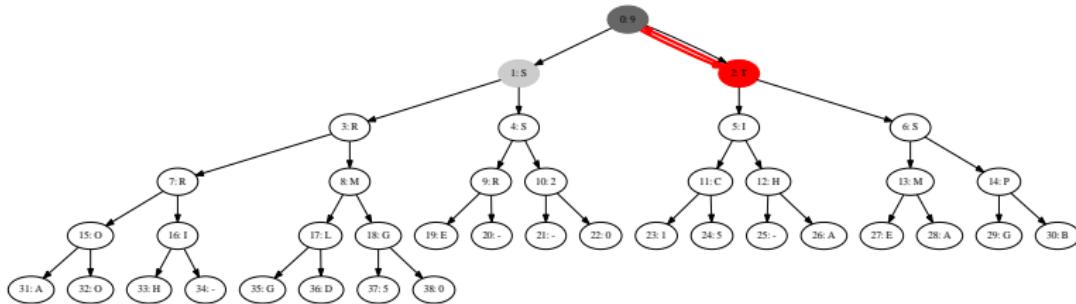
Heap size: 40 Array contents: T3TR5ISRM2CHMPOILGE-015-AEAGBAOH-GD509



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: T3TRSI5RMR2CHMPOILGE-015-AEAGBAOH-GD509

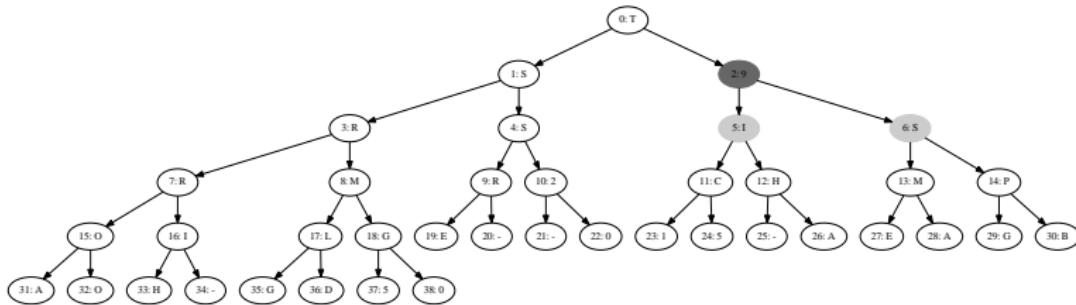


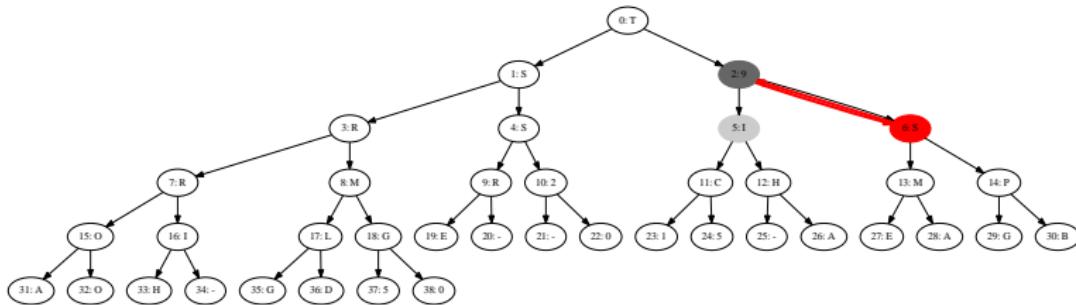
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 39 Array contents: 9STRSISRMR2CHMPOILGE-015-AEAGBAOH-GD50T



Largest of node 0 and its children is node 2.

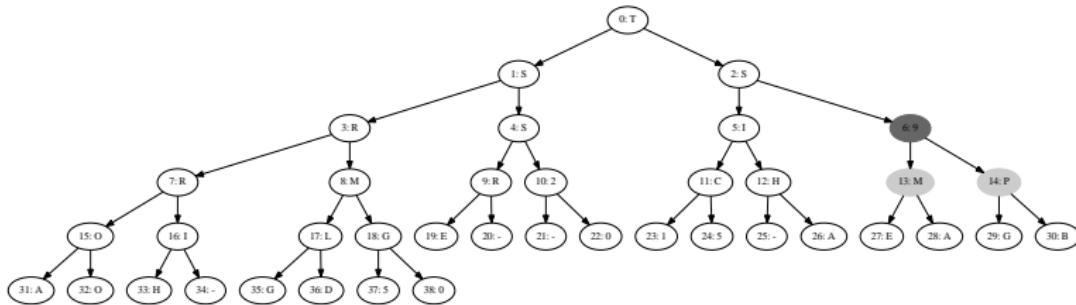
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 39 Array contents: 95TRSI5RMR2CHMPOILGE_015-AEAGBAOAH-GD50T



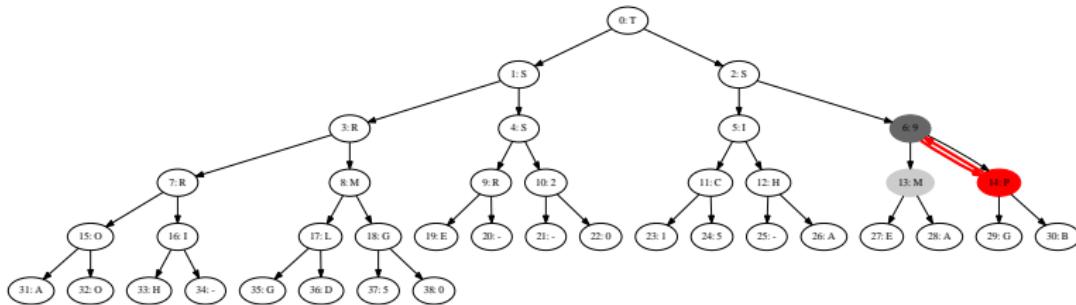


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 39 Array contents: TS9RSISRMK2CHMPOLGE-015-AEAGBAOH-GD50T

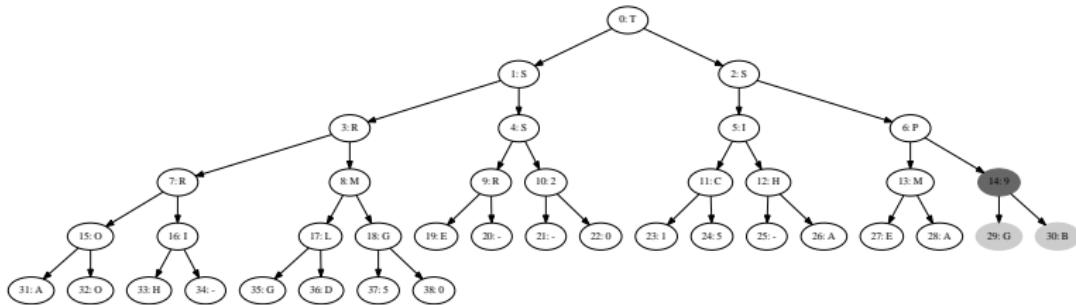


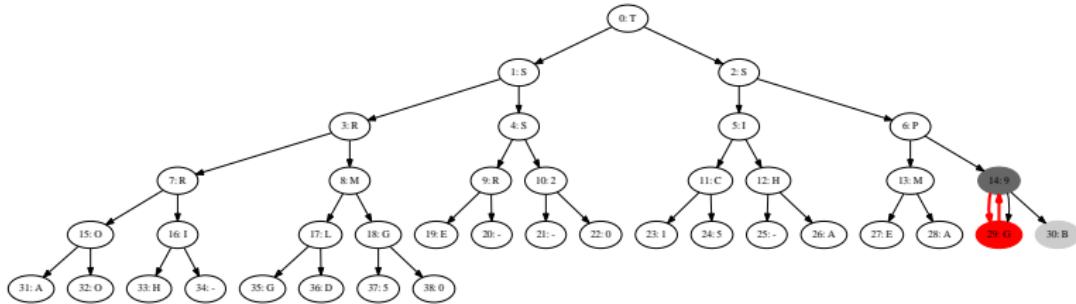
Running heapify on node 6.
Heap size: 39 Array contents: TSSRS19RMR2CHMPOLGE-015-AEAGBAOH-GD50T



Largest of node 6 and its children is node 14.

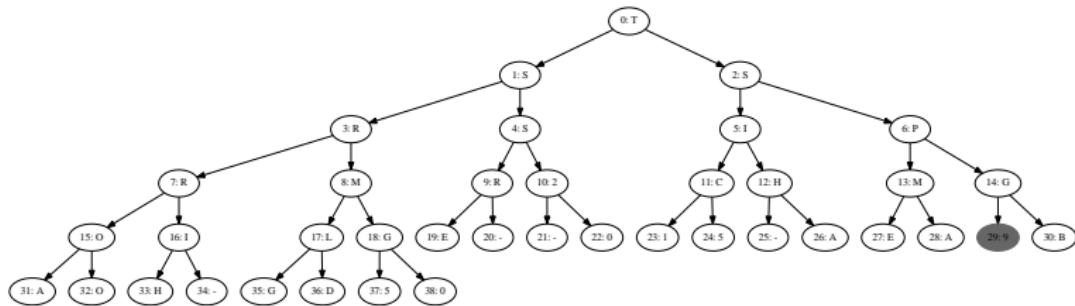
Root and max will be swapped and heapify will recurse on the new node 14.
Heap size: 39 Array contents: TSSRS19RMBC2CHMPOLGE-015-AEAGBAOH-GD50T



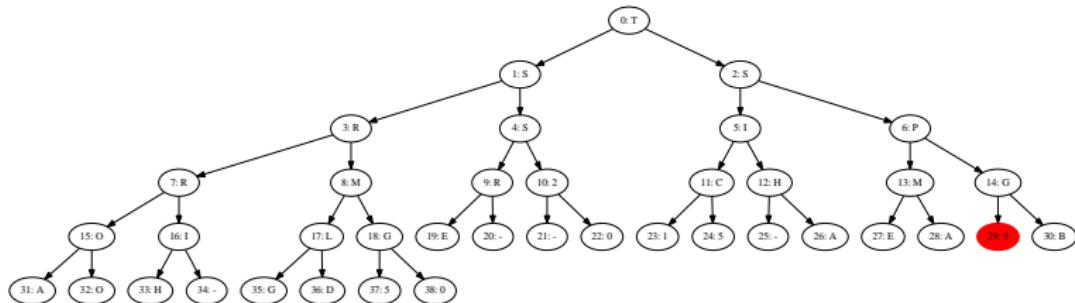


Largest of node 14 and its children is node 29.

Root and max will be swapped and heapify will recurse on the new node 29.
Heap size: 39 Array contents: TSSRSIPRMK2CHM90ILGE-015-AEAGBAOH-GD50T



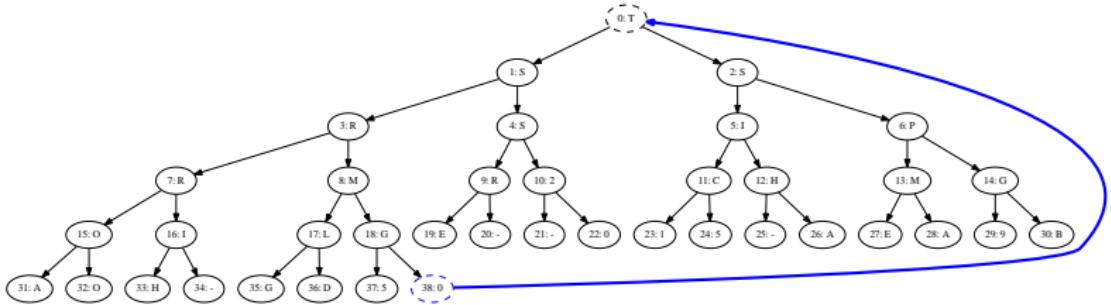
Running heapify on node 29.
Heap size: 39
Array contents: TSSRSIPMR2CHMGOILGE-015-AEA9BAOH-GD50T



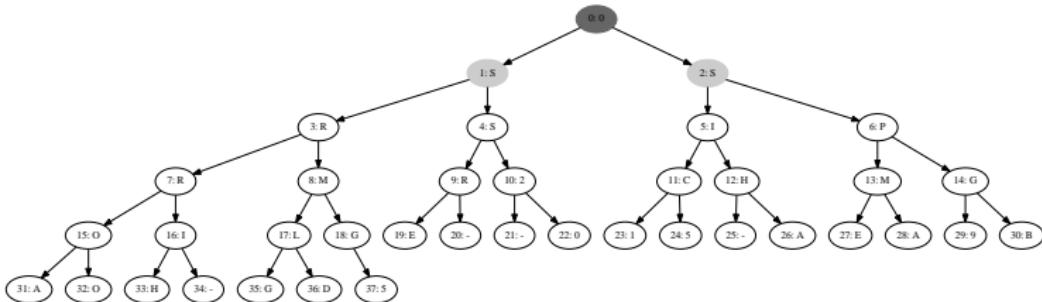
Largest of node 29 and its children is node 29.

No swap is necessary, heapify done.

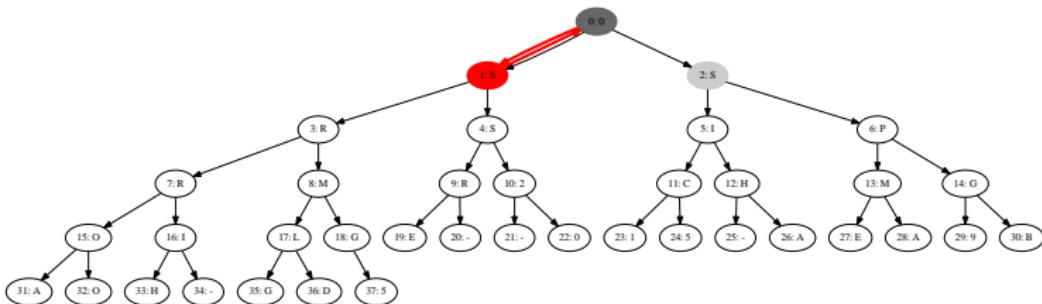
Heap size: 39 Array contents: TSSRSIPRMR2CHMGOILGE-015-AEA9BAOH-GD50T

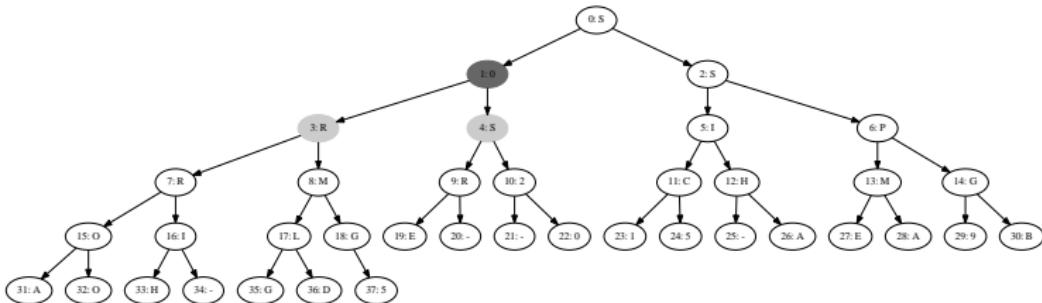


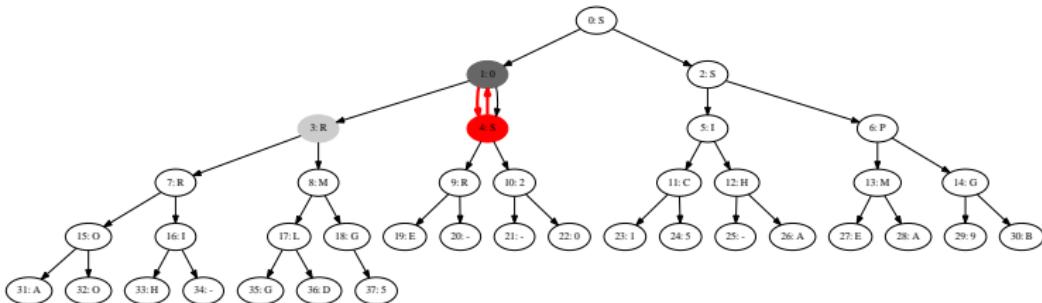
Removing root and moving it outside of the heap.
The last element takes its place and the heap size is decremented.
Heap size: 39 Array contents: TSSRSIPRMR2CHMIGOLGE-015-AEA9BAOH-GD50T



Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 38 Array contents: 0SSRSIPRMR2CHMGOILGE-015-AEA9BAOH-GD5TT

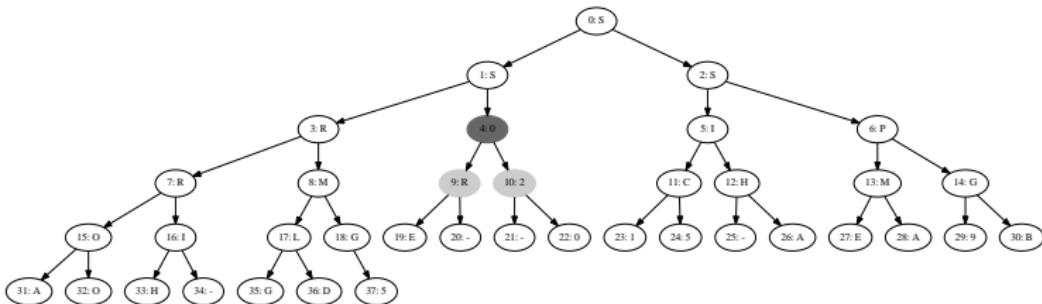




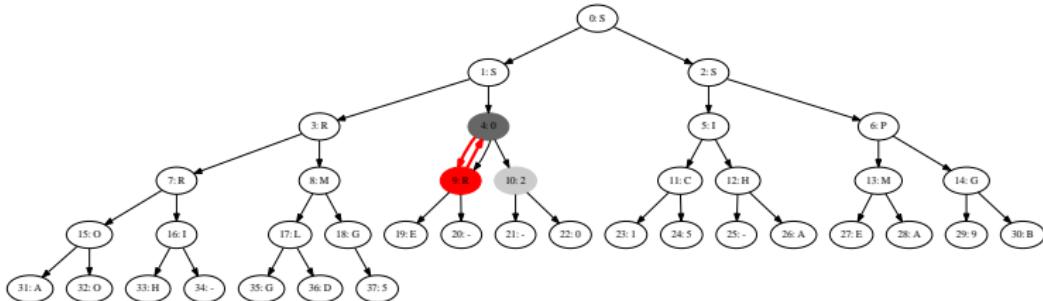


Largest of node 1 and its children is node 4.

Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 38 Array contents: S0SRSIPRMK2CHMGOILGE-015-AEA9BAOH-GD5TT

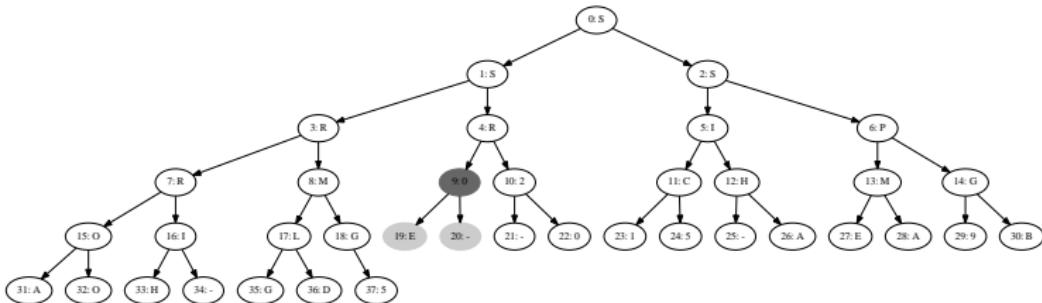


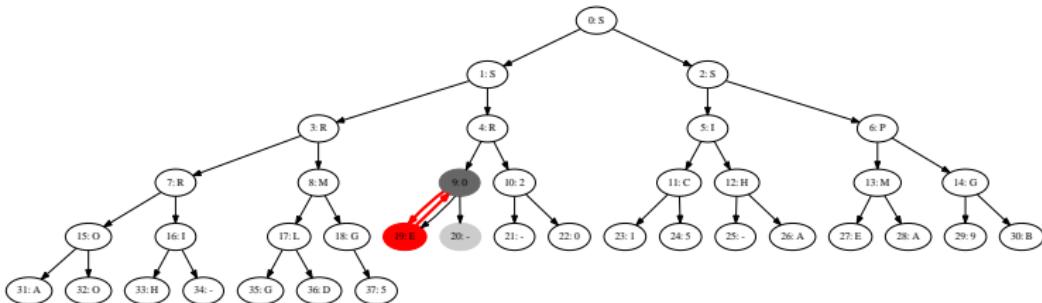
Running heapsify on node 4.
Heap size: 38 Array contents: SSSR0IPMR2CHMGOILGE-015-AEA9BAOH-GDSTT



Largest of nodes 4 and its children is node 2.

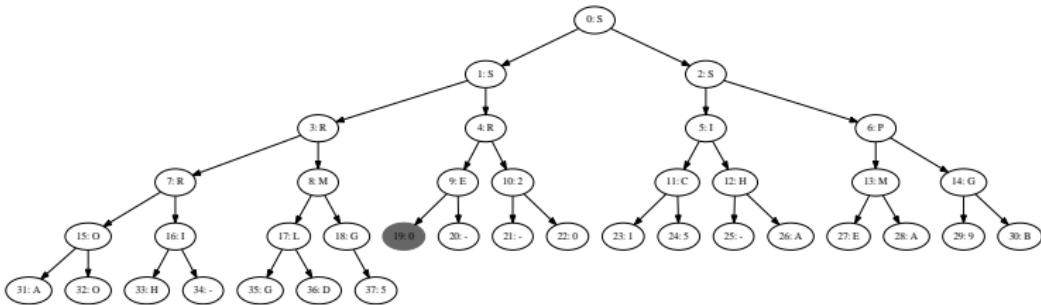
Root and max will be swapped and heapify will recurse on the new node 9.
Heap size: 38 Array contents: SSSR01PRMR2CHMGOILGE-015-AEA9BAOH-GD5TT



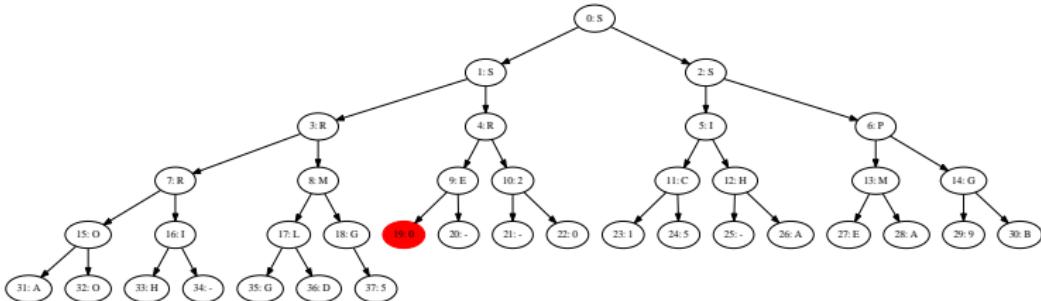


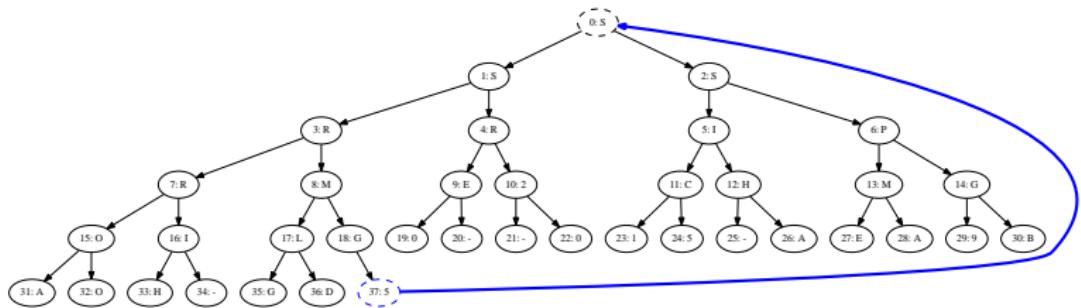
Largest of node 9 and its children is node 19.

Root and max will be swapped and heapify will recurse on the new node 19.
 Heap size: 38 Array contents: SSSRRIPRM012CHMGOILGB-015-AEA9BAOH-GD5TT



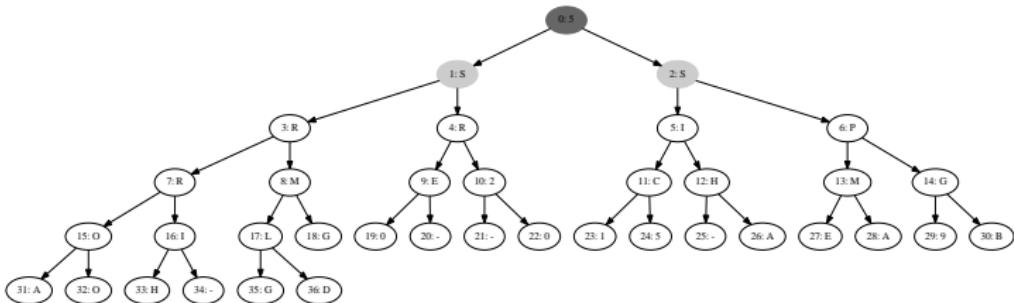
Running heapify on node 19.
Heap size: 38 Array contents: SSSRRIPRME2CHMGOILG0-015-AEA9BAOH-GDSTT

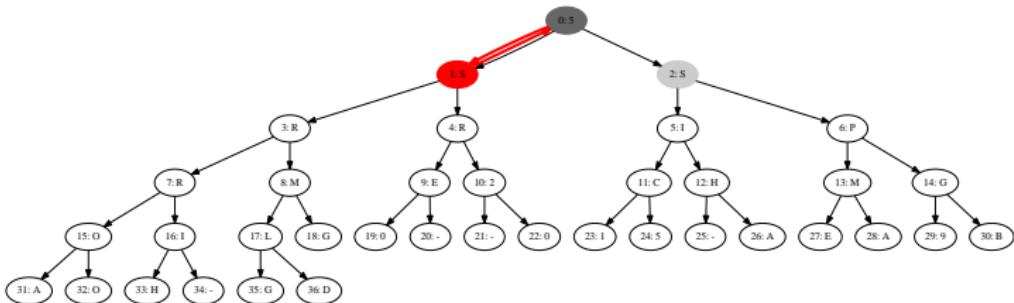




Removing root and moving it outside of the heap.

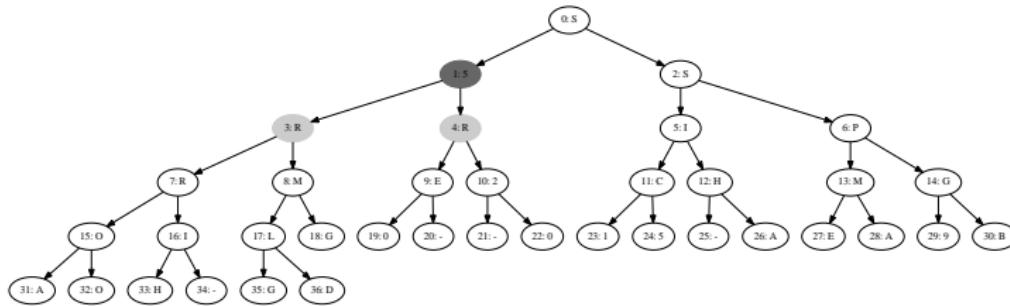
The last element takes its place and the heap size is decremented.
Heap size: 38 Array contents: SSSRRIPRME2CHMG0ILG0-015-AEA9BAOH-GD5TT



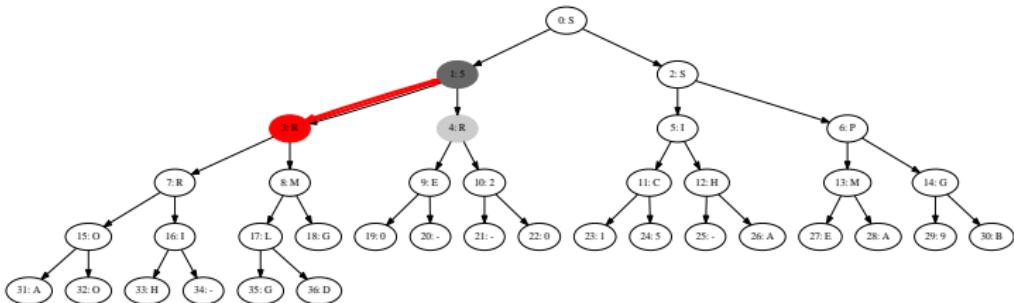


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 37 Array contents: 5SSRRIPRME2CHMGOILG0-015-AEA9BAOH-GDSTT

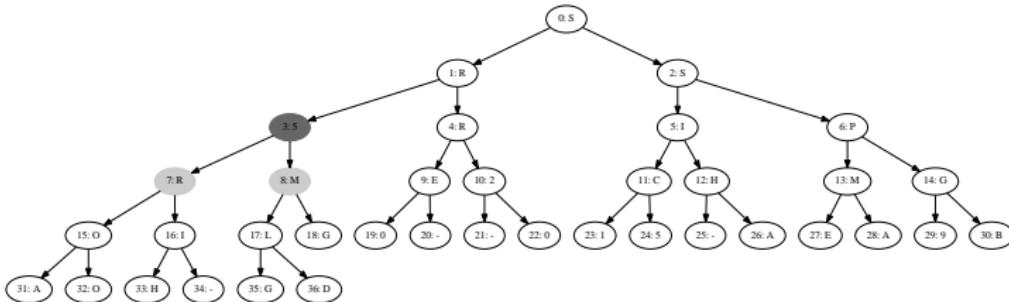


Running heapify on node 1.
Heap size: 37 Array contents: 55SR1PRMIE2CHMGOILG0-015-AEA9BAOH-GD5TT

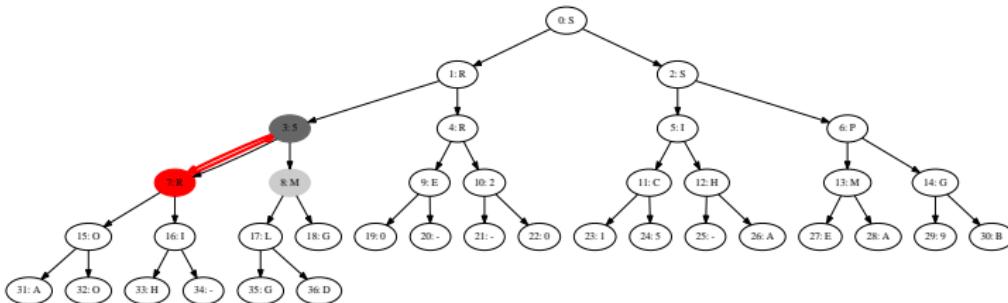


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
 Heap size: 37 Array contents: S5SRRIPRME2CHMGOILG0-015-AEA9BAOH-GDSTT

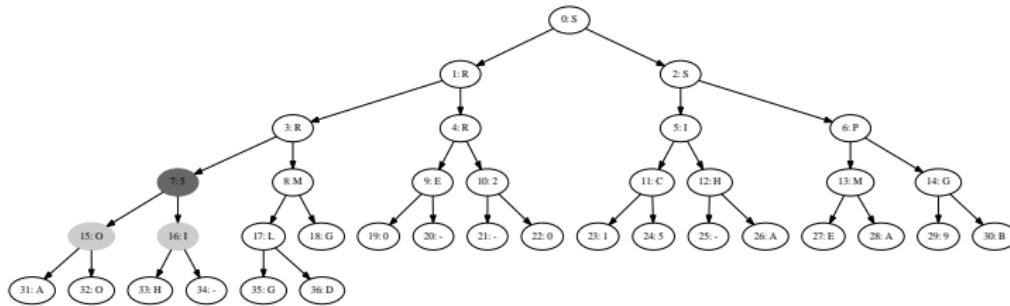


Running heapify on node 3.
Heap size: 37
Heap contents: SRS5RIPRME2CHMGOILG0-015-AEA9BAOH-GDSTT

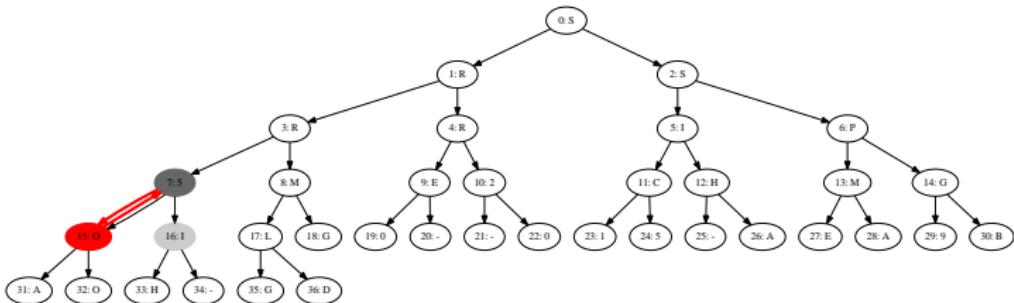


Largest of node 3 and its children is node 7.

Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 37 Array contents: SRS5RIPRME2CHMGOILG0-015-AEA9BAOH-GDSTT

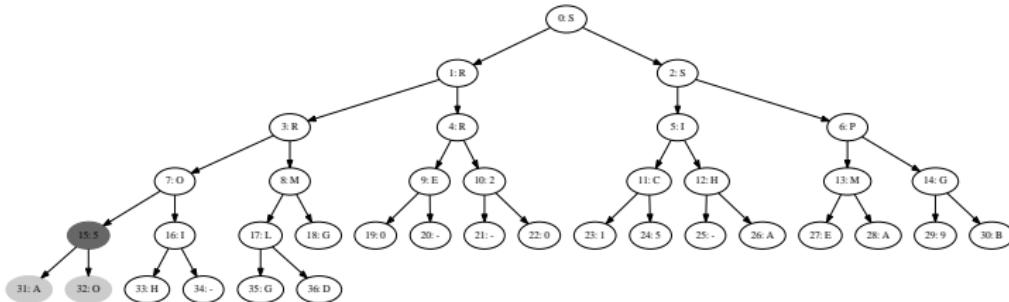


Running heapify on node 7.
Heap size: 37 Array contents: SRSRRIP5MIE2CHMGOILG0-015-AEA9BAOH-GD5TT

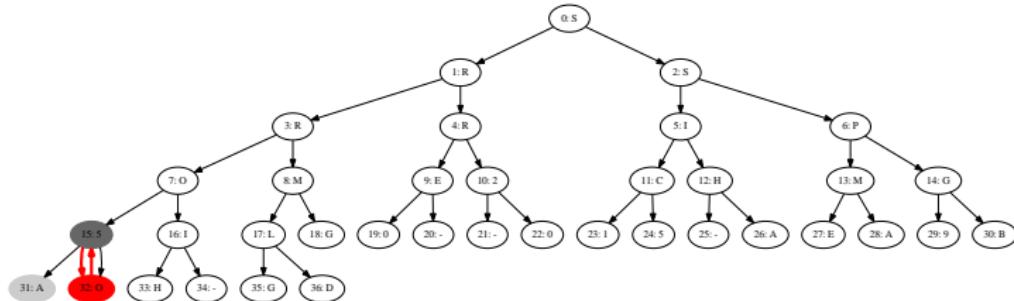


Largest of node 7 and its children is node 15.

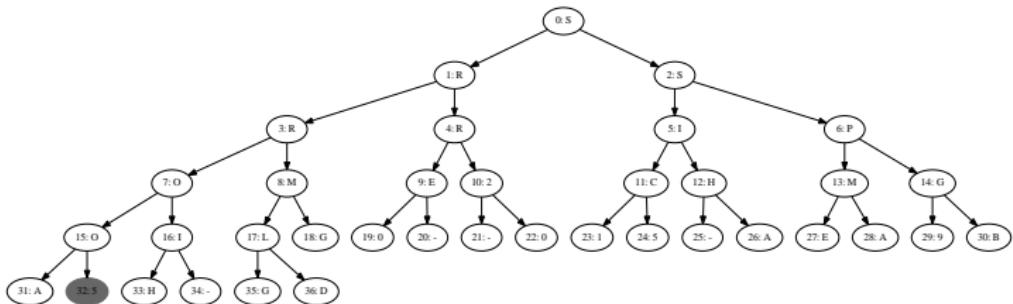
Root and max will be swapped and heapify will recurse on the new node 15.
 Heap size: 37 Array contents: SRSSRRIP5ME2CHMGOILG0-015-AEA9BAOH-GDSTT



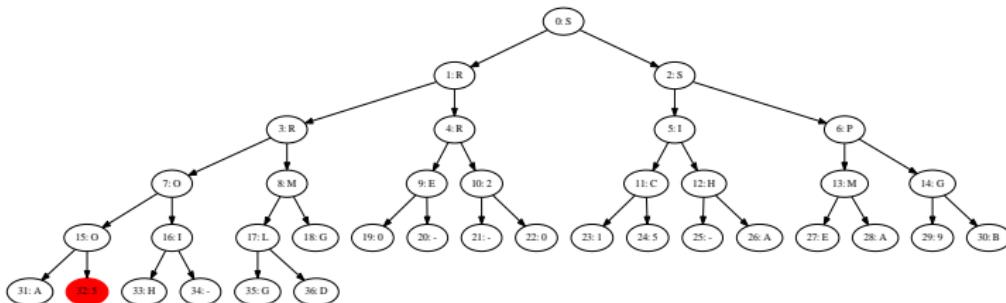
Running heapify on node 15.
Heap size: 37 Array contents: SRSRRIPOME2CHMGSILG0-015-AEA9BAOH-GDSTT



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: SRSRRIPOME2CHMG5ILG0-015-AEA9BAOH-GDSTT



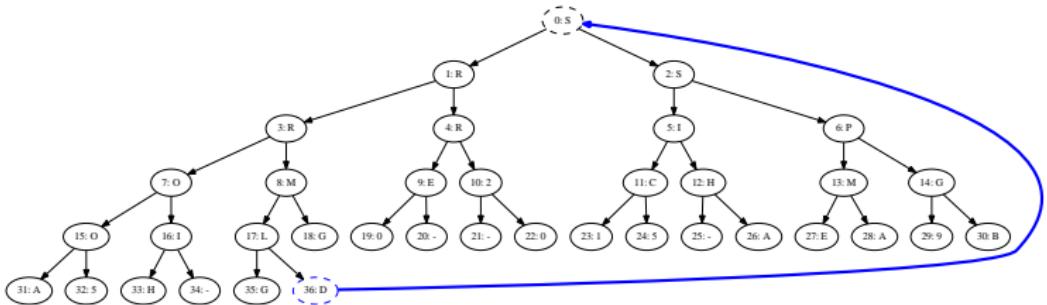
Running heapify on node 32.
Heap size: 37 Array contents: SRSRRIPOME2CHMGOILG0-015-AEA9BA5H-GDSTT



Largest of node 32 and its children is node 32.

No swap is necessary, heapify done.

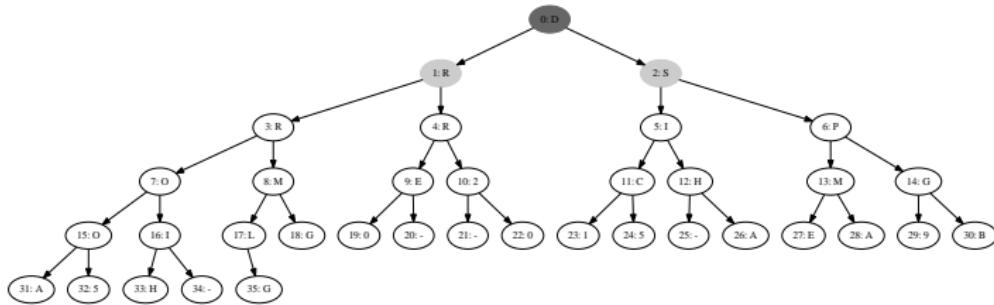
Heap size: 37 Array contents: SRSRRIPOME2CHMG0ILG0-015-AEA9BASH-GDSTT



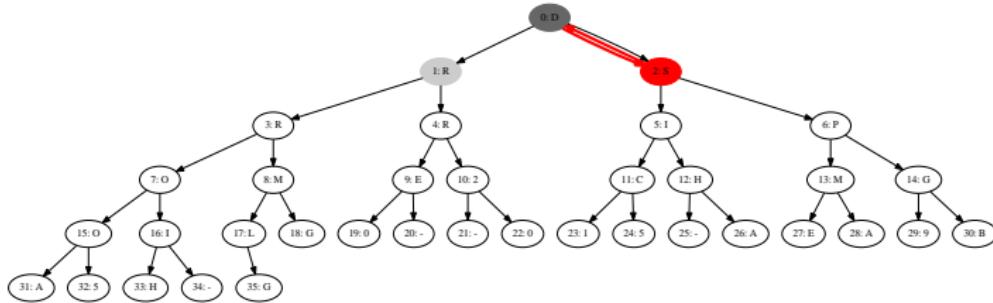
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 37 Array contents: SRSRRIPOME2CHMG0ILG0-015-AEA9BASH-GDSTT

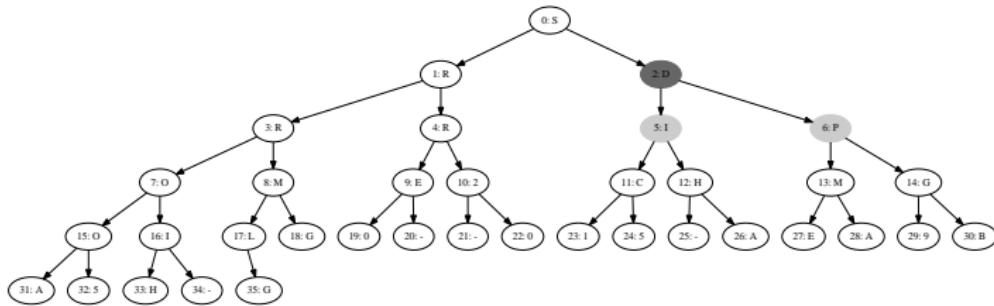


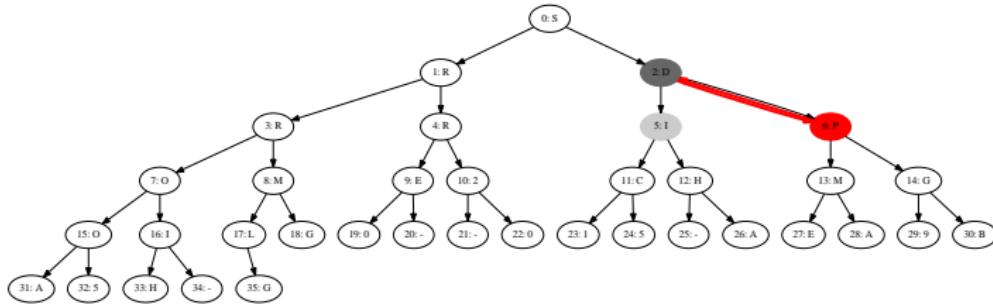
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 36 Array contents: DRSRRIPOME2CHMGOILG0-015-AEA9BA5H-GSSTT



Largest of node 0 and its children is node 2.

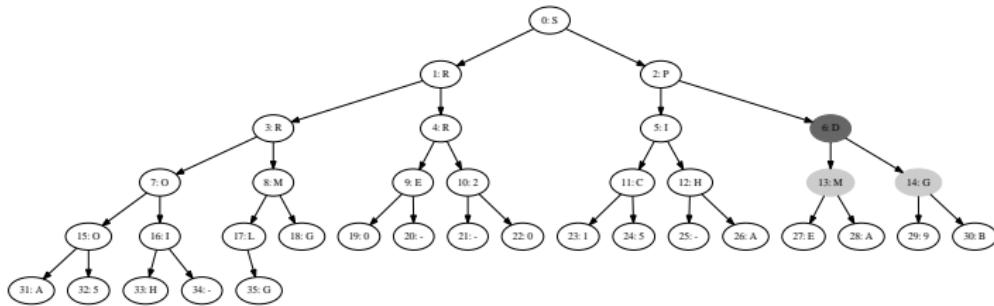
Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 36 Array contents: DRSSRRIPOME2CHMGOILG0-015-AEA9BA5H-GSSTT



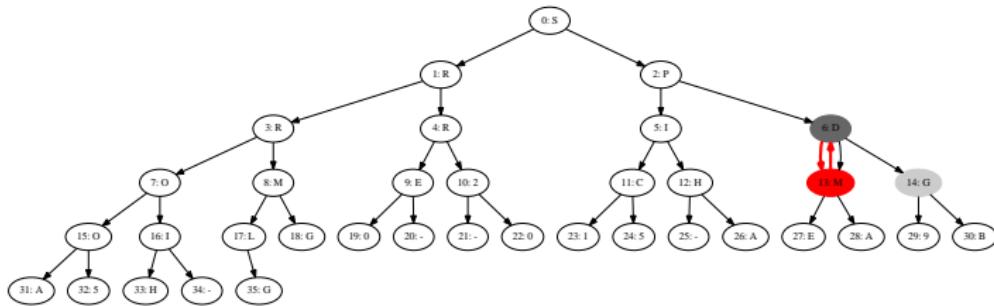


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 36 Amay contents: SRDRRIPOME2CHMG0ILG0-015-AEA9BAS9-GSSTT

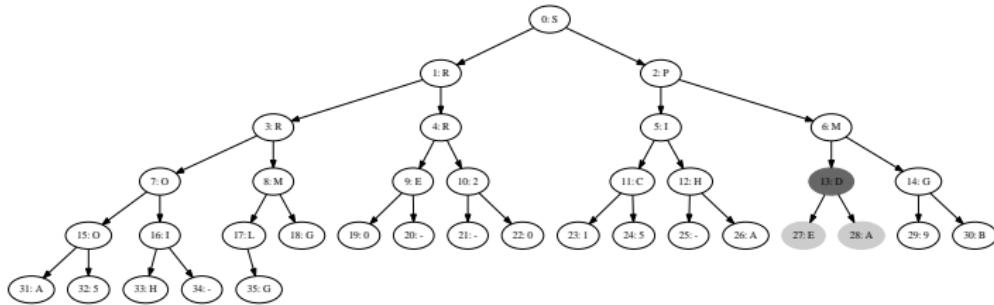


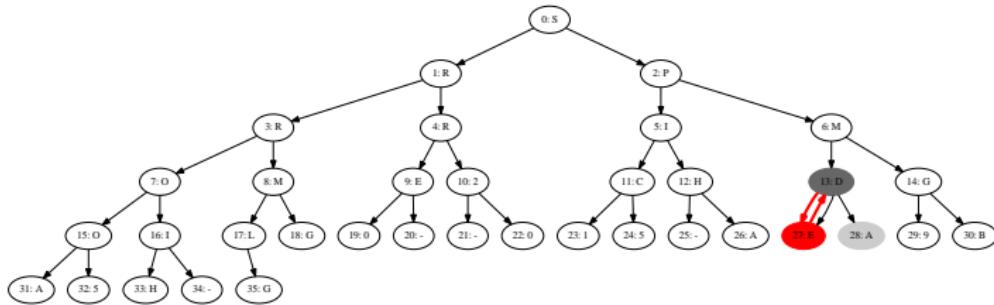
Running heapify on node 6.
Heap size: 36 Array contents: SRPRRIDOME2CHMGOILG0-015-AEA9BA5H-GSSTT



Largest of node 6 and its children is node 13.

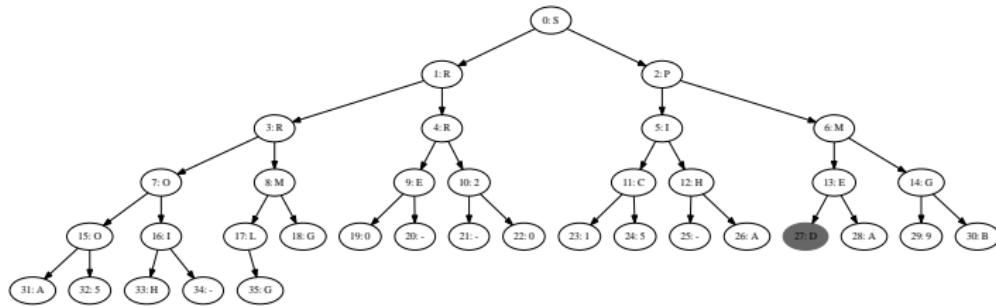
Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 36 Array contents: SRP~~R~~RIDOME2CHMGOILG0-015-AEA9BA5H-GISTT

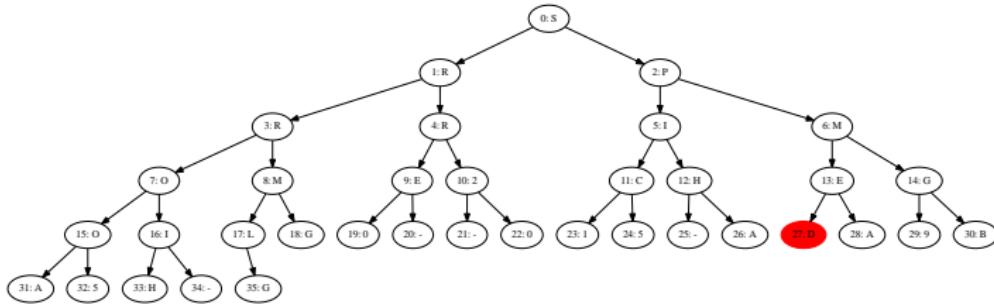




Largest of node 13 and its children is node 27

Root and max will be swapped and heapify will recurse on the new node 27.
Heap size: 36 Array contents: SRP RRI MOME2CHD GOIL G0-015-AEA9BA5H-GSSTT

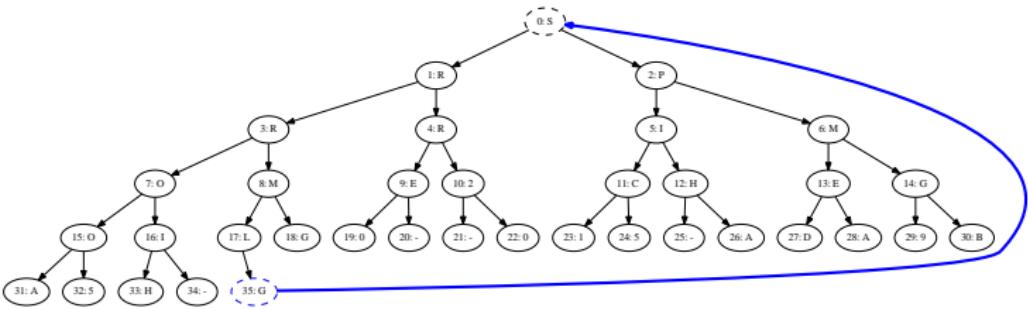




Largest of node 27 and its children is node 27.

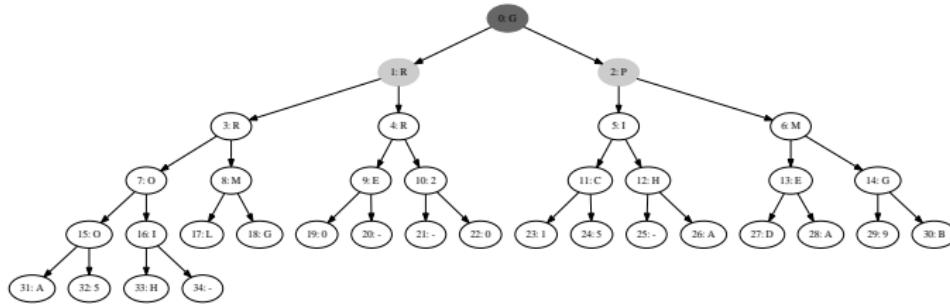
No swap is necessary, heapify done.

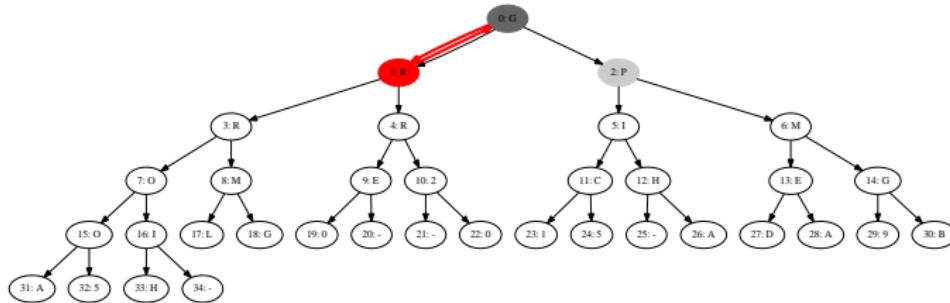
Heap size: 36 Array contents: SRPRRIMOMEENCHEGOILG0-015-ADA9BASH-GSSTT



Removing root and moving it outside of the heap.

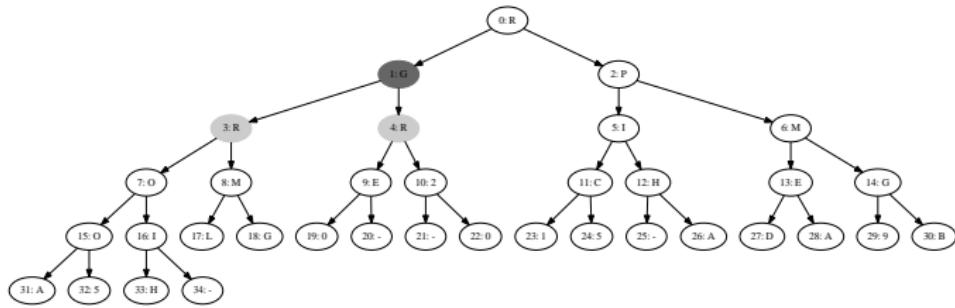
The last element takes its place and the heap size is decremented.
Heap size: 36 Array contents: SRPRRIMOME2CHEGOILG0-015-ADA9BA5H-GSSTT



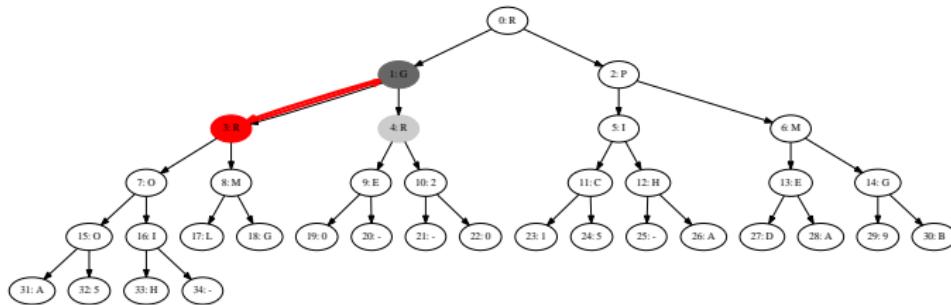


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
 Heap size: 35 Amay contents: GRPRRIMOME2CHEGOHLG0-015-ADA9BASH-SSSTT

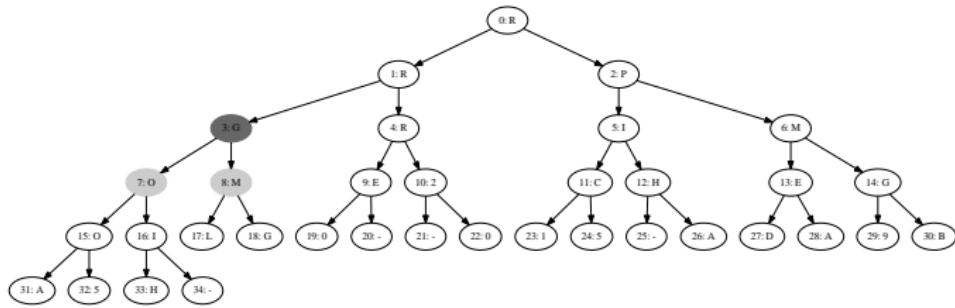


Running heapify on node 1.
Heap size: 35 Array contents: RGPRRIMOME2CHEGOILG0-015-ADA9BA5H-SSSTT

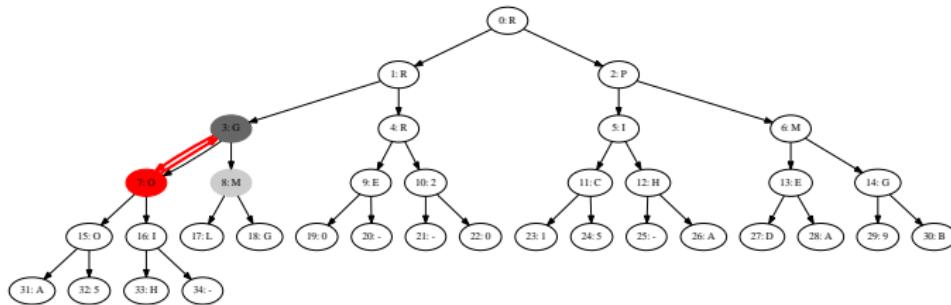


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 35 Array contents: RGPRRIMOMIE2CHEGOILG0-015-ADA9BA5H-SSSTT

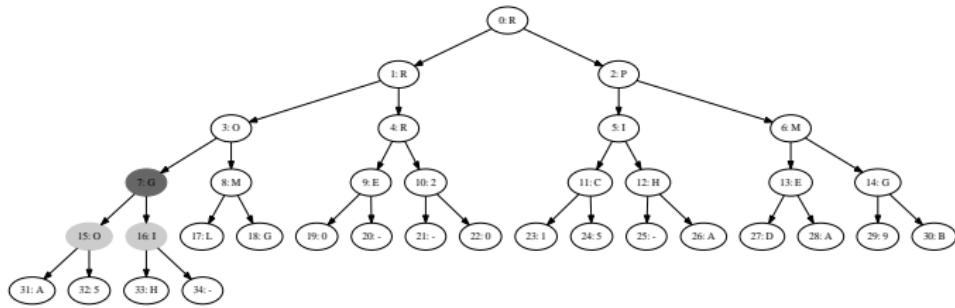


Running heapify on node 3.
Heap size: 35 Array contents: RRPGRIMOME2CHEGOILG0-015-ADA9BA5H-SSSTT

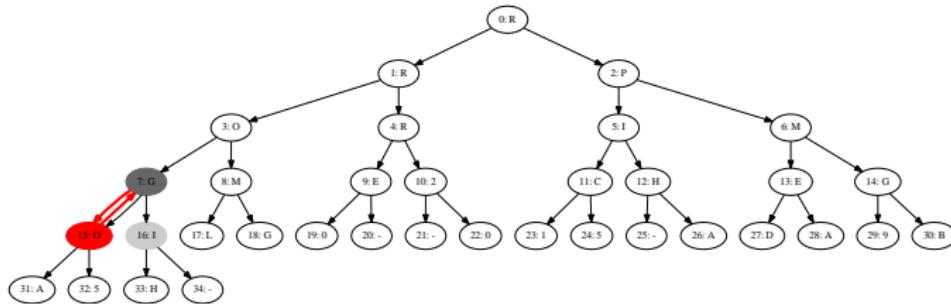


Largest of node 3 and its children is node 7.

Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 35 Array contents: RRPGRIMOMIE2CHEGOILG0-015-ADA9BA5H-SSSTT

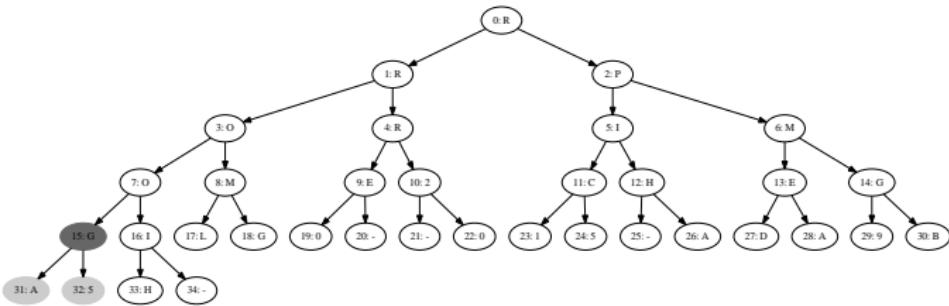


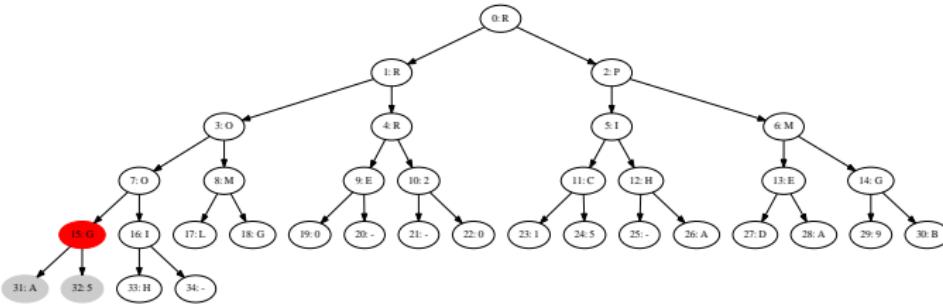
Running heapify on node 7.
Heap size: 35 Array contents: RRPORIMGME2CHEGOILG0-015-ADA9BA5H-SSSTT

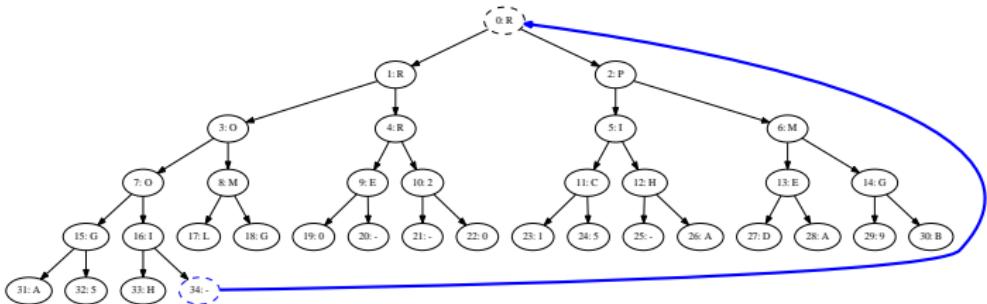


Largest of node 7 and its children is node 15.

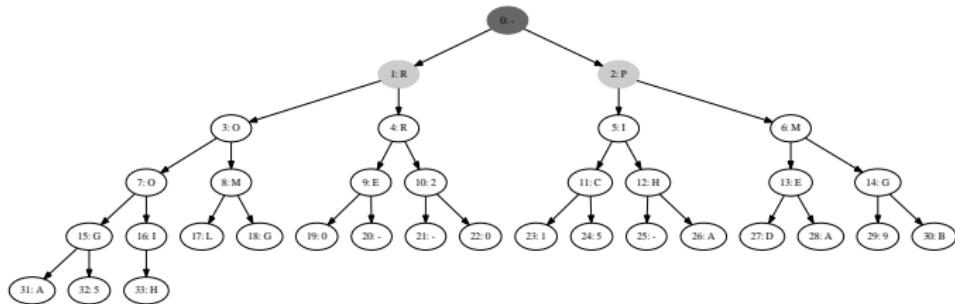
Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 35 Array contents: RRPOIRIMGME2CHEGOILG0-015-ADA9BASH-SSSTT



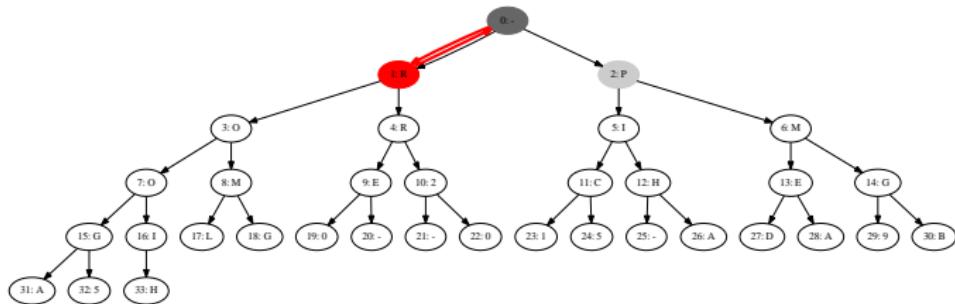




Removing root and moving it outside of the heap.
 The last element takes its place and the heap size is decremented.
 Heap size: 35 Amay contents: RRPORTIMOME2CHEGGILG0-015-ADA9BASH-SSSTT

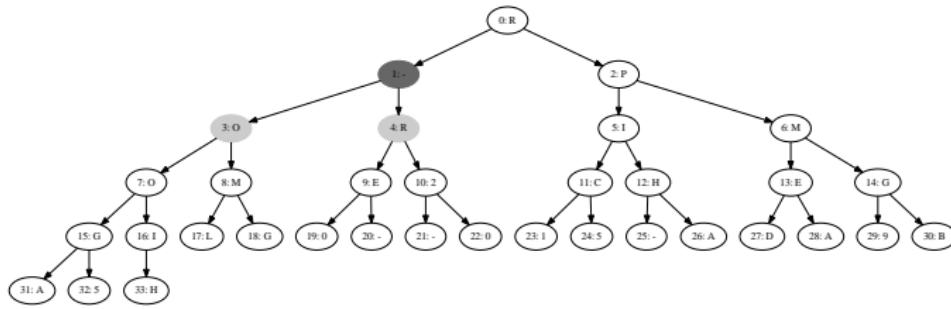


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 34 Array contents: -RPORIMOME2CHEGGILG0-015-ADA9BA5HRSSSTT

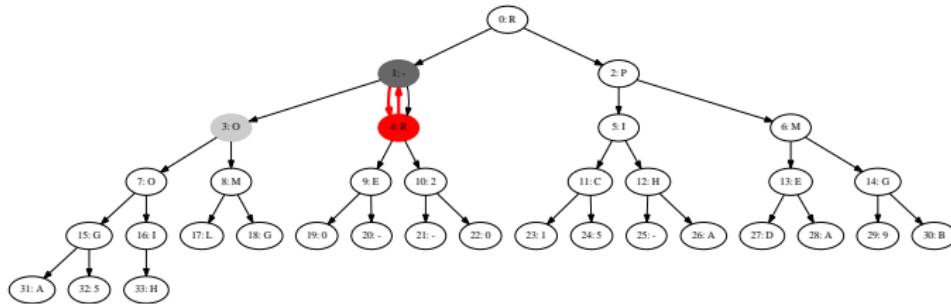


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 34 Amay contents: -RPORIMOME2CHEGGILG0-015-ADA9BASHRSSSTT

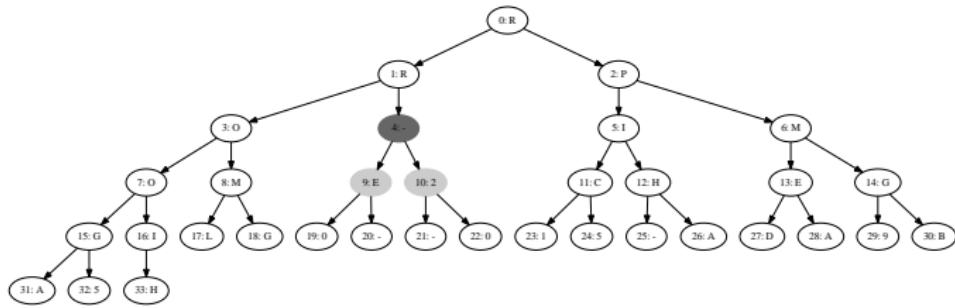


Running heapify on node 1.
Heap size: 34 Array contents: R-PORIMOME2CHEGGILGO-015-ADA9BASHRSSSTT

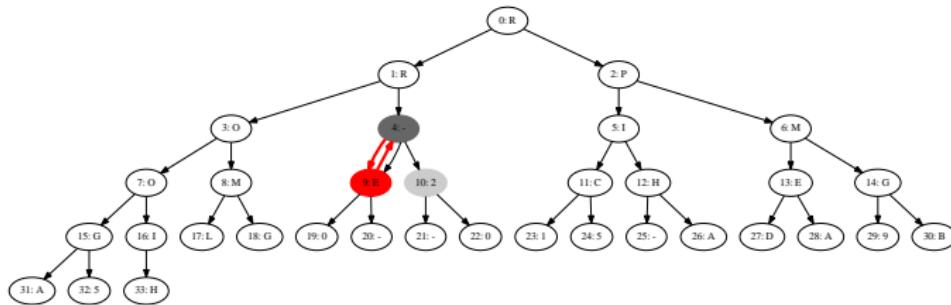


Largest of node 1 and its children is node 4.

Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 34 Array contents: R-PORIMOME2CHEGGILG0-015-ADA9BA5HRS5S5TT

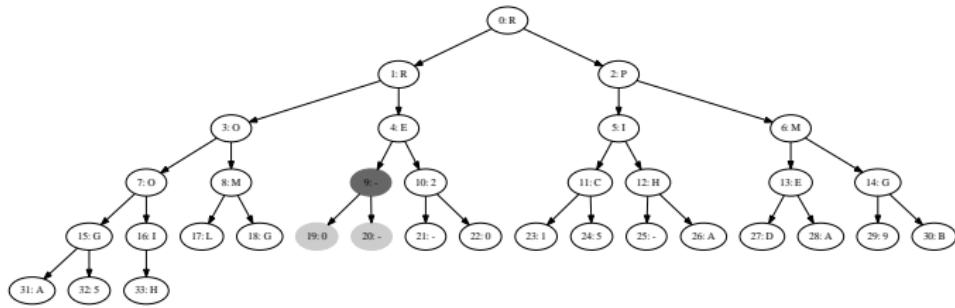


Running heapify on node 4.
Heap size: 34 Array contents: RRPPO-IMOME2CHEGGILGO-015-ADA9BA5HRSSSTT

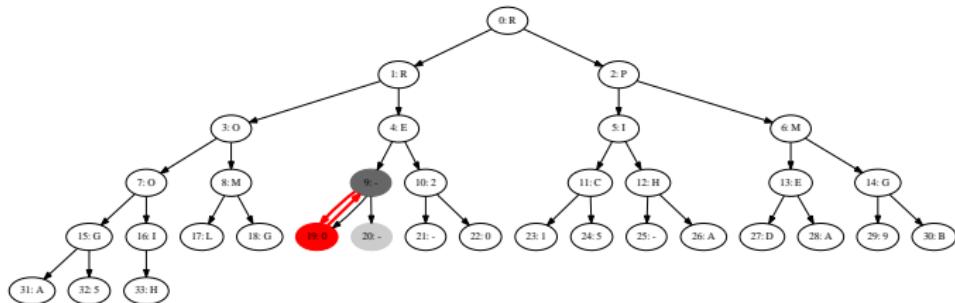


Largest of node 4 and its children is node 9.

Root and max will be swapped and heapify will recurse on the new node 9.
Heap size: 34 Array contents: RRPO-IMOME2CHEGGILG0-015-ADA9BASHRSSSTT



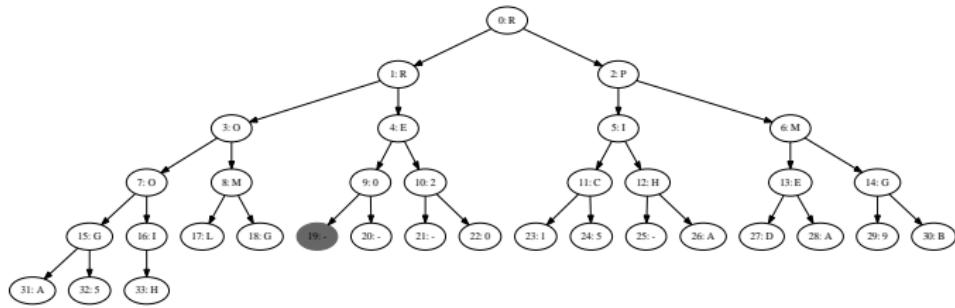
Running heapify on node 9.
Heap size: 34 Array contents: RRPPOEIMOM-2CHEGGILGO-015-ADA9BA5HRS5SSTT

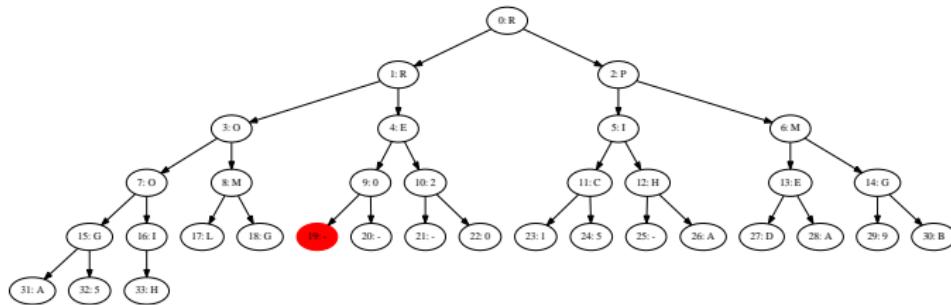


Largest of node 9 and its children is node 19.

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

Heap size: 34 Amay contents: RRPPOEIMOM-2CHELLGILG0-015-ADA9BASHRSSSTT

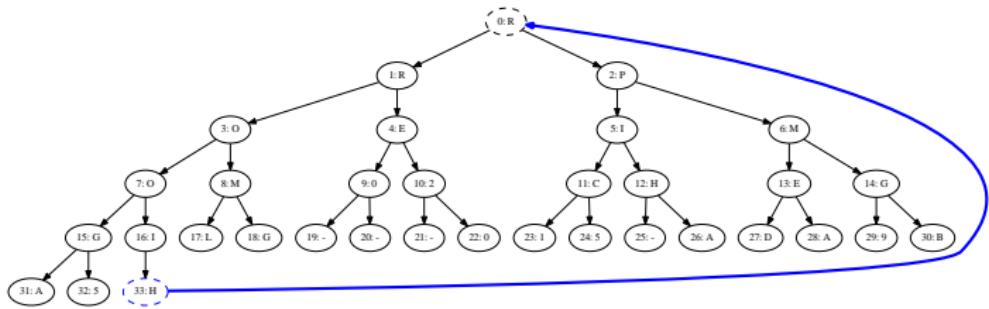




Largest of node 19 and its children is node 19.

No swap is necessary, heapify done.

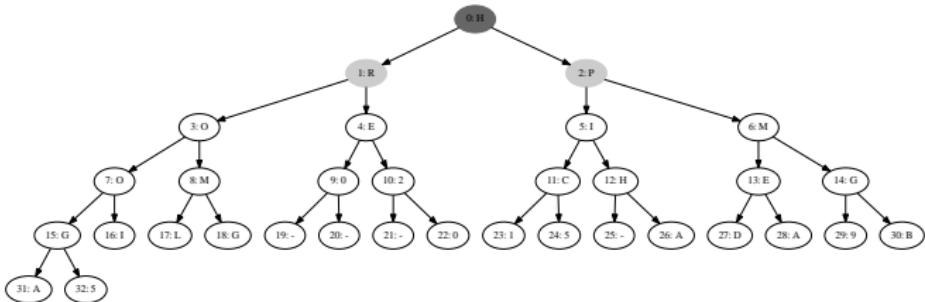
Heap size: 34 Array contents: RRPOEIMOM02CHEGGILG--015-ADA9BASHR5SSTT



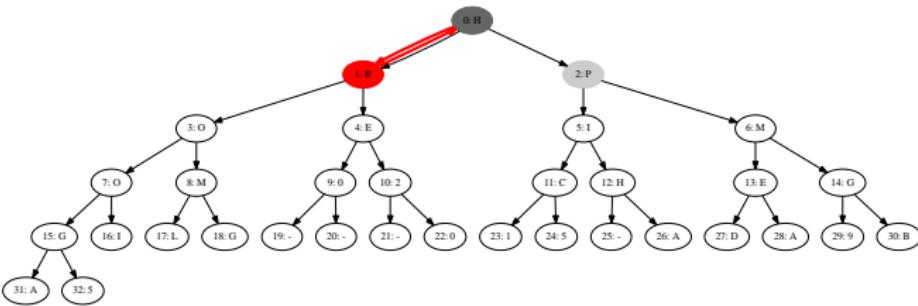
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 34 Amay contents: RRPPOEIMOM02CHEOGHILG—015-ADA9BASHRSSSTT

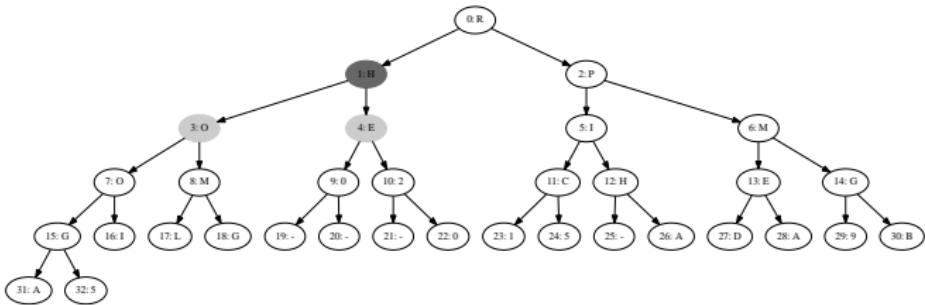


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 33 Array contents: HRP0EIMOM0I02CHEEGHLG—015-ADA9BA5RRSSSTT

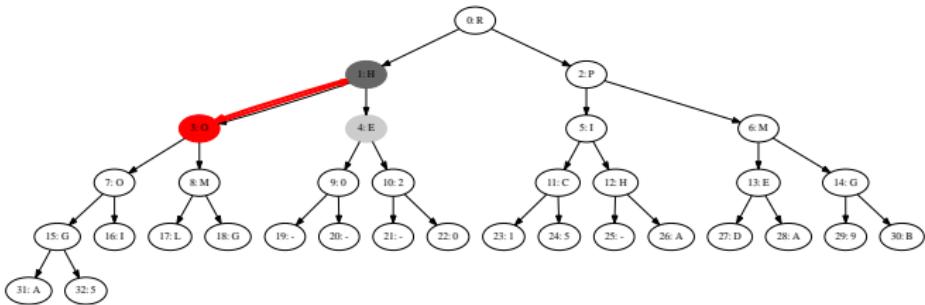


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 33 Array contents: HRPOEIMOM02CHEGGILG—015-ADA9BA5RRSSSTT

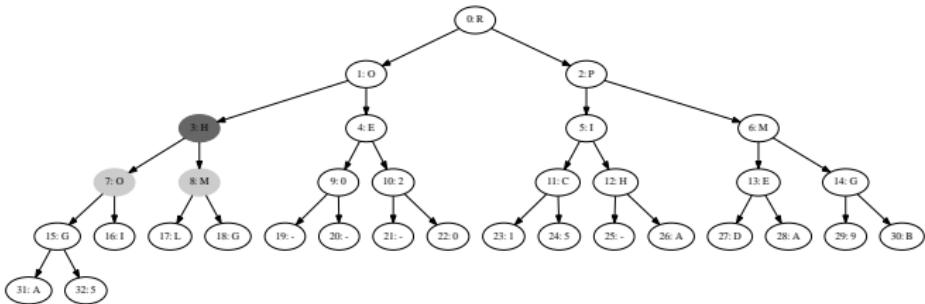


Running heapify on node 1.
Heap size: 33 Array contents: RHPOEIMOM02CHEGGHLG—015-ADA9BA5RRSSSTT

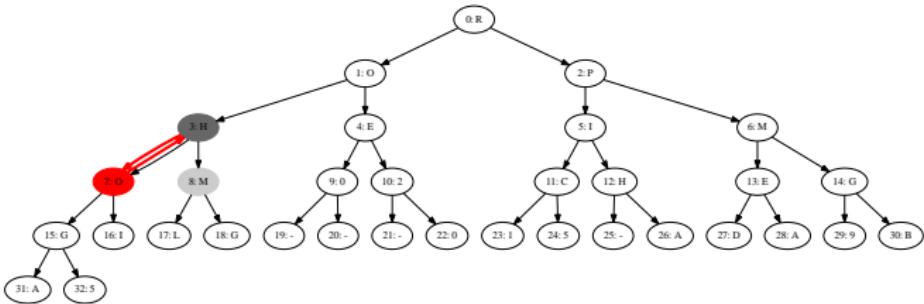


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 33 Array contents: RHPOEIMOMOJCHEOGHLG—015-ADA9BA5RRSSSTT

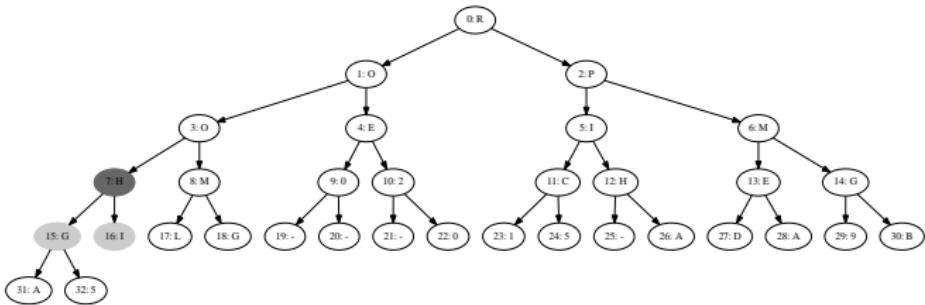


Running heapify on node 3.
Heap size: 33 Array contents: ROPHEIMOM02CHEGGHLG—015-ADA9BA5RRSSSTT

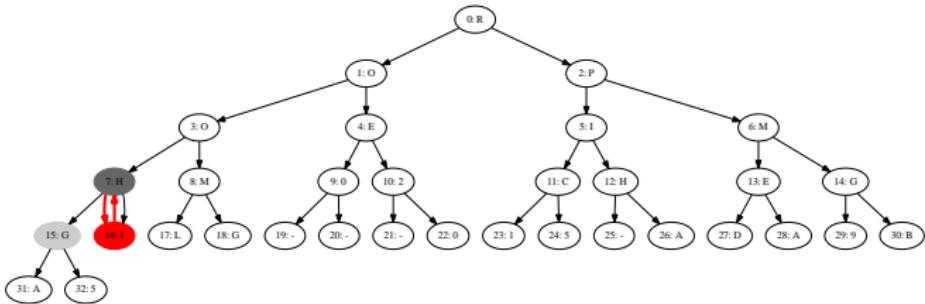


Largest of node 3 and its children is node 7.

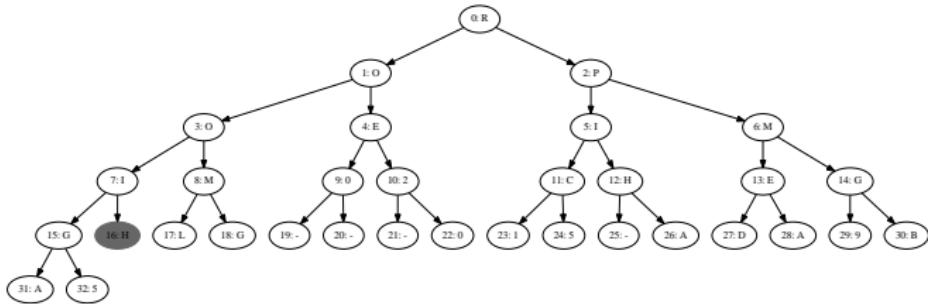
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 33 Array contents: ROPHEIMOMOJCHEOGHGLG—015-ADA9BA5RRSSSTT



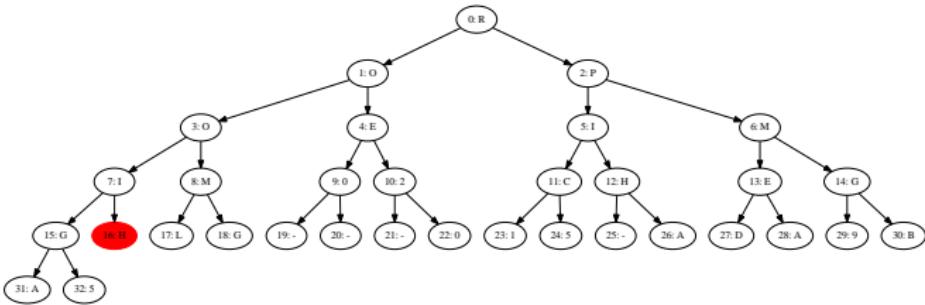
Running heapify on node 7.
Heap size: 33 Array contents: ROPOEIMHM02CHEGGHLG—015-ADA9BA5RRSSSTT



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: ROPOEIMHHM02CHEOGHLG—015-ADA9BA5RRSSSTT



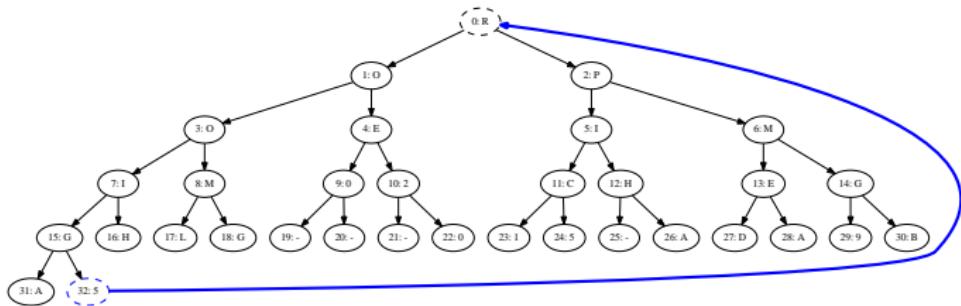
Heap size: 33 Array contents: ROPOEHMM02CHEGGHLG—015-ADA9BA5RRSSSTT



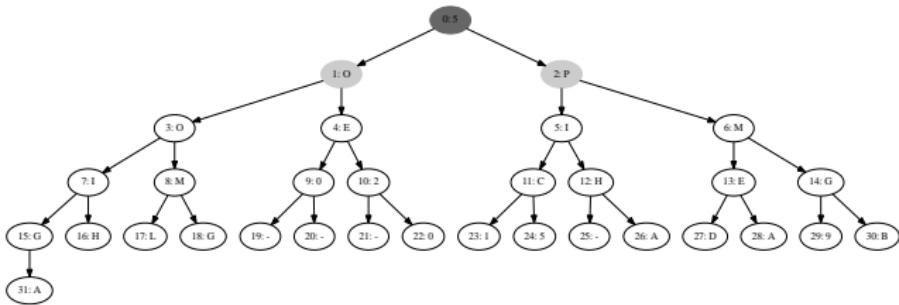
Largest of node 16 and its children is node 16.

No swap is necessary, heapify done.

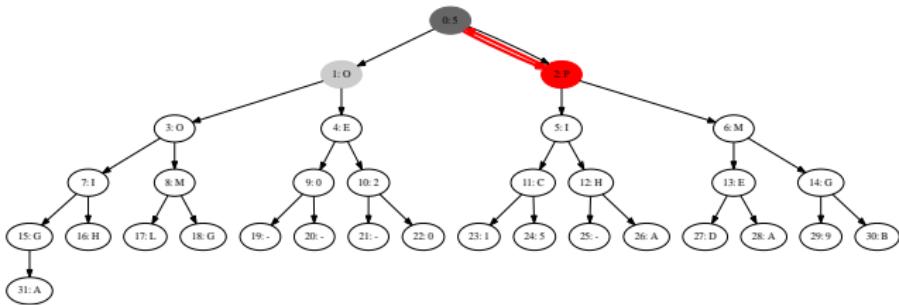
Heap size: 33 Array contents: ROPOEIMM02CHEGGHGLG—015-ADA9BA5RRSSSTT



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: ROPOEIMIM02CHEGGHLG---015-ADA9BA5RRSSSSTT

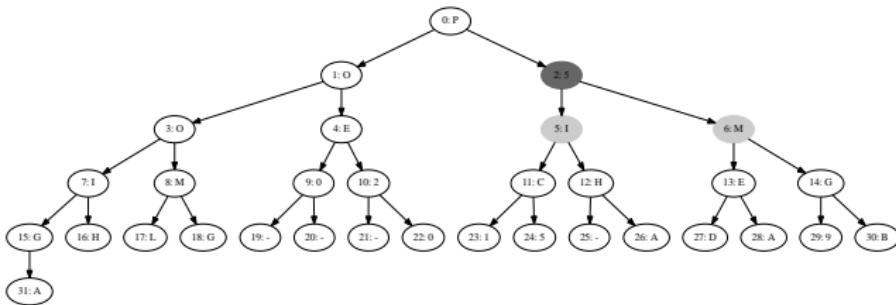


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 32 Array contents: 50POEIMM02CHE!GGHLG—015—ADA9BARRRSSSTT

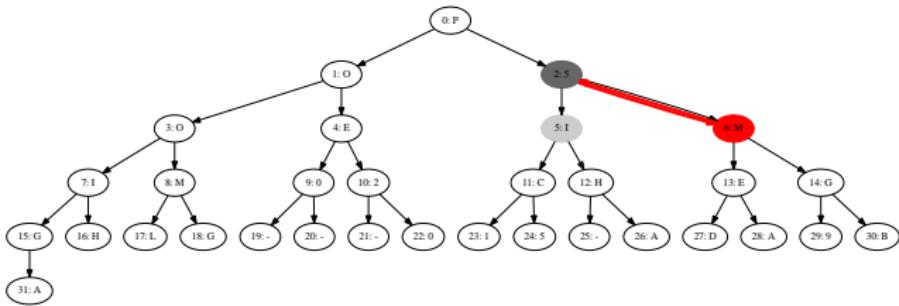


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 32 Array contents: 50POEHMM02CHEGGHHLG—015-ADA9BARRRSSSTT

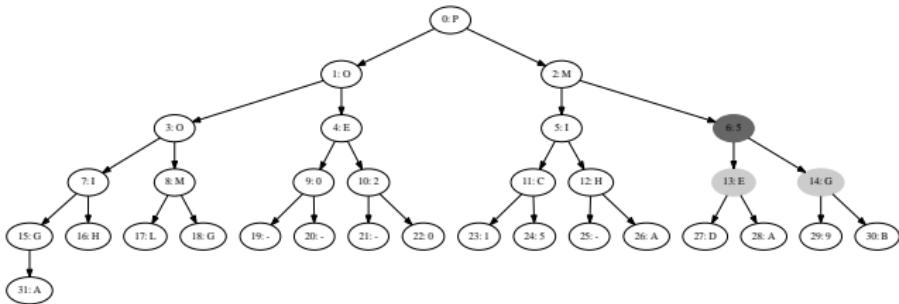


Running heapify on node 2.
Heap size: 32 Array contents: P050EIMM02CHEGGHLG-015-ADA9BARRSSSTT

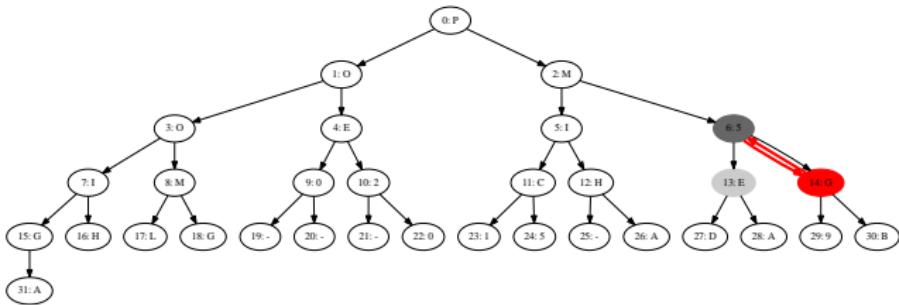


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 32 Array contents: P050EIMM02CHEGGHHLG—015-ADA9BARRRSSSTT

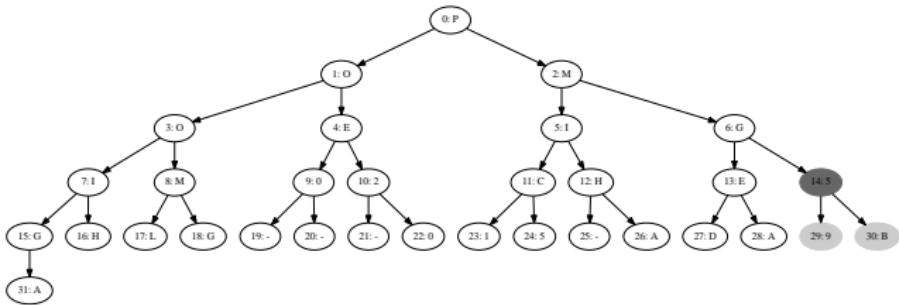


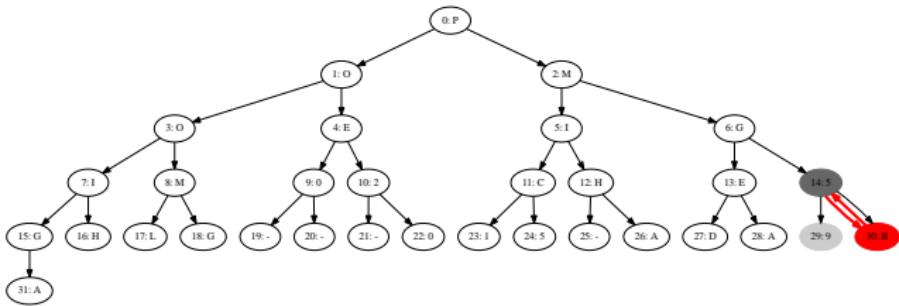
Running heapify on node 6.
Heap size: 32 Array contents: POMOE15IM02CHEGGHLG—015-ADA9BARRSSSTT



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: POMOEISIM02CHEGGHLG—015-ADA9BARRRSSSTT

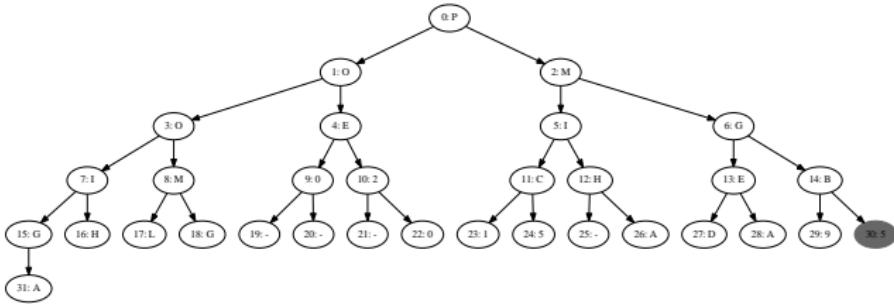




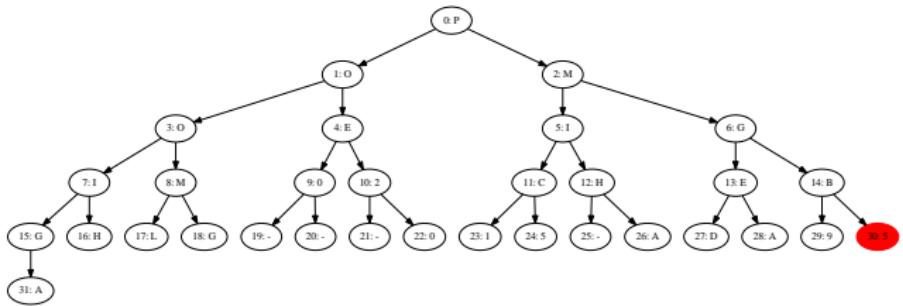
Largest of node 14 and its children is node 30.

Root and max will be swapped and heapify will recurse on the new node 30.

Heap size: 32 Array contents: POMOEIGIM02CHE5GHLG—015-ADA9BARRRSSSTT



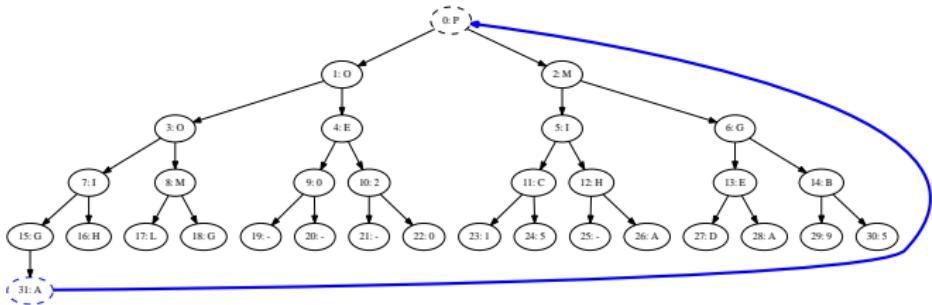
Running heapify on node 30.
Heap size: 32 Array contents: POMOEIGIM02CHEBGHLG—015-ADA95ARRRSSSTT



Largest of node 30 and its children is node 30

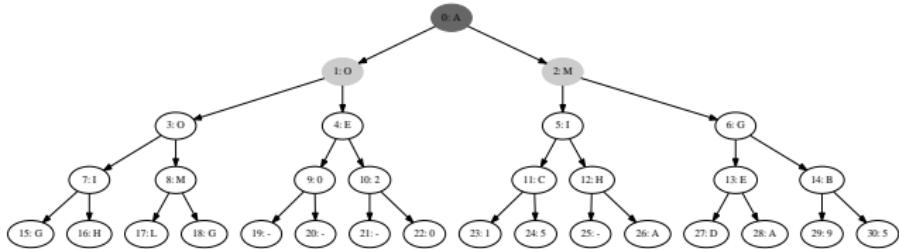
No swap is necessary, heapify done.

Heap size: 32 Array contents: POMOEIGIM02CHEBGHLG--015-ADA95ARRRSSSTT

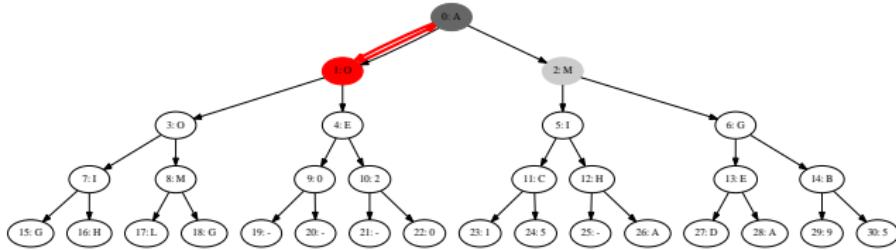


Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.
Heap size: 32 Array contents: POMOEIGIM02CHEBGHLG—015-ADA95ARRRSSSTT



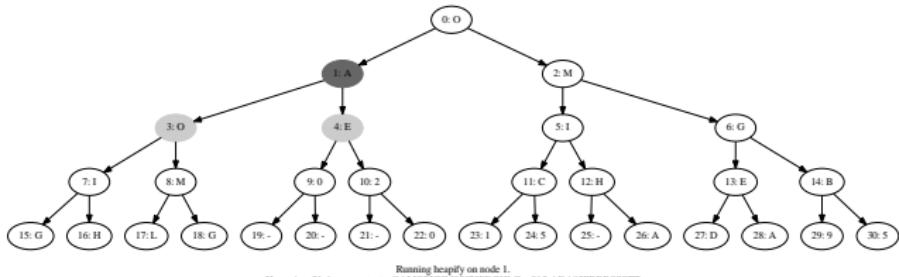
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 31 Array contents: AOMOEIGIM02CHEBGHLG--015-ADA95PRRRSSSTT

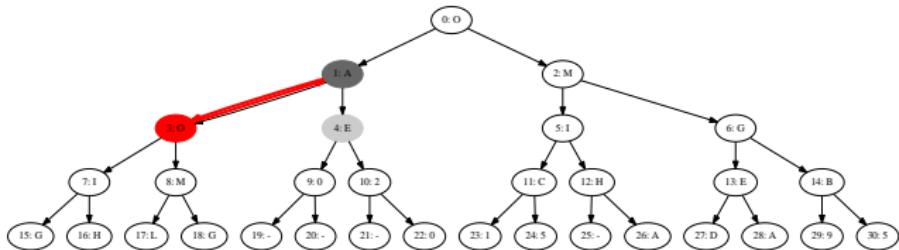


Largest of node 0 and its children is node 1.

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

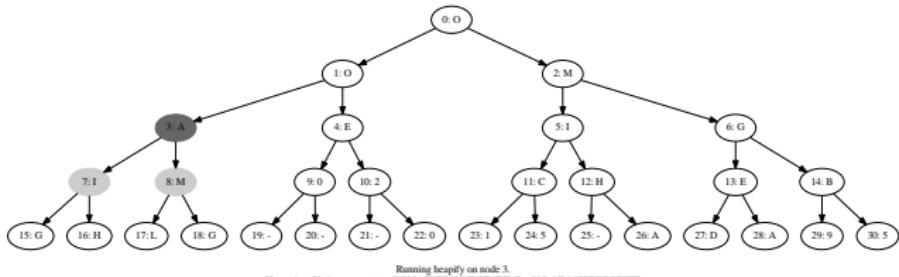
Heap size: 31 Array contents: AOMOEIGIM02CHEBGHLG--015-ADA95PRRRSSSTT

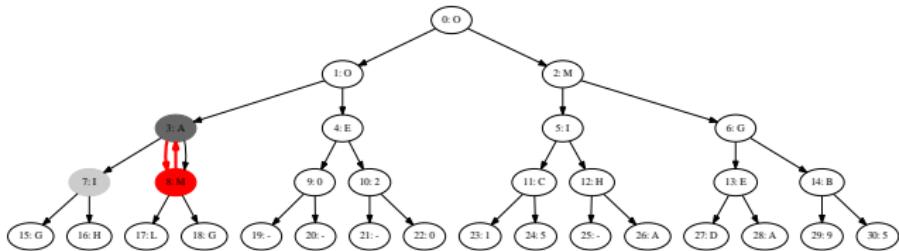




Largest of node 1 and its children is node 5.

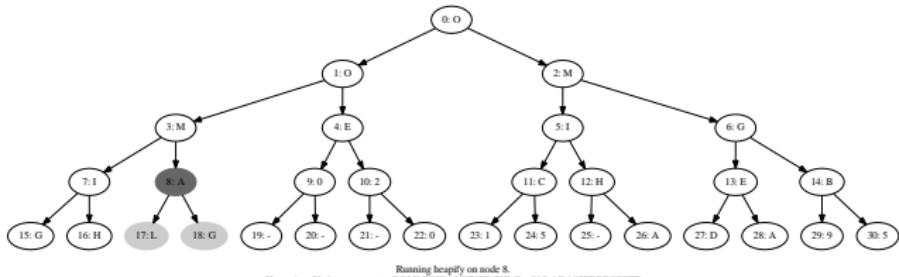
Root and max will be swapped and heapify will recurse on the new node 3.
 Heap size: 31 Array contents: OAMOECHM012CBEGBHLG-015-ADA95PRRRSSSTT

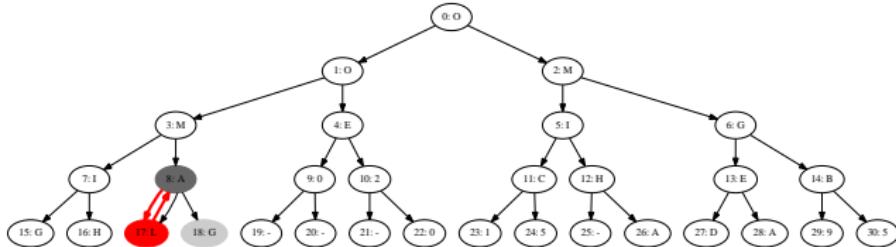




Largest of node 3 and its children is node 8.

Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 31 Array contents: OOMAEIGHMNOICHEBGHILG-015-ADA95PRRRSSSTT

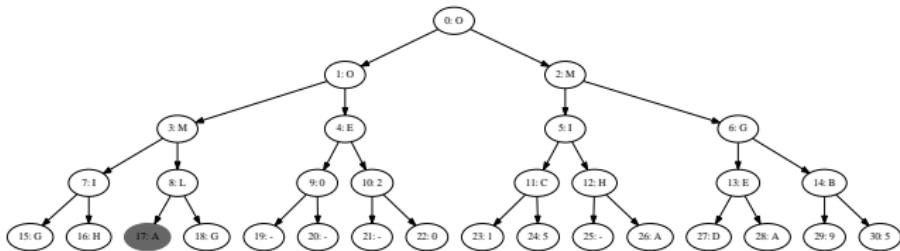




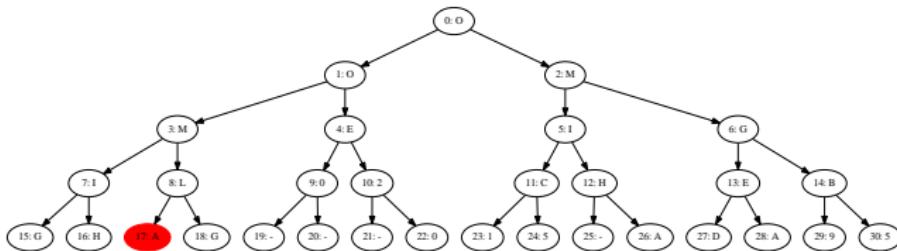
Largest of node 8 and its children is node 17.

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

Heap size: 31 Array contents: 00MMEIGIA02CHEBGHLG--015-ADA95P RRRSSSTT



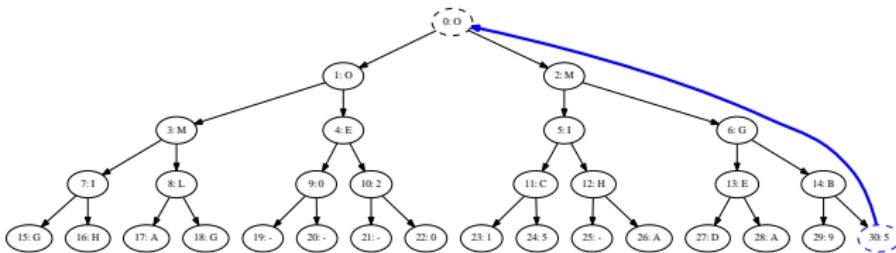
Running heapify on node 17.
Heap size: 31 Array contents: DOMMEIGHLO2CHEIGHAG--015-ADA95PRRRSSSTT



Largest of node 17 and its children is node 17

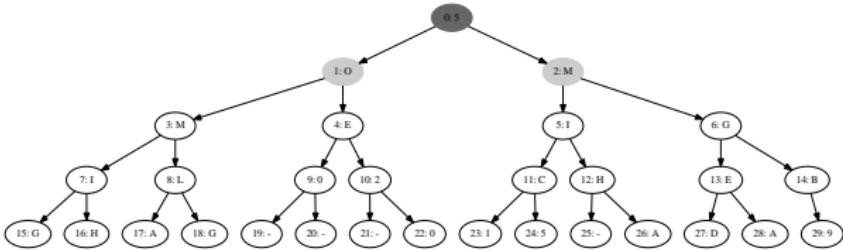
No swap is necessary, heapify done.

Heap size: 31 Array contents: OOMMEIGIL02CHEBGHAG--015-ADA95P RRRSSSTT

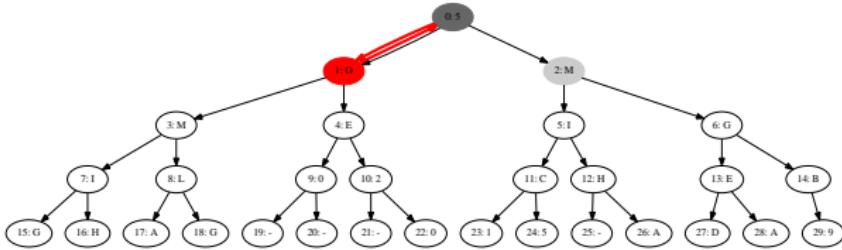


Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.
Heap size: 31 Array contents: OOMMEEHHLIOOCHEBHGAG-015-ADA95PRRRSSSTT

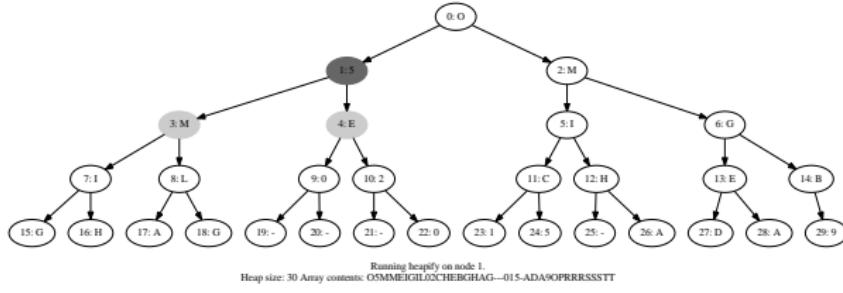


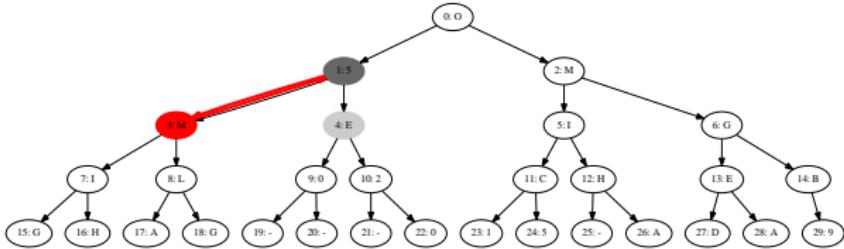
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 30 Array contents: 50MMEIGL02CHEBGHAG--015-ADA9OPRRRSSSTT



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: SOMMEIGILO2CHEBGHAG---015-ADA9OPRRRSSSTT

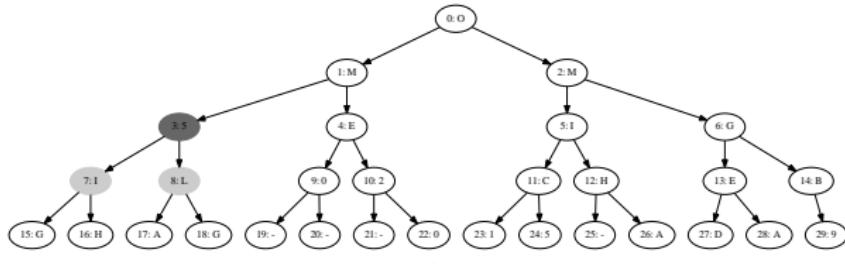




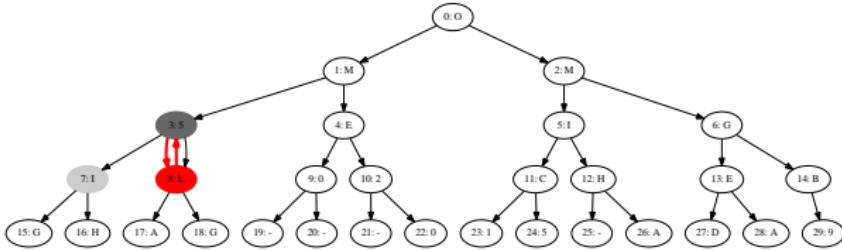
Largest of node 1 and its children is node 3.

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

Heap size: 30 Array contents: 05MMEIGIL02CHEBGHAG--015-ADA90P RRRSSSTT

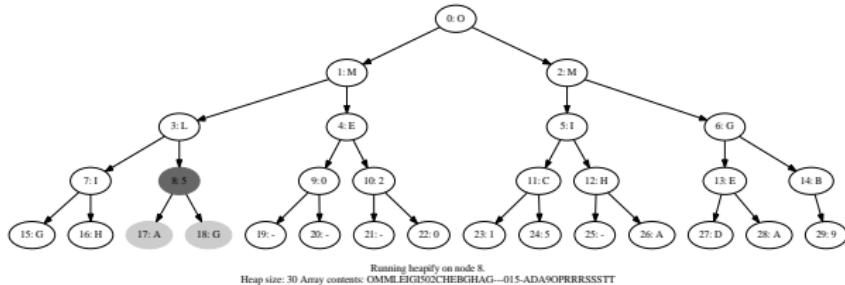


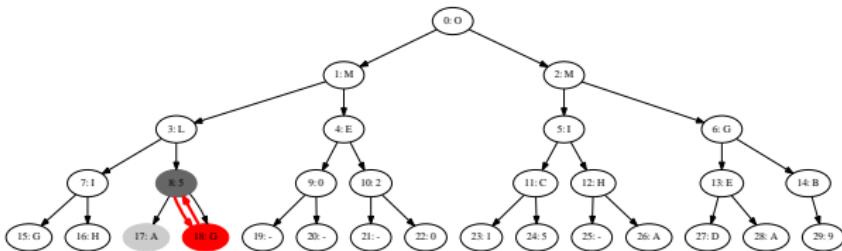
Running heapify on node 3.
Heap size: 30 Array contents: OMMSEIGL02CHEBGHAG—015-ADA9OPRRRSSSTT



Largest of node 3 and its children is node 8.

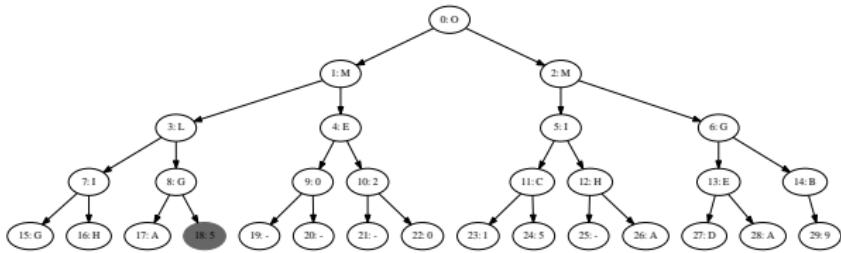
Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 30 Array contents: OMM5E1GILO2CHEBGHAG--015-ADA9OPRRR5SSSTT



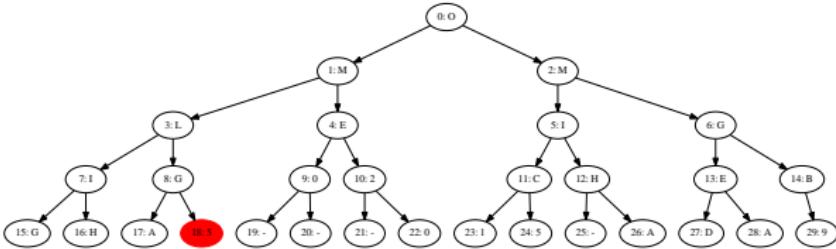


Largest of node 8 and its children is node 18.

Root and max will be swapped and heapify will recurse on the new node 18.
Heap size: 30 Array contents: OMMLEIGH9SCHEBGHAG-015-ADA9OPRRRSSSTT



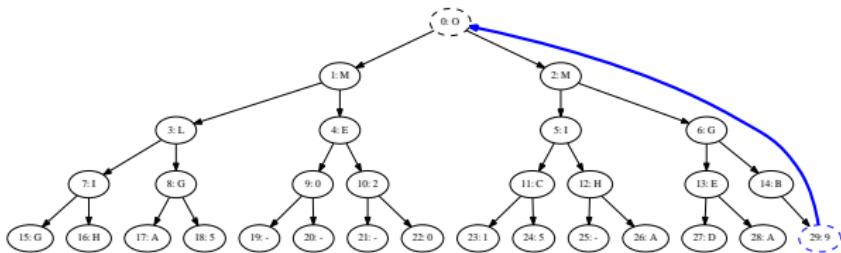
Running heapify on node 18.
Heap size: 30 Array contents: OMMLIEIGHG02CHEIGHA5—015-ADA9OPRRRSSSTT



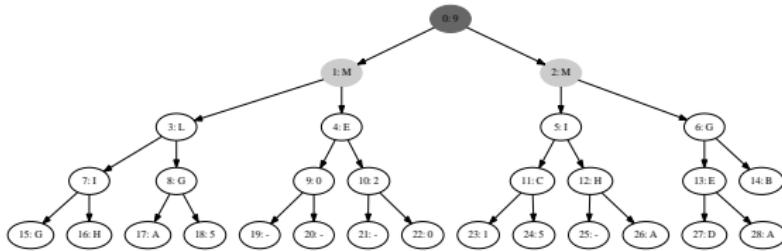
Largest of node 18 and its children is node 18

No swamp is necessary, hewspify done.

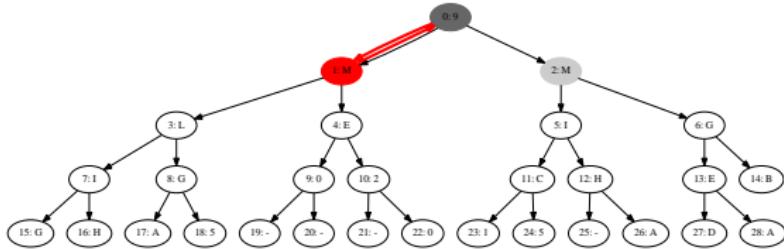
Heap size: 30 Array contents: OMMLEIIGIG02CHEBGHAs---015-ADA90PRRRSSSTT



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: OMMLIEHIGDZCIEHGHA5—015-ADA9OPRRRSSSTT



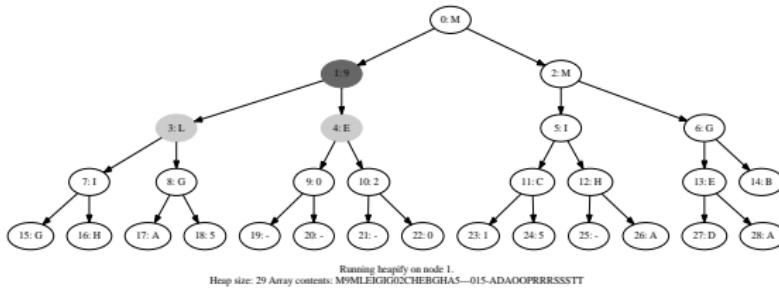
Running heapify on node 0 as part of the repair heap (heap-down) process.
 Heap size: 29 Array contents: 9MMMLEIGHG02CHEBGHAS--015-ADAOOPRRRRSSSTT

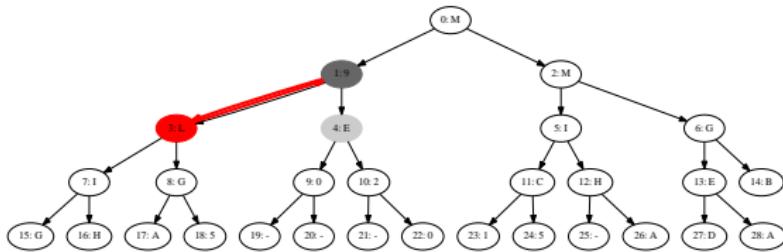


Largest of node 0 and its children is node 1.

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

Heap size: 29 Array contents: 9MMLEIGIG02CHEBGHAs—015-ADAOOPRRRSSSTT

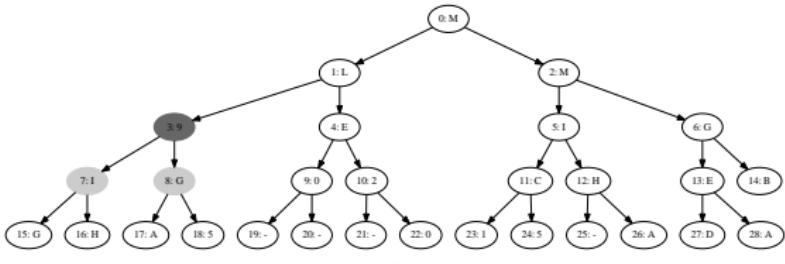


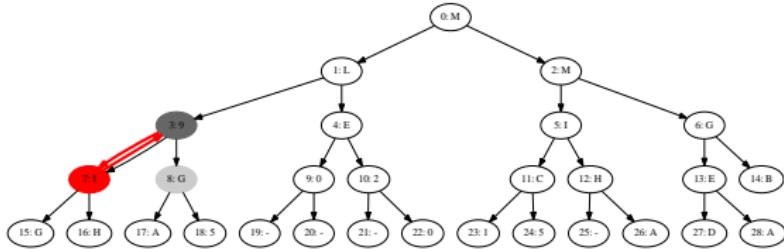


Largest of node 1 and its children is node 3.

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

Heap size: 29 Array contents: M9MLEIGIG02CHEBGHA5--015-ADA00PRRRSSSTT

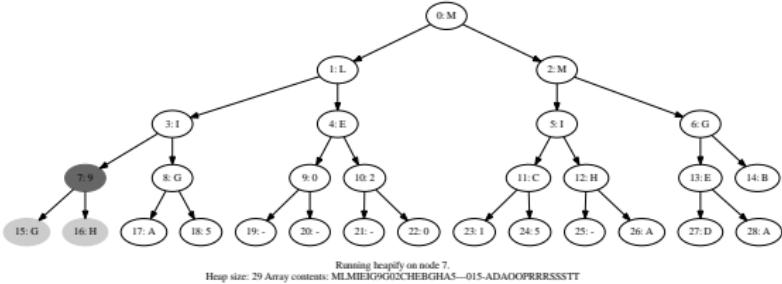


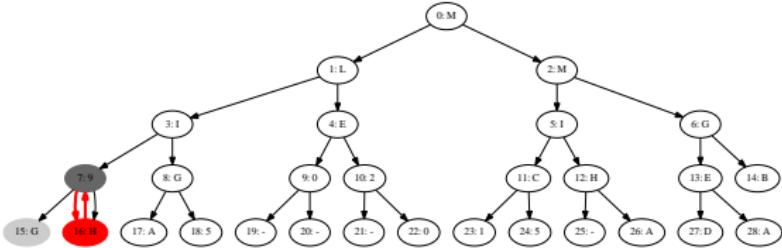


Largest of node 3 and its children is node 7.

Root and max will be swapped and heapify will recurse on the new node 7.

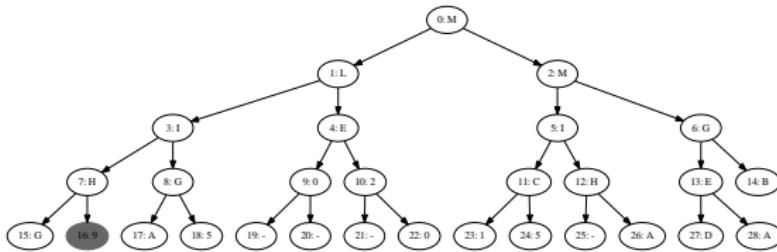
Heap size: 29 Array contents: MLM9EIGIG02CHEBGHAs—015-ADAOOPRRRSSSTT



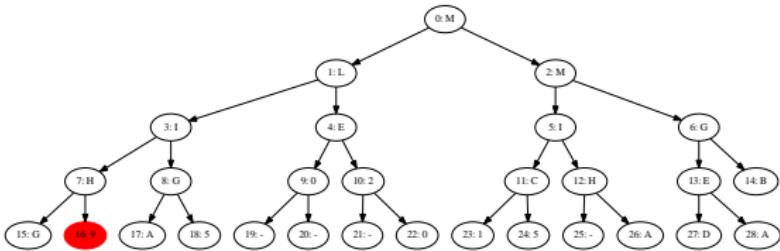


Largest of node 7 and its children is node 16.

Root and max will be swapped and heapify will recurse on the new node 16.
Heap size: 29 Array contents: MLMIEIG9G02CHEBGHA5—015-ADAOOPRRR5SSTT



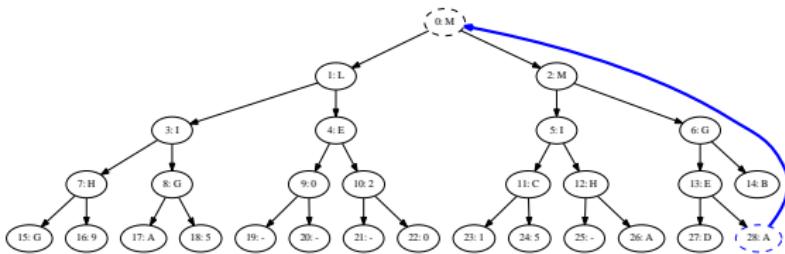
Heap size: 29 Array contents: MLMIE3GHG02CHEBG9A5---015-ADAOPRRRSSSTT



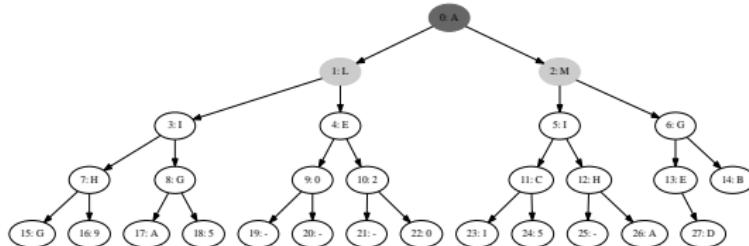
Largest of node 16 and its children is node 16.

No swap is necessary, heapify done.

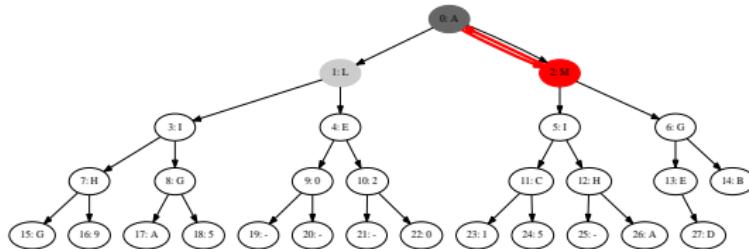
Heap size: 29 Array contexts: MLMIEIGHG02CHEBG9A5--015-ADAOOPRRRSSSTT



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: MLMIEIGHGQ2CHEBG9A5—015-ADAOOPRRRSSSTT

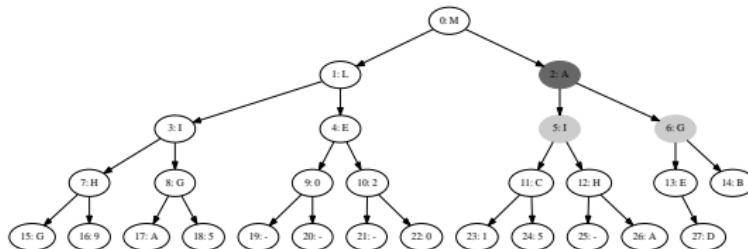


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 28 Array contents: ALMIEJGHG02CHEBG9A5---015-ADMOOPRRRSSSTT

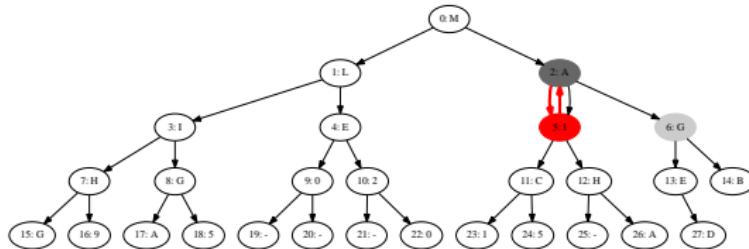


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 28 Array contents: ALMIE3GHG02CHEBG9AS—015-ADMOOPBRSSSTT

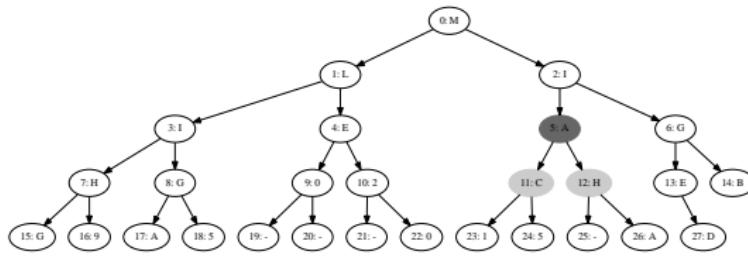


Running heapify on node 2.
Heap size: 28 Array contents: M L A I E 2 G H G O 2 C H E B G 9 A 5 — 0 1 5 — A D M O O P R R R S S S T T

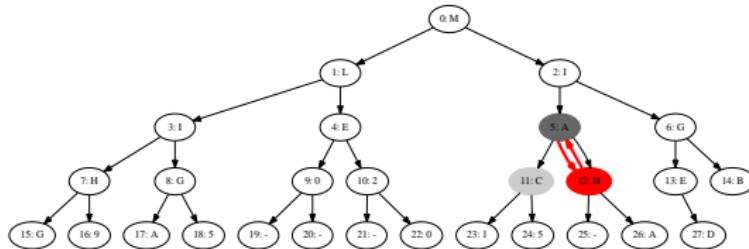


Largest of node 2 and its children is node 5.

Root and max will be swapped and heapify will recurse on the new node 5.
Heap size: 28 Array contents: MLAIE3GHG002CHEBG9AS—015-ADMOOPRBRSSSTT

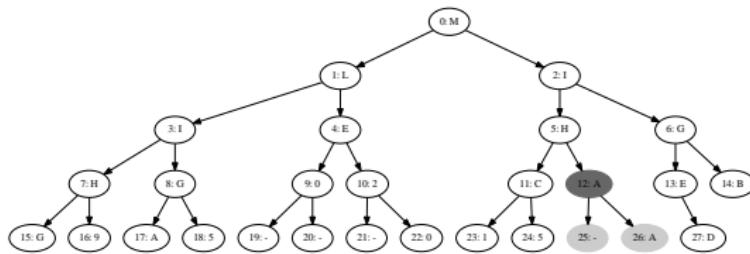


Running heapify on node 5.
Heap size: 28 Array contents: MLIIIEAGHG02CHEBG9A5---015-ADMOOPRRRSSLTT

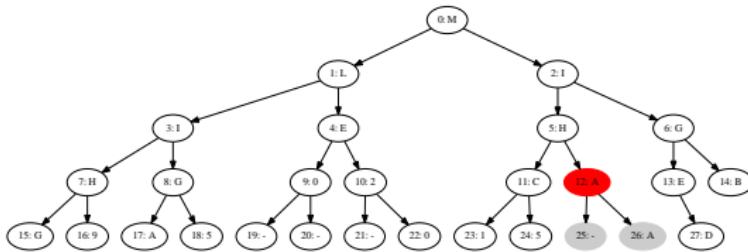


Largest of node 5 and its children is node 12.

Root and max will be swapped and heapify will recurse on the new node 12.
Heap size: 28 Array contents: ML:HEAGBGZCZCHEBG9AS—015-ADMOOPRBRSSSTT



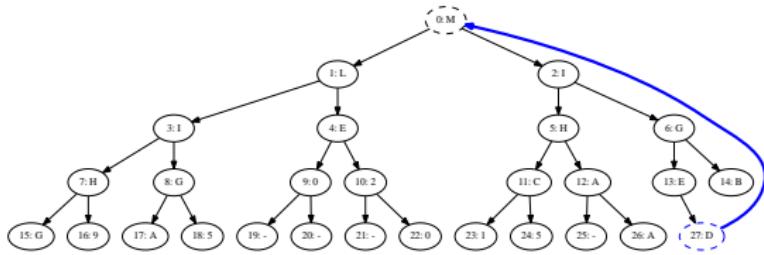
Running heapify on node 12.
Heap size: 28 Array contents: MLHEHGIG02CAEBG9A5---015-ADMOOPRRSSSTT



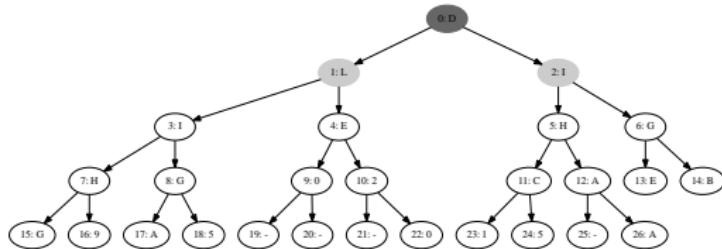
Largest of node 12 and its children is node 12.

No swap is necessary, heapify done.

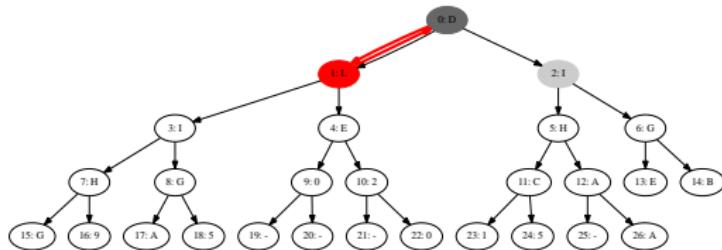
Heap size: 28 Array contents: MLEHGHGGC2CAEBGD9AS—015-ADMOOPRRSSSSTT



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: MLJIEHGHGZDCAEBCD9AS—015-ADMOOPRRRSSSTT

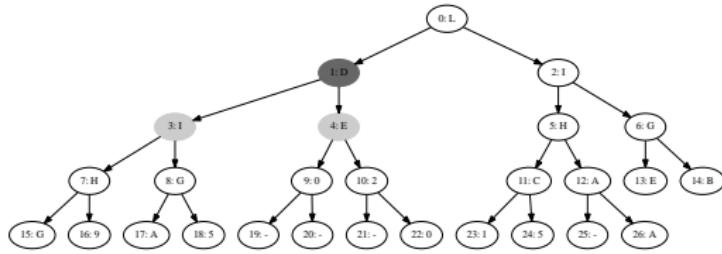


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 27 Array contents: DLIEEHGHG02CAEBG9A5---015-AMMOOPRRRSSSTT

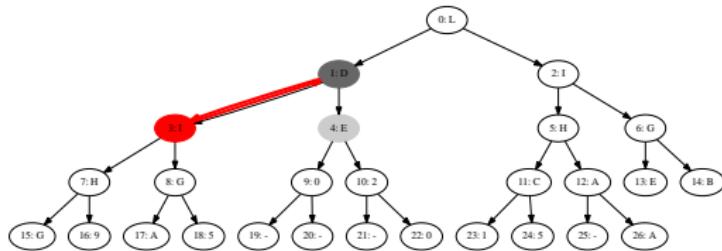


Largest of node 9 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 27 Array contents: DLIEEHGHGZC2CAEBC9AS—015-AMMOOPRBRSSSTT

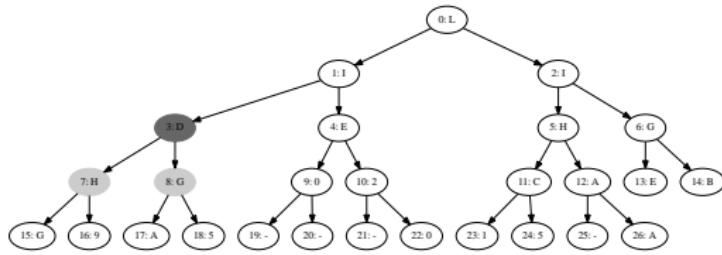


Running heapify on node 1.
Heap size: 27 Array contents: LDIEHGHG02CAEBG9A5---015-AMMOOPRRRSSSTT

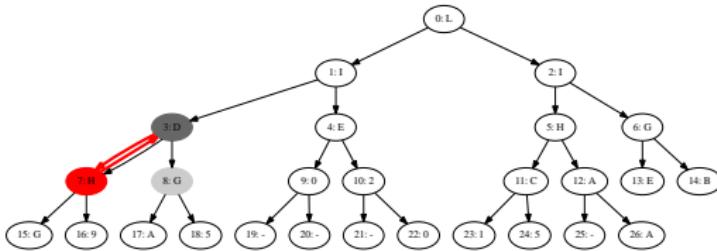


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 27 Array contents: LDIEEHGHGIOZCAEBC9AS—015-AMMOOPRBRSSSTT

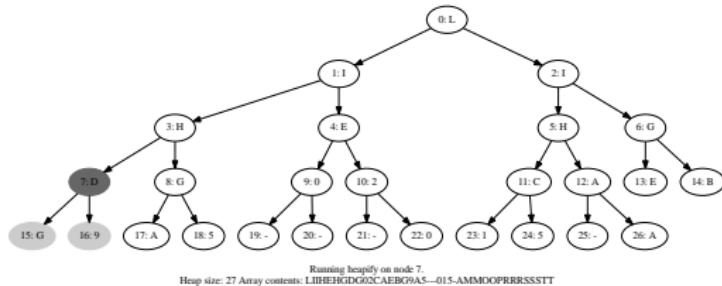


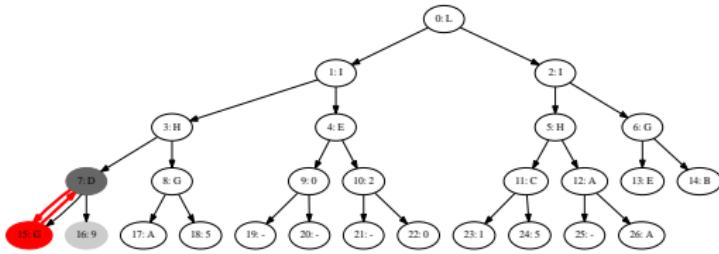
Running heapify on node 3.
Heap size: 27 Array contents: LIIDEHGHG02CAEBG9A5---015-AMMOOPRRRSSSTT



Largest of node 3 and its children is node 7.

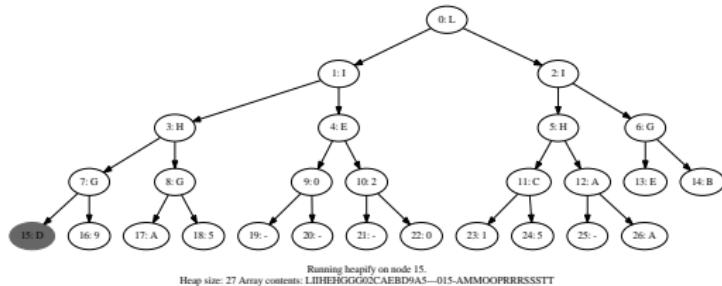
Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 27 Array contents: LIIDEHGHG02CAEBG9A5-015AMMOOPRRRSS5TTT

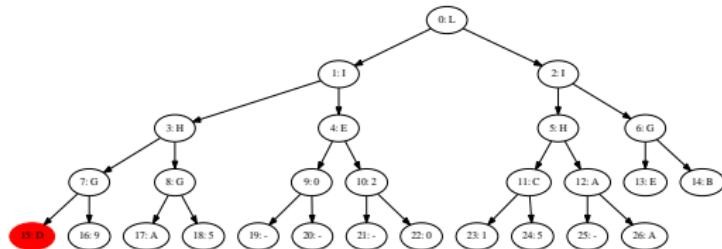




Largest of node 7 and its children is node 15.

Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 27 Array contents: L1IHEHGDG02CAEBG9AS--015-AMMOOPRRR555TT

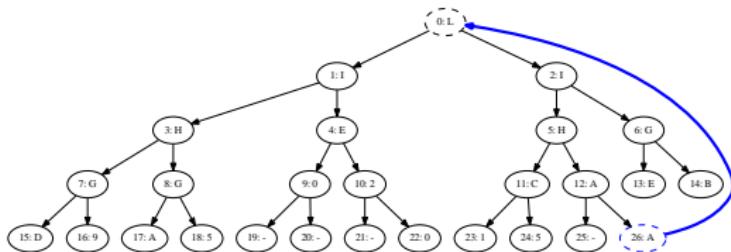




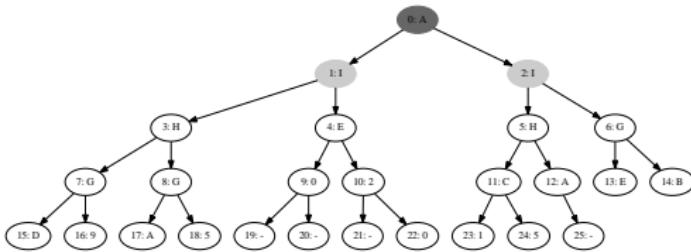
Largest of node 15 and its children is node 15.

No swap is necessary, heapify done.

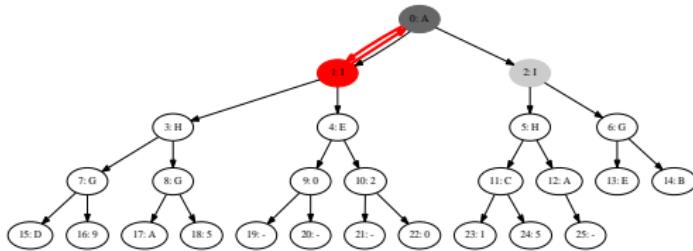
Heap size: 27 Array contents: LIIHEHGGGGCAEBD9AS—015-AMMOOPRRRSSSTT



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: LJIHEHGGGGCAEBD9AS—015-AMMOOPRRRSSSTT



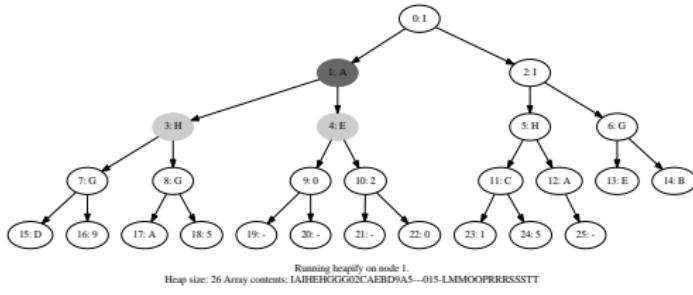
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 26 Array contents: AIIHEHGGOOGCAEBD9A5---015-LMMOOPIRRRSSSTT

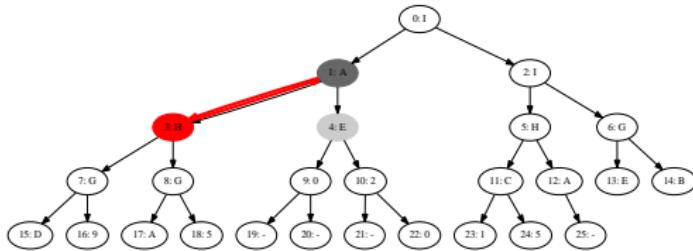


Largest of node 0 and its children is node 1

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

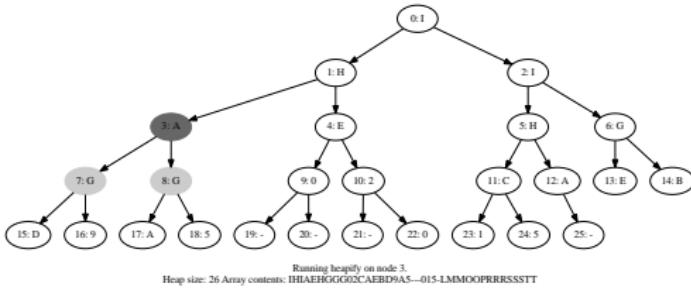
Heap size: 26 Array contents: AIIIEHGGG02CAEBD9A5--015-LMMMOOPRRRSSSTT

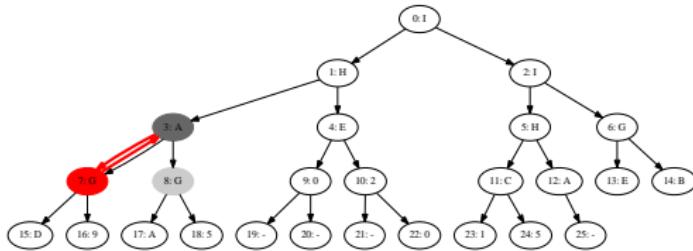




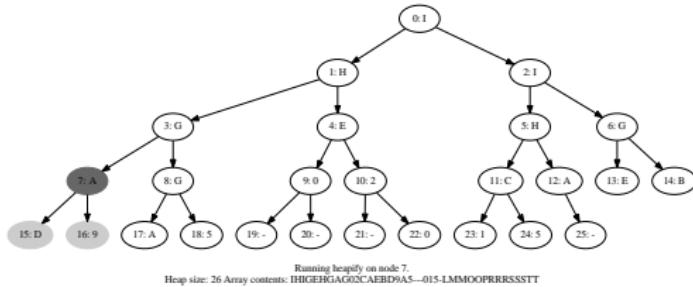
Largest of node 1 and its children is node 3.

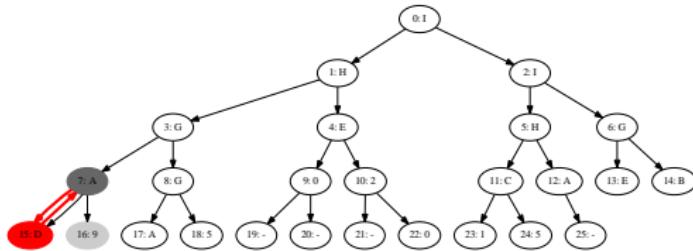
Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 26 Array contents: IAIHEHGGG02CAEBD9A5--015-LMMOOOPRRRSSSSTTT





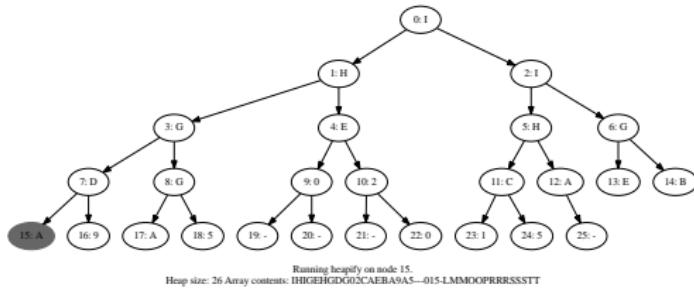
Largest of node 3 and its children is node 7.
 Root and max will be swapped and heapify will recurse on the new node 7.
 Heap size: 26 Array contents: IHIAEHGGGGCCEBED9AS—015-LMMMOOPRRRSSSTT

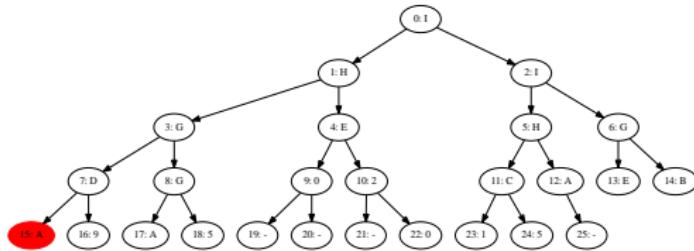




Largest of node 7 and its children is node 15.

Root and max will be swapped and heapify will recurse on the new node 15.
Heap size: 26 Array contents: IHIGEHGAG02CAEBD9AS-015-LMMDOPRRSSSSTT

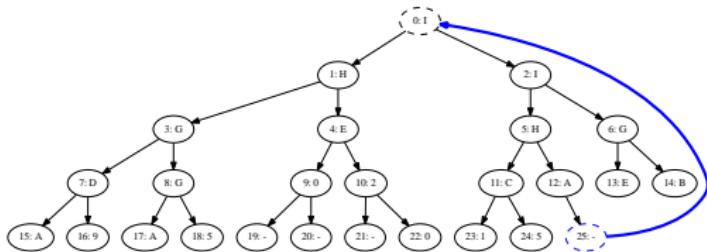




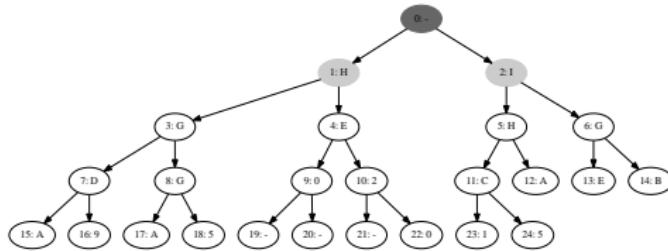
Largest of node 15 and its children is node 15.

No swap is necessary, heapify done.

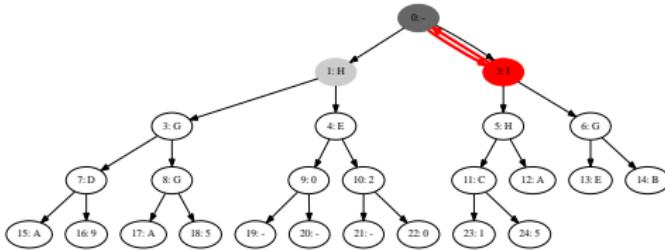
Heap size: 26 Array contents: IHIGEHGDG02CAEBAA9AS—015-LMMOOOPRRSSSTT



Removing root and moving it outside of the heap.
The last element takes its place and the heap size is diminished.
Heap size: 26 Array contents: IHIGEHGDG@2CAEBA@AS—015-LMMOOPORRRSSSTT

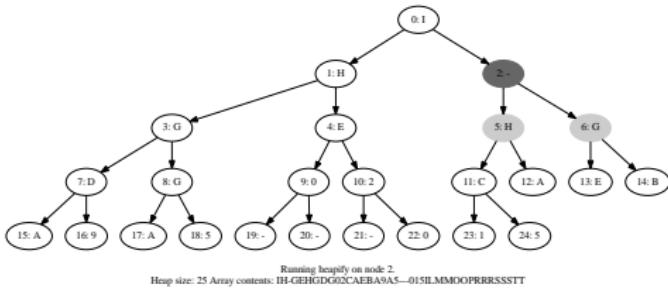


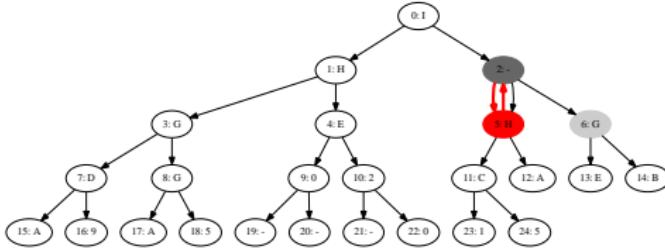
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 25 Array contents: -HIGEHGDG02CAEBA9A5---015ILMMOOPLRRR5SSTT



Largest of node 9 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: -HIGEHGDGGCCAEBA9AS---015HLMMOOOPBRSSSTT

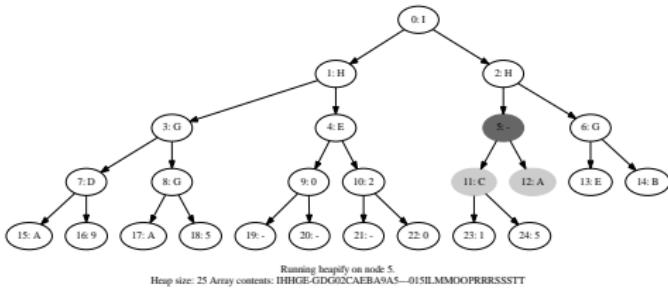


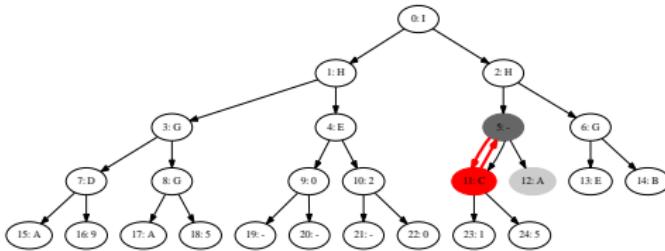


Largest of node 2 and its children is node 5.

root and max will be swapped and heapify will recurse on the new node 5.

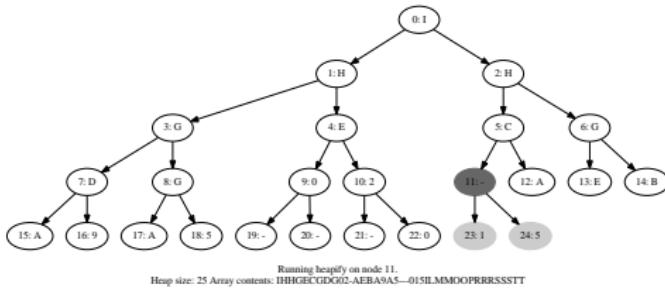
Heap size: 25 Array contents: IH-GEHGDG02CAEBA9AS---015ILMMOOPRRRSSSTT

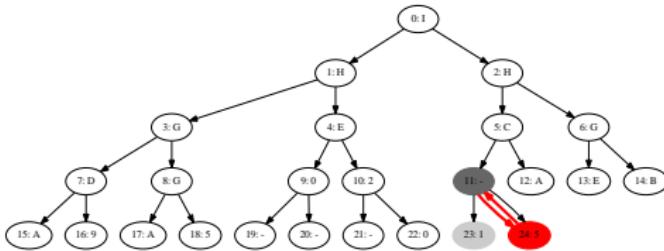




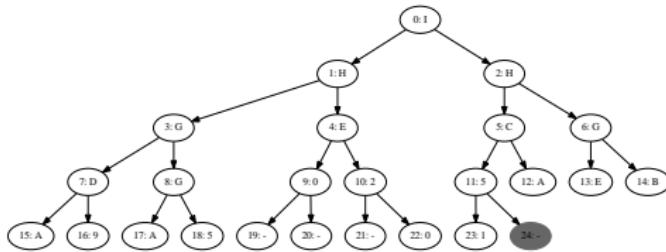
Largest of node 5 and its children is node 11

Root and max will be swapped and heapify will recurse on the new node 11.
Heap size: 25 Array contents: IHHGE-GDG02CAEBA9A5—015ILMMOOOPRRR5S5TT

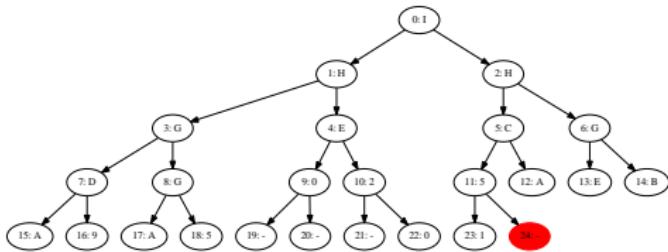




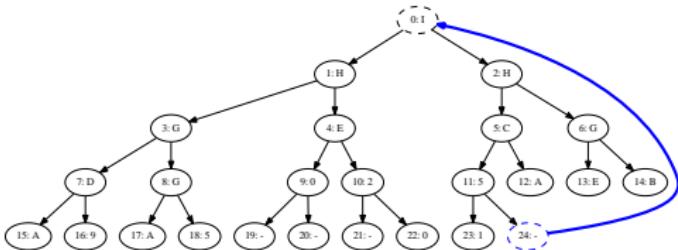
Largest of node 11 and its children is node 24.
 Root and max will be swapped and heapify will recurse on the new node 24.
 Heap size: 25 Array contents: IHHRGECDG00-AEBA9AS—015ILMMOOOPRRSSSTT



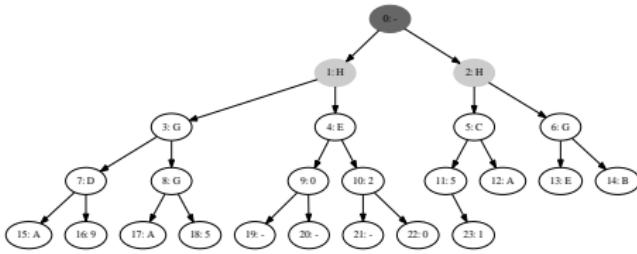
Running heapify on node 24.
Heap size: 25 Array contents: 1HHGECCDG025AEBA9A5—01-ILMMOOPLRRSSSTT



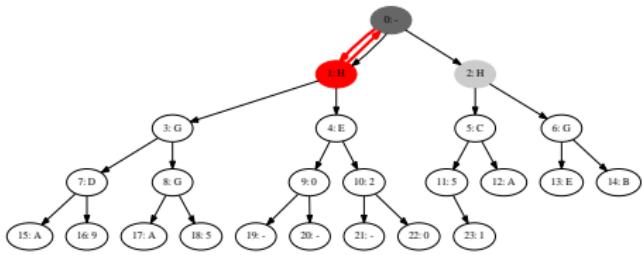
Largest of node 24 and its children is node 24.
No swap is necessary, heapify done.
Heap size: 25 Array contents: IHHGEGCDCG025AEBA9AS—01-ILMMMOOPRRSSSTT



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: IHHEGCDC025AEBA9AS—01-LMMOOOPRRRSSSTT

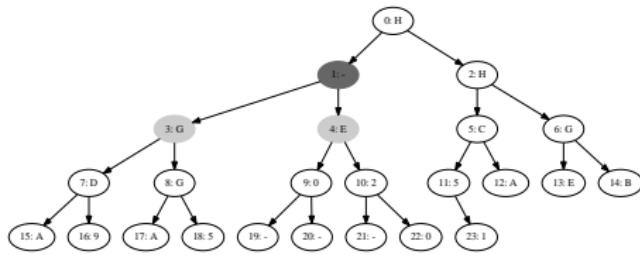


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 24 Array contents: -HHGECCDG025AEBA9A5--01HLMMOOPRRRSSSTT

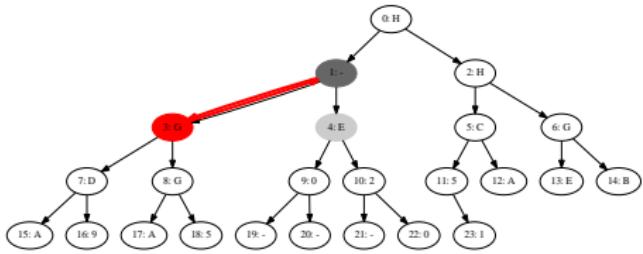


Largest of node 0 and its children is node 1

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 24 Array contents: -HHGECGDG025AEBA9A5--011LMMMOOPRRR5SSSTT



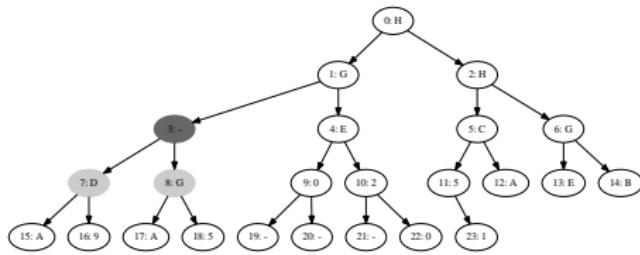
Running heapify on node 1.
Heap size: 24 Array contents: H-HGECCDCG025AEBA9A5--0IIILMMOOPRRRSSSTT

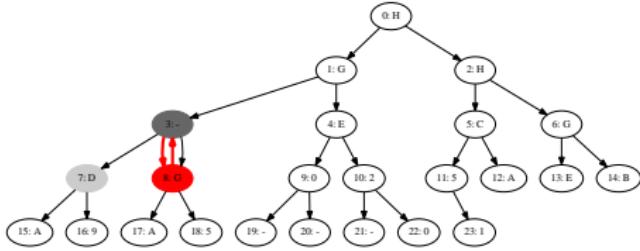


Largest of node 1 and its children is node 3.

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

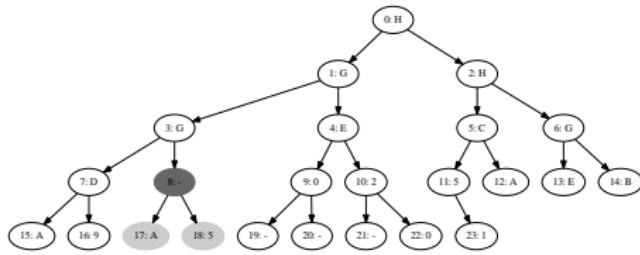
Heap size: 24 Array contents: H-HGECGDG025AEBA9A5--01IIILMMOOOPRRRSSSTT



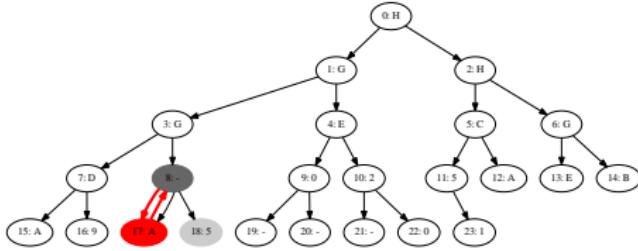


Largest of node 3 and its children is node 8.

Root and max will be swapped and heapify will recurse on the new node 8.
Heap size: 24 Array contents: HGH-ECGDG025AEBA9A5-011LMM0OPRRR5SSSTT

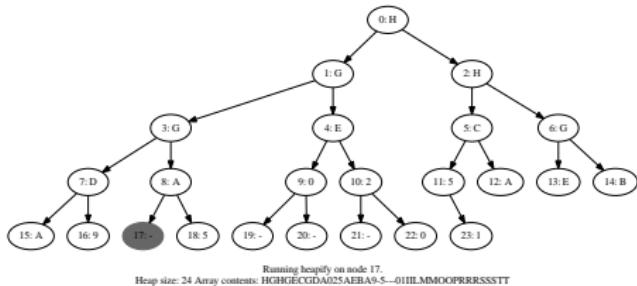


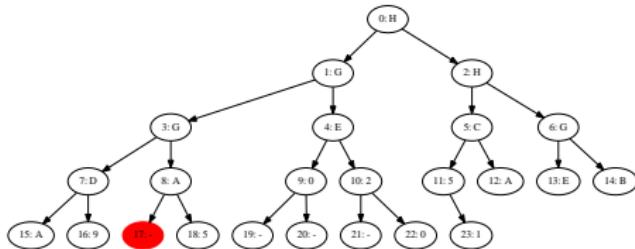
Running heapify on node 8.
Heap size: 24 Array contents: HGHGECCGD-025AEBA9A5--0IIILMMOOOPRRRSSSTT



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-025AEBAA9A5-011ILMMOOOPRRRSSSTT

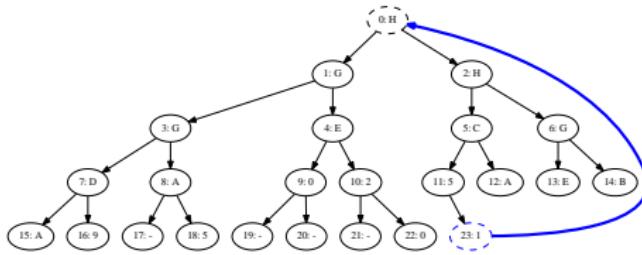




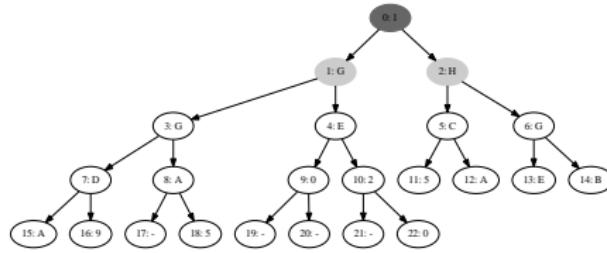
Largest of node 17 and its children is node 17.

No swap is necessary, heapify done.

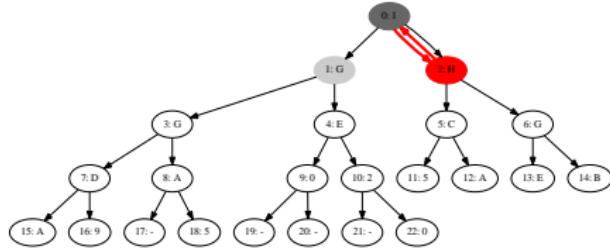
Heap size: 24 Array contents: HGHGECCDA/0/25AEB/A9-5-01HHLMMOOPRRSSSSTT



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: HGHGECCGAOA25AEBA95—01HLMMOOPRRRSSSTT



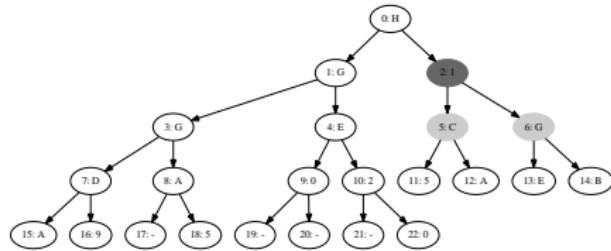
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 23 Array contents: IGHGECCDA025AEBA9-5-0HILMMOOFRRRSSSTT



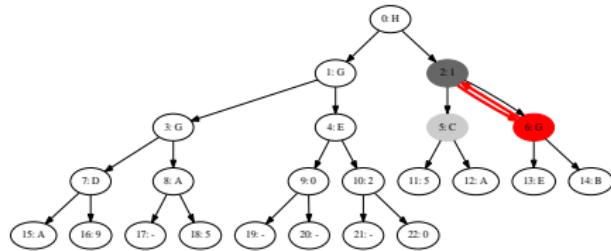
Largest of node 0 and its children is node 2

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

Heap size: 23 Array contents: 1GHGECGDA025AEBA9-5---0HIILMMOOPRRRSSSTT

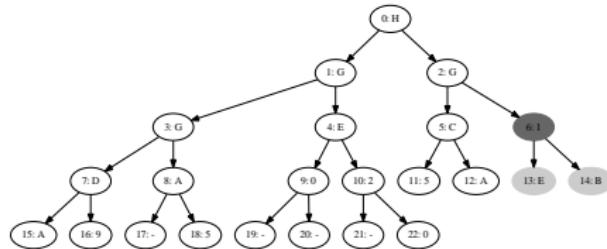


Running heapify on node 2.
Heap size: 23 Array contents: HGIGECCDA025AEBA9-5---0HIIILMMOOPRRRSSSTT

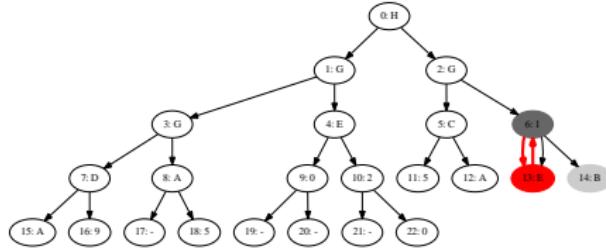


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
 Heap size: 23 Array contents: H@!GECCDA@025AEB@9-5--0HILMMOOOPRRRSSSTT

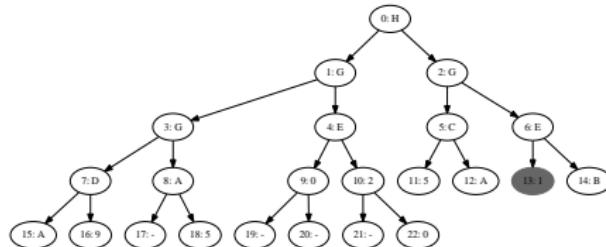


Running heapify on node 6.
Heap size: 23 Array contents: HGGGECEIDA025AEBA9-5---0HIIILMMOOOPRRRSSSTT

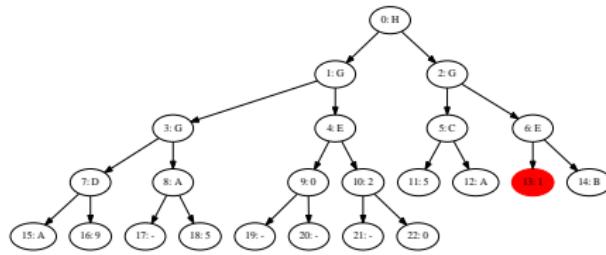


Largest of node 6 and its children is node 13.

Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 23 Array contents: HGGGECLDA025AEBA9-5---0HIIILMMOOOPRRRSSSTT



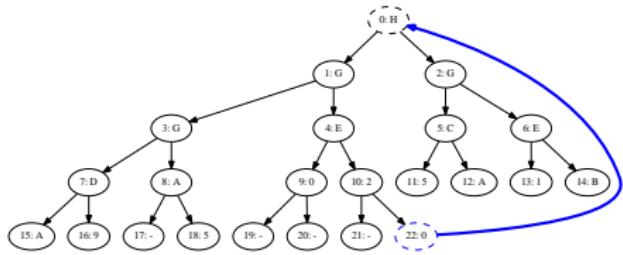
Running heapify on node 13.
Heap size: 23 Array contents: HGGGECHDA025A1BA9-5--0HHLMMOOOPRRRSSSTT



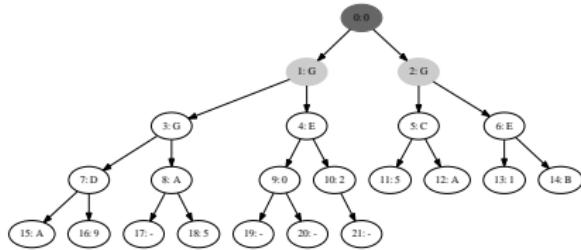
Largest of node 13 and its children is node 13.

No swap is necessary, heapify done.

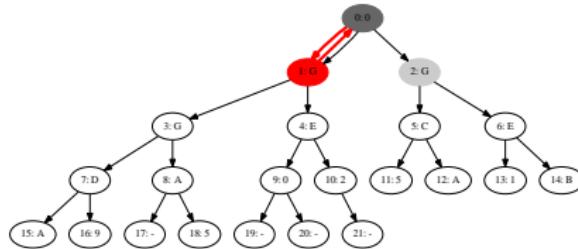
Heap size: 23 Array contents: HGGGGCECDDA025A1BA9-5--0HIIILMMOOOPRRRSSSTT



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: HGGGECHDA025A1BA95-0HHLMMOOPRRRSSSTT

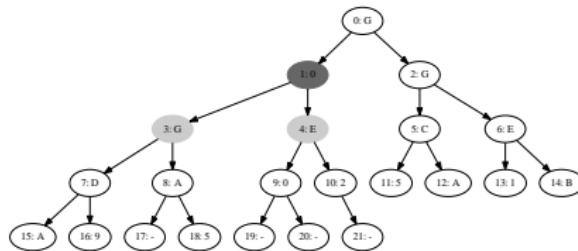


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 22 Array contents: OGGGECEADA025A1BA9-5--HHHILMMOOFRRRSSSSTTT

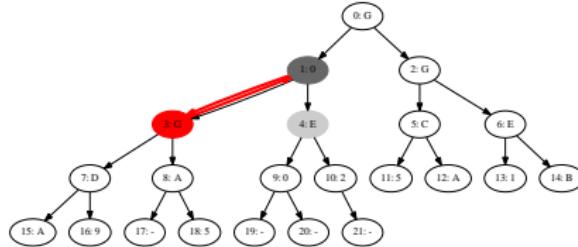


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
 Heap size: 22 Array contents: 0GGGGCECDA025A1BA9:5-IHHILMMOOOPRRRSSSTT



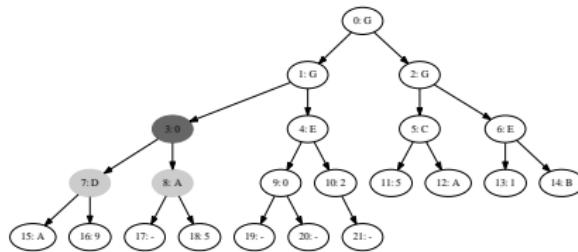
Running heapify on node 1.
Heap size: 22 Array contents: GGGGECEADA025A1BA9-5-HHHILMMOOOPRRRSSSTT



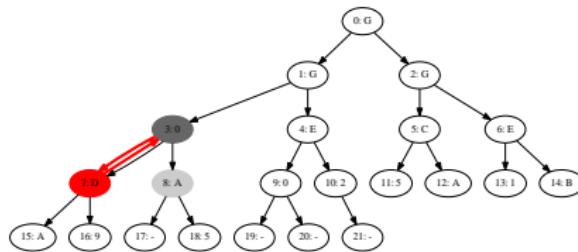
Largest of node 1 and its children is node 3

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

Heap size: 22 Array contents: G0GGECEADA025A1BA9-5--HHIILMMOOOPRRRSSSTT

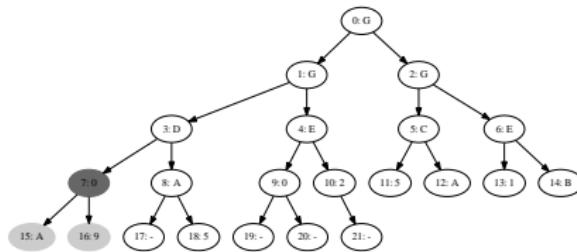


Running heapify on node 3.
Heap size: 22 Array contents: GGGGEECLDA025A1BA9-5—HHHILMMOOOPRRRSSSTT

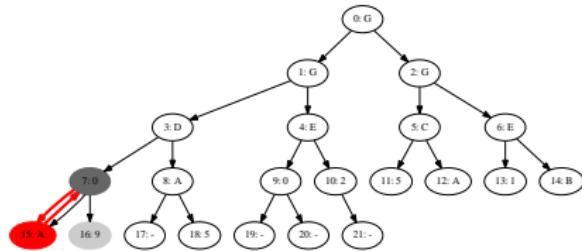


Largest of node 3 and its children is node 7.

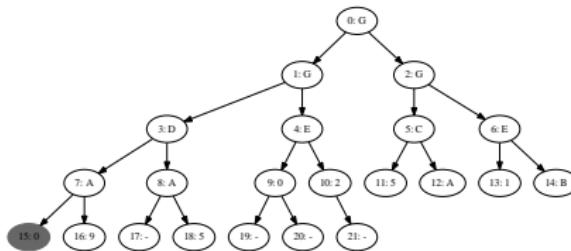
Root and max will be swapped and heapify will recurse on the new node 7.
 Heap size: 22 Array contents: GGGHECEDA025A1BA9-5-IHHILMMOOOPRRRSSSTT



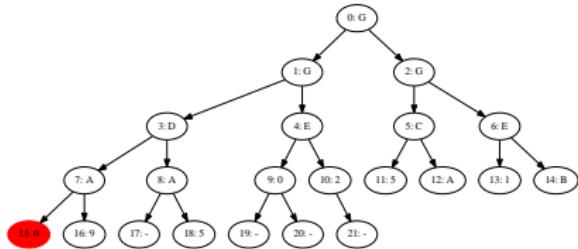
Running heapify on node 7.
Heap size: 22 Array contents: GGGDECIIIA025A1BA9-5—HHIILMMOOOPRRRSSSTT



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: GGGGECCBIA025A1BA9-5-4HHILMMOOOPRRRSSSTT



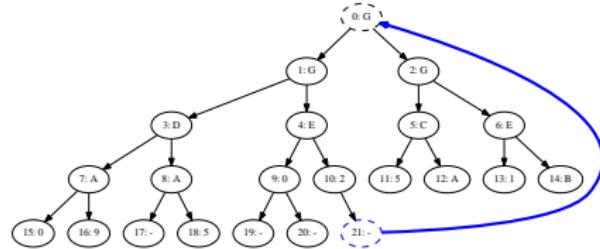
Running heapify on node 15.
Heap size: 22 Array contents: GGGDECIAA025A1B09-5--HHHILMMOOOPRRRSSSTT



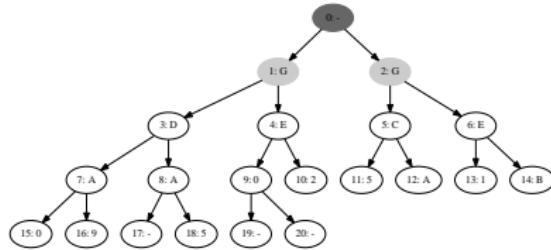
Largest of node 15 and its children is node 15.

No swap is necessary, heapify done.

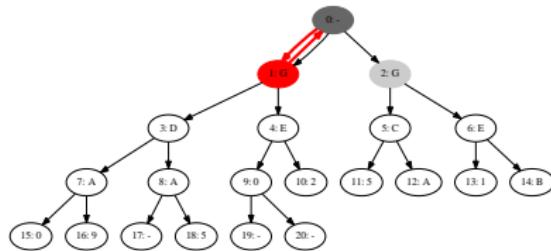
Heap size: 22 Array contents: GGGGECEAA025A1B09-5—HHHILMMOOPRRRSSSTT



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---HHIILMMOOPTRRRSSSTT

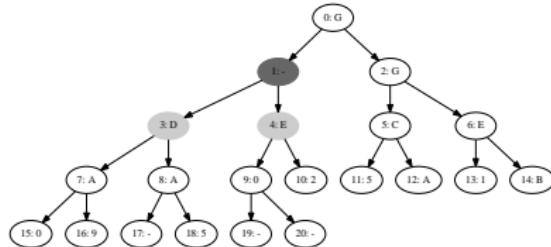


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 21 Array contents: -GGDECEAA025A1B09-5-GHHHLMMOOFRRRSSSTT

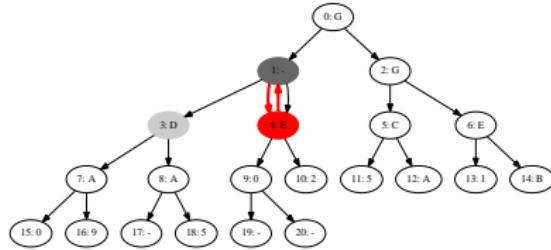


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 21 Array contents: -GGDECEAAM025A1B09-5-GHHLILMMOOPLRRSSSTT

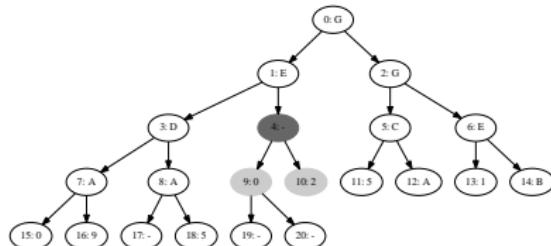


Running heapify on node 1
Heap size: 21 Array contents: G-GDIECEAA025A1B09-5--GHHIIILMMOOOPRRRSSSTT

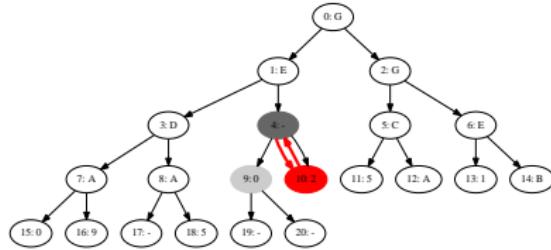


Largest of node 1 and its children is node 4.

Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 21 Array contents: G-GDECEAA025A1B09-5-GHHIIILMMOOOPRRR5SSTT



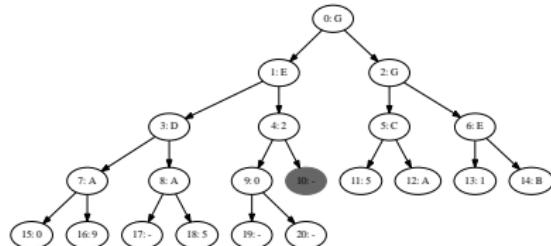
Running heapify on node 4.
Heap size: 21 Array contents: GEGGD-CEAA025A1B09-5--GHHIIILMMOOOPRRRSSSTT



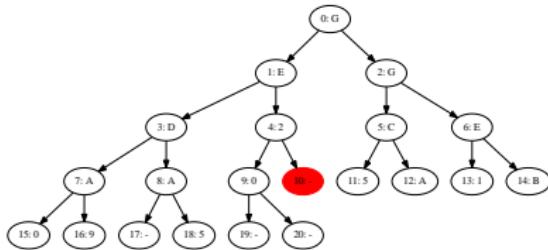
Largest of node 4 and its children is node 10.

Root and max will be swapped and heapify will recurse on the new node 10.
Heap size: 21 Array contents: GEGGDCEAABD25A1B09-5_GHHIII_MMOOPRRRSSSTT

Heap size: 21 Array contents: GEGD-CEAA025A1B09-5-GHHIILMMOOPRRRSSSTT



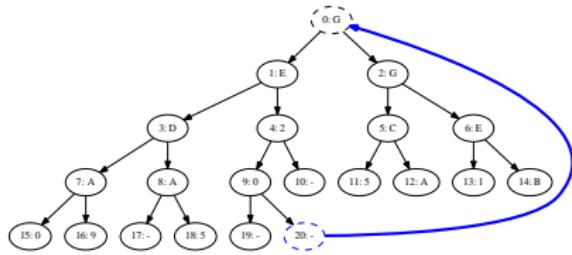
Running heapify on node 10.
Heap size: 21 Array contents: GEGD2CEAA0-5A1B09-5-GHHIIILMMOOOPRRRSSSTT



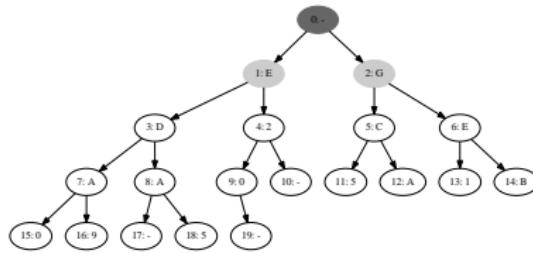
Largest of node 10 and its children is node 10.

No swap is necessary, heapify done.

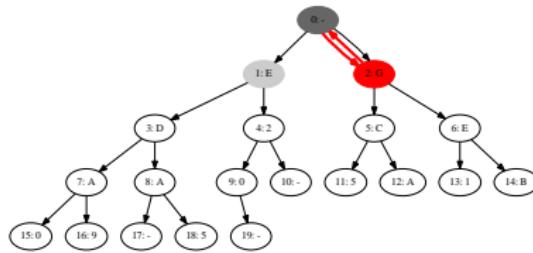
Heap size: 21 Array contents: GEHD2CEAA0-5A1B09-5-GHHHILMMOOOPRRRSSSTT



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: GEGGD2CEAA0-5A1B09-5-GHHHILMMOOOPRRRSSSTT

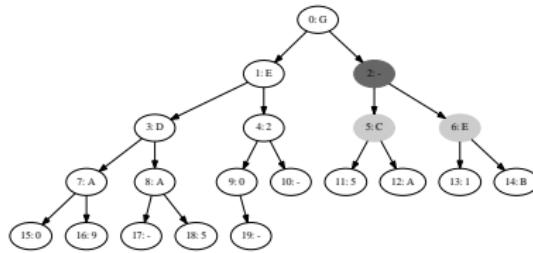


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 20 Array contents: -EGD2CEAA0-5A1B0>-5-GHHHLMMOOFRRRSSSTT

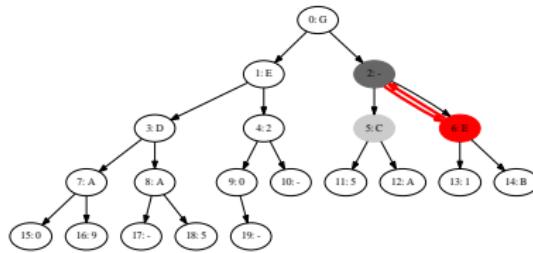


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recur on the new node 2.
Heap size: 20 Array contents: -EGIDOCCEAA6-SA1B1D9-S-GGIHHILMMOOOPRRRSSSTT

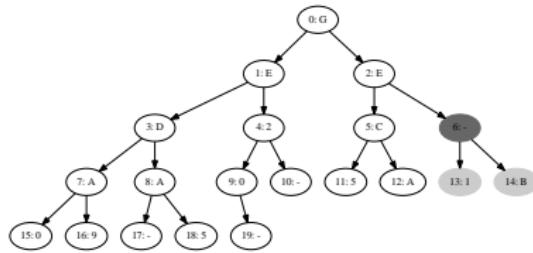


Running heapify on node 2.
Heap size: 20 Array contents: GE-D2CEAA0-5A1B09-5-GHIIHILMMOOOPRRRSSSTT

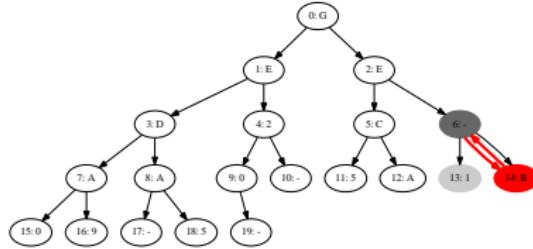


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recur on the new node 6.
Heap size: 20 Array contents: GE-DCEAAB-SAIBD9-S-GGHHLILMMOOOPRRRSSSTT

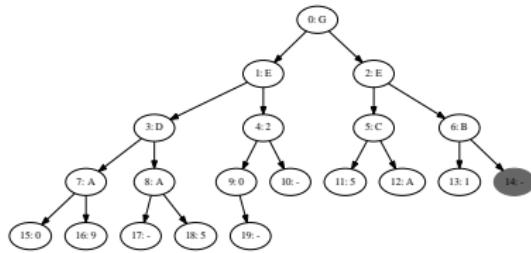


Running heapify on node 6.
Heap size: 20 Array contents: GEED2C-AA0-5A1B09-5-GGHHIIILMMOOOPRRRSSSTT

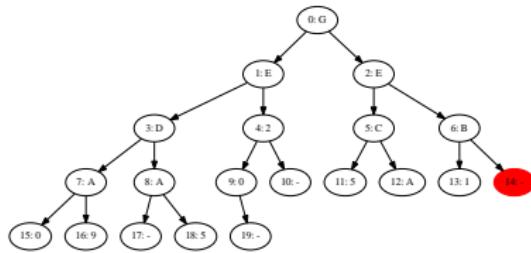


Largest of node 6 and its children is node 14.

Root and max will be swapped and heapify will recurse on the new node 14.
Heap size: 20 Array contents: GEED2C-AA0-5A1B09-5-GGHIIILMMOOOPRRRSSSTT



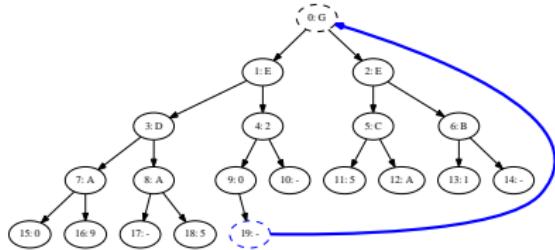
Running heapify on node 14.
Heap size: 20 Array contents: GEIJD2CBAA0-5A1-09-5-GGHHILMMOOOPRRRSSSTT



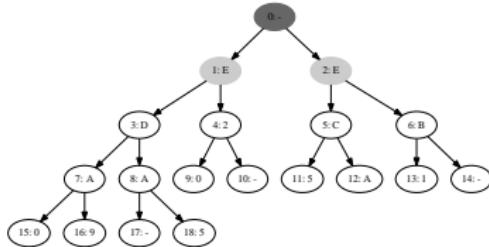
Largest of node 14 and its children is node 14.

No swap is necessary, heapify done.

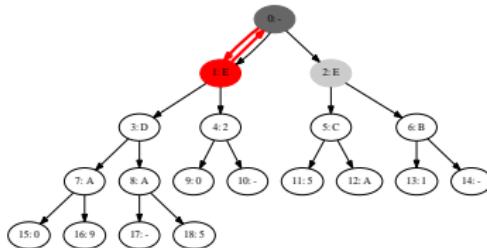
Heap size: 20 Array contents: GEED2CBAA0-5A1-09-5-GGHHHILMMOOPRRSSSTT



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: GEED2CBAA0-5A1-49-5-GGIHHILMMOOOPRRRSSSTT

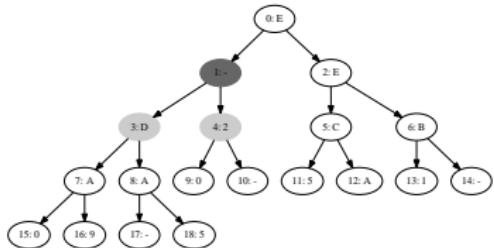


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 19 Array contents: -EED2CBAAD-5A1-09-5GGGHHLILMM4OOPRRRSSSTT

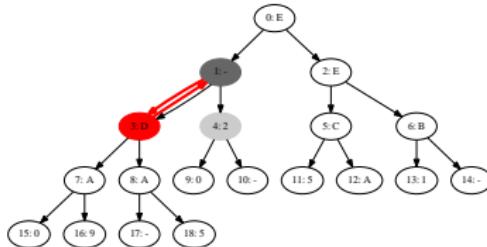


Largest of node 0 and its children is node 1

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 19 Array contents: -EED2CBAAG-SAI-09-SGGGHHLMMIOOPRRSSSTT

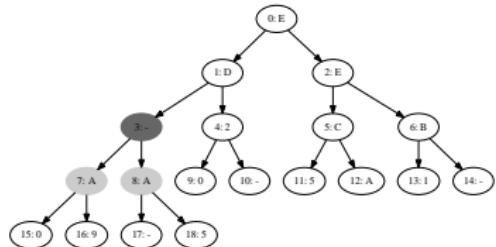


Running heapify on node 1
Heap size: 19 Array contents: E-ED2CBAAB-5A1-09-5GGGHHILMMOOOPRRRSSSTT

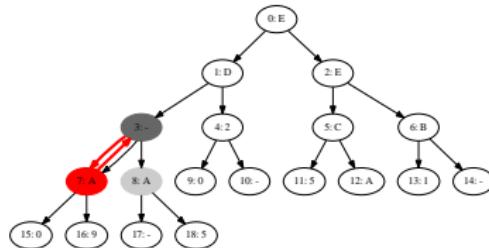


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 19 Array contents: E-ED2CBAAG-SAI-09-SGGGHHLMMIOOPRRSSSTT

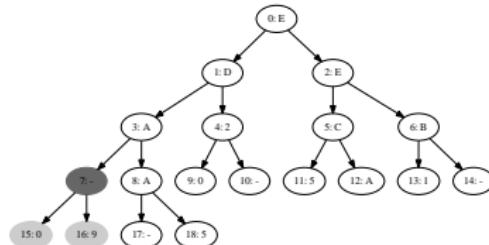


Running heapify on node 3.
Heap size: 19 Array contents: EDE-2CBAAD-5A1-09-5GGGHHILMMOOOPRRRSSSTT

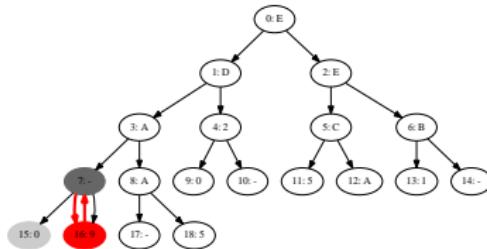


Largest of node 3 and its children is node 7.

Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 19 Array contents: EDE-2CBAAG-SAI-09-SGGGHHLMMIOOPRRRSSSTT

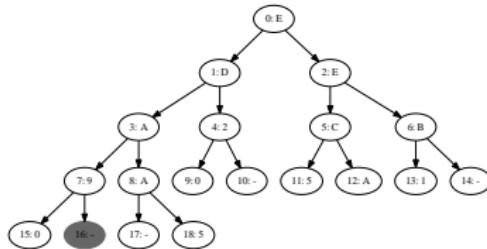


Running heapify on node 7.
Heap size: 19 Array contents: EDEA2CB-AB-5A1-09-5GGGHHILMMOOOPRRRSSSTT

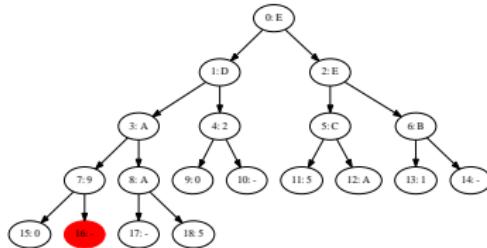


Largest of node 7 and its children is node 16.

Root and max will be swapped and heapify will recurse on the new node 16.
Heap size: 19 Array contents: EDEA2CB-AB-5A1-09-SGGGHHLMMOOOPRRSSSTT



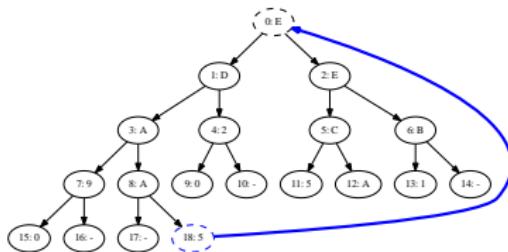
Running heapify on node 16.
Heap size: 19 Array contents: EDEA2CB9AD-5A1-0-5GGGHHILMMOOOPRRRSSSTT



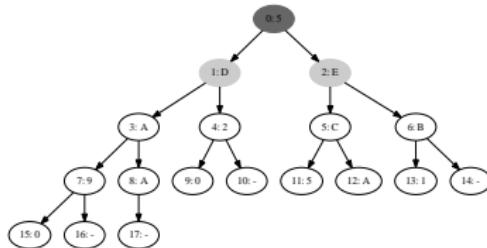
Largest of node 16 and its children is node 16.

No swap is necessary, heapify done.

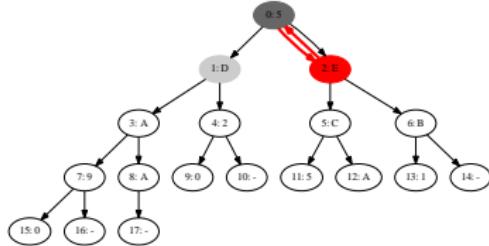
Heap size: 19 Array contents: EDEEA2CB9AB-5A1-0-5GGGHHILLMMOOOPRRRSSSTT



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: EDEEA2CB9AD-5A1-0-5GGGHHHILMMOOOPRRRSSSTT

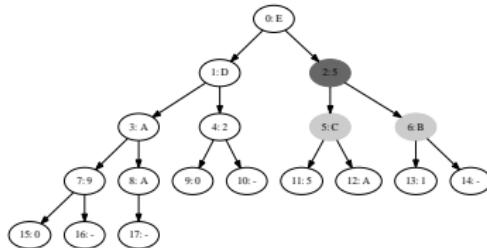


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 18 Array contents: 5DEA2CB9AD-5A1-0-EGGGHHILMM4OOPRRRSSSTT

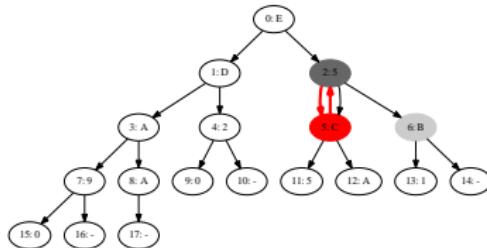


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 18 Array contents: SDEAZCBHAD-SAI-0-EGGGGHHILMMIOOPRRSSSSTT

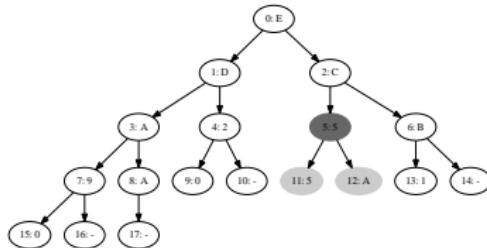


Running heapify on node 2.
Heap size: 18 Array contents: ED5A2CB9AD-5A1-0-EGGGHHHILMMOOOPRRRSSSTT

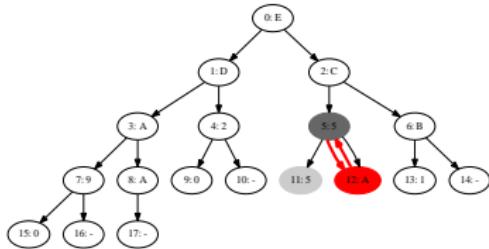


Largest of node 2 and its children is node 5.

Root and max will be swapped and heapify will recurse on the new node 5.
Heap size: 18 Array contents: ED5A2C9B4AD5A10-EGGGHHLILMMIOOPRRSSSTT

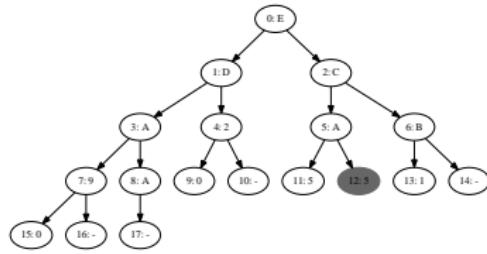


Running heapify on node 5
Heap size: 18 Array contents: EDCA25B9AD-5A1-0-EGGGHHHILMMOOOPRRRSSSTT

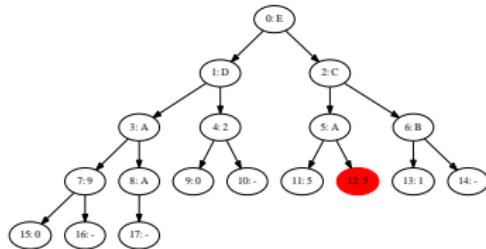


Largest of node 5 and its children is node 12

Root and max will be swapped and heapify will recurse on the new node 12.
Heap size: 18 Array contents: EDCA25BHAD-SAI-0-EGGGGHHILMMOOPRRSSSTT



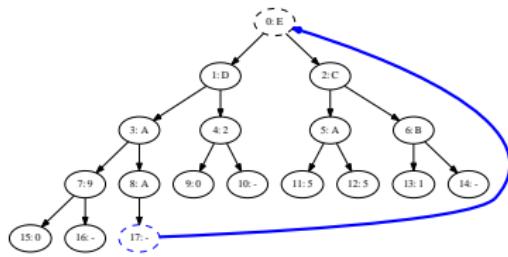
Running heapify on node 12.
Heap size: 18 Array contents: EDCAZAB9A0-551-0-EGGGHHILMMOOOPRRRSSSTT



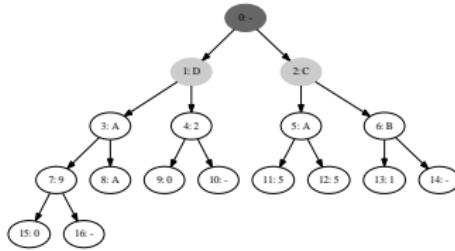
Largest of node 12 and its children is node 12.

No swap is necessary, heapify!

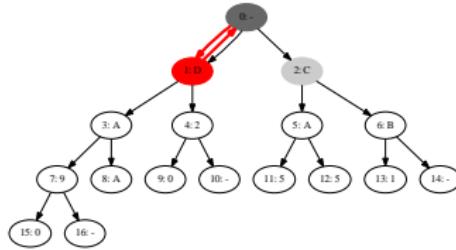
Heap size: 18 Array contents: EDCAZAB@0-551-0-EGGGHHILLMMOOPRRSSSTT



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: EDCAZAB@0-551-0-EGGGHHILMMOOOPRRRSSSTT

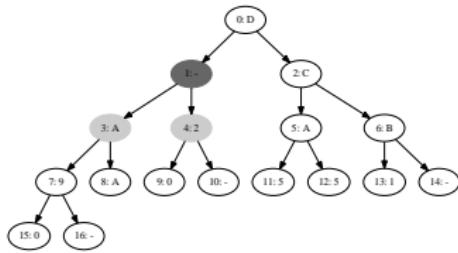


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 17 Array contents: -DCA2AB9AD-551-0-EEGGGHHILMM4OOFRRRSSSTT

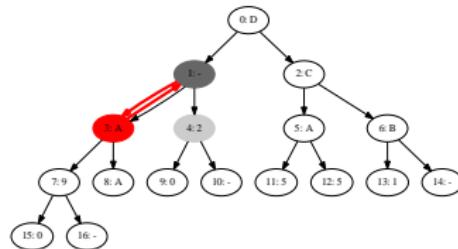


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 17 Array contents: -DCAZAB9AD-551-0-EFGGGHHHLMMIOOPRRSSSTT

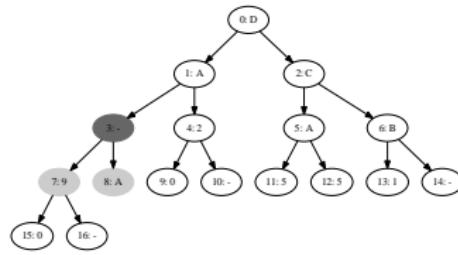


Running heapify on node 1.
Heap size: 17 Array contents: D-CA2AB%AD-551-D-EFGGGGHHILMMOOOPRRRSSSTT

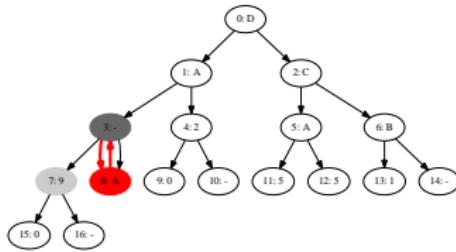


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 17 Array contents: D-CABAB9AD-551-0-EFGGGHHILMMIOOPRRSSSTT

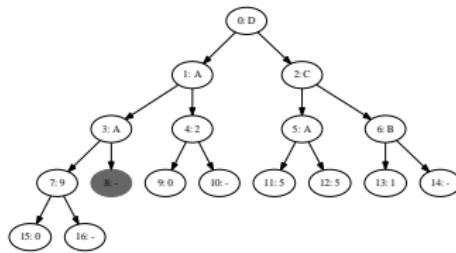


Running heapify on node 3.
Heap size: 17 Array contents: DAC-2AB9AD-551-D-EFGGGGHHILMMOOOPRRRSSSTT

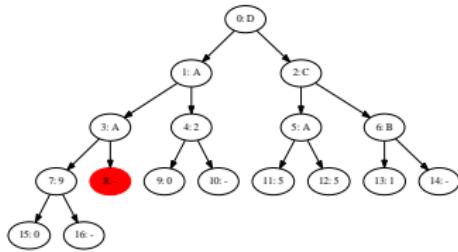


Largest of node 3 and its children is node 8.

Root and max will be swapped and heapify will recurse on the new node 8.
 Heap size: 17 Array contents: DAC-2AB9AD-551-0-EFGGGHHHLMMIOOPRRSSSTT



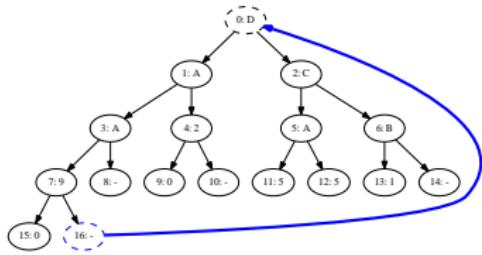
Running heapify on node 8
Heap size: 17 Array contents: DACAA2AB9-0-551-0-EEGGGGHHILMMOOOPRRRSSSTT



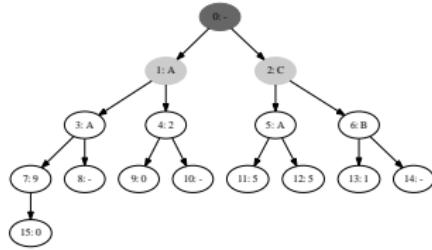
Largest of node 8 and its children is node 8.

No swap is necessary, heapify done.

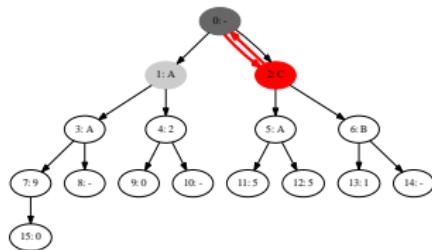
Heap size: 17 Array contents: DACAZAB9-0-551-0-EFGGGHHHILMMOOOPRRRSSSTT



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: DACAZAB9-0-551-0-EFGGGHHILMMOOOPRRRSSSTT

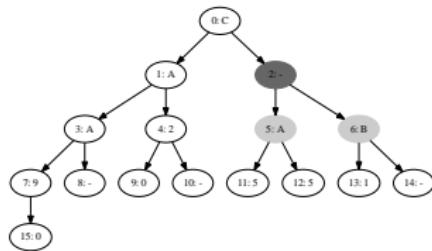


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 16 Array contents: -ACAB2A9-0-551-0DEEGGGHHHILMM4OOOPRRRSSSTT

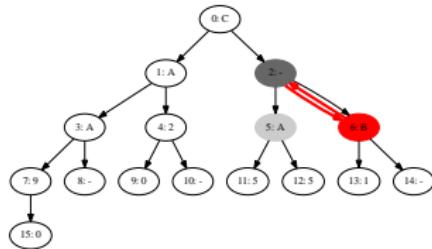


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 16 Array contents: -ACAZAB9-0-551-0DEEEGGGHHLILMMIOOPRRSSSTT

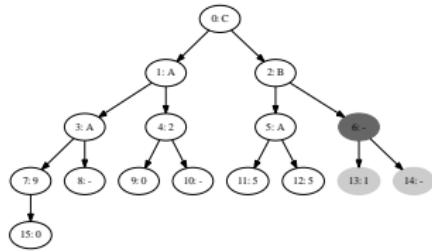


Running heapify on node 2.
Heap size: 16 Array contents: CA-A2AB9-0-551-0DEEEGGGHHILMMOOOPRRRSSSTT

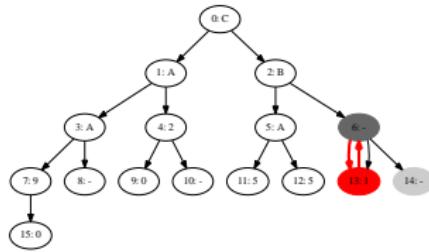


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 16 Array contents: CA-AzABy9-0-551-0DEEEGGGHHILMMIOOPRRSSSTT

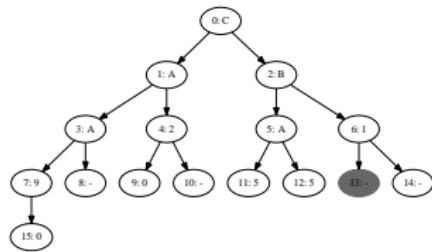


Running heapify on node 6.
Heap size: 16 Array contents: CABABA-9-0-551-0DEEEGGGGHHHILMMMOOPRRRSSSTT

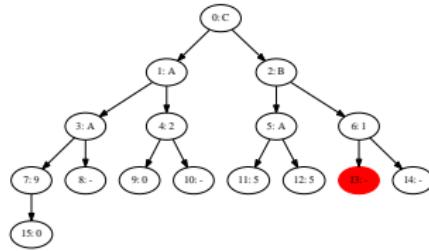


Largest of node 6 and its children is node 13.

Root and max will be swapped and heapify will recurse on the new node 13.
Heap size: 16 Array contents: CABAB2A-9-0-551-0DEEEGGGGHHHILMMMOOPRRRSSSTT



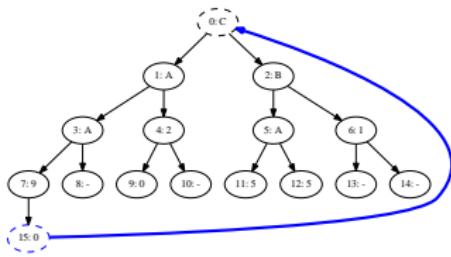
Running heapify on node 13.
Heap size: 16 Array contents: CABABAA9-0-55-0DEEEGGGHHHILMMOOOPRRRSSSTT



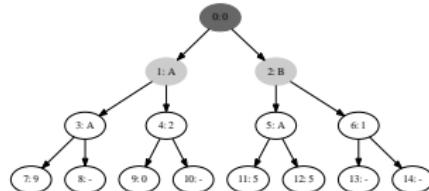
Largest of node 13 and its children is node 13.

No swap is necessary; heapify done.

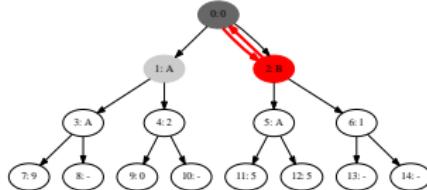
Heap size: 16 Array contents: CABABA19-0-55-0DEEEGGGHIIILMMOOOPRRRSSSTT



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: CABABA9-0-55-0DEEEGGGHHHILMMOOOPRRRSSSTT

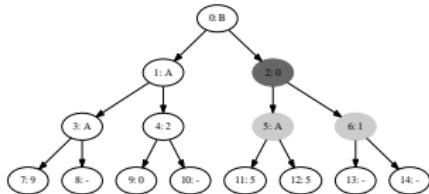


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 15 Array contents: 0ABA2A19-0-55-CDEEGGGHHHILMMOOOPRRRSSSTT

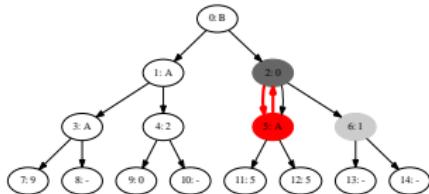


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 15 Array contents: 0ABA2A19-0-55-CDEEGGGHHHILMMOOOPRRRSSSTT

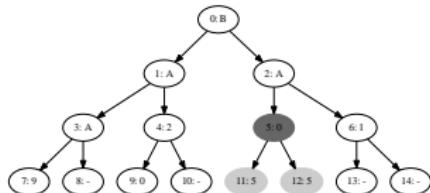


Running heapify on node 2.
Heap size: 15 Array contents: BA0A2A19-0-55- CDEEGGGHHHILLMMOOOPRRRSSSTT

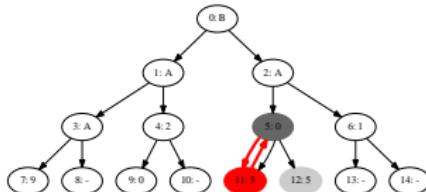


Largest of node 2 and its children is node 5.

Root and max will be swapped and heapify will recurse on the new node 5.
Heap size: 15 Array contents: BA0A2A19-0-55-CDEEGGGHHHILMMOOOPRRRSSSTT

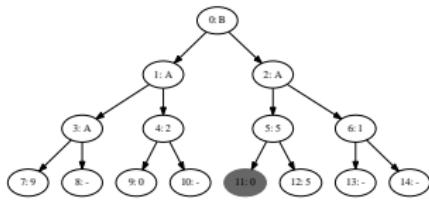


Running heapify on node 5.
Heap size: 15 Array contents: BAAA2019-0-55--CDEEGGGHHHILLMMOOOPRRRSSSTT

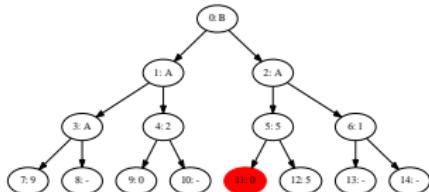


Largest of node 5 and its children is node 11.

Root and max will be swapped and heapify will recurse on the new node 11.
Heap size: 15 Array contents: BAAAA2019-0-55-CDEEEGGGHHHHILMMOOOPRRRSSSTT



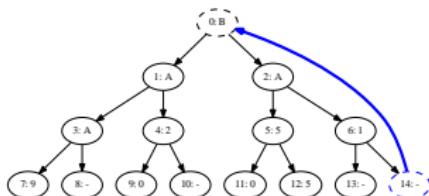
Running heapify on node 11.
Heap size: 15 Array content: BAAA2519-0-05-CDEEGGGHHHILMMOOOPRRRSSSTT



Largest of node 11 and its children is node 11.

No swap is necessary, heapify done.

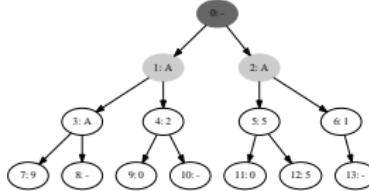
Heap size: 15 Array contents: BAAAZ519-0-05-CDEEGGGHHHILMMOOOPRRRSSSTT



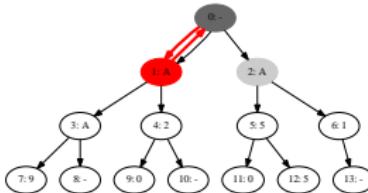
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 15 Array contents: BAAA2519-0-05-CDEEGGGHHHILMMOOOPRRRSSSTT

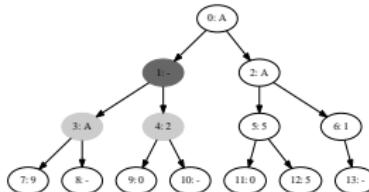


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 14 Array contents: -AAA2519-0-05-BCDIEGGGGHHILMMOOOPRRRSSSTT

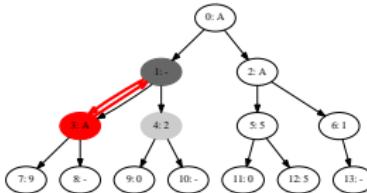


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 14 Array contents: -AAA2519-0-05-BCDDEGGGHHHILMMOOOPRRRSSSTT

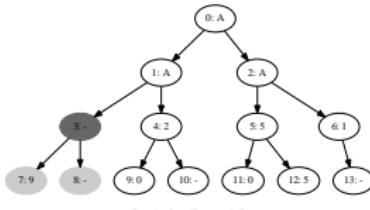


Running heapify on node 1.
Heap size: 14 Array contents: A-AA2519-0-05-BCDEGGGHHILMMOOOPRRRSSSTT

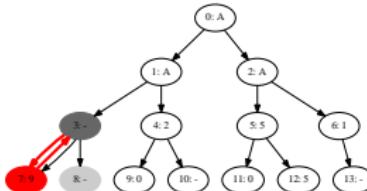


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 14 Array contents: A-AA2519-0-05-BCDDEGGGHHHILMMOOOPRRRSSSTT

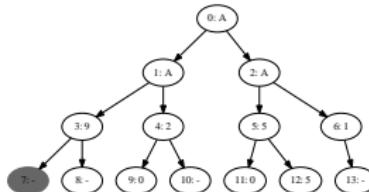


Running heapify on node 3.
Heap size: 14 Array contents: AAA_2519-0-05-BCDEGGGHHILMMOOOPRRSSSTT

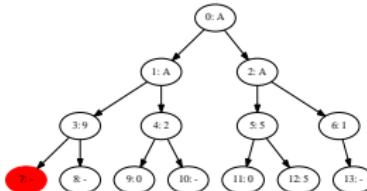


Largest of node 3 and its children is node 7.

Root and max will be swapped and heapify will recurse on the new node 7.
Heap size: 14 Array contents: AAA-2519-0-05-BCDEEGGHHHILMMOOOPRRSSSTT



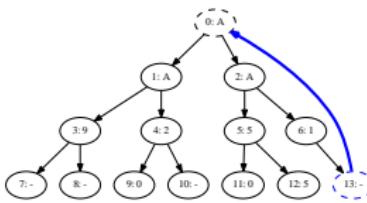
Running heapify on node 7.
Heap size: 14 Array contents: AAA9251-0-05-BCDEGGGHHILMMOOOPRRSSSTT



Largest of node 7 and its children is node 7.

No swap is necessary, heapify done.

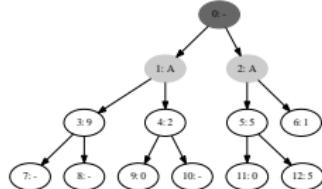
Heap size: 14 Array contents: AAA9251-0-05-BCDDEEGGGHHHILMMOOOPRRRSSSTT



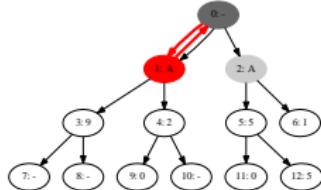
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 14 Array contents: AAA9251-0-05-BCDDEGGGHHLMMOOOPRRRSSSTT

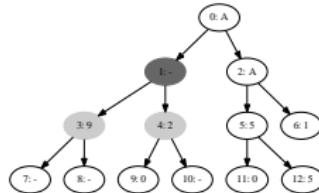


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 13 Array contents: -AA9251-0-05ABCDEGGGHILLMMOOOPRRRSSSTT

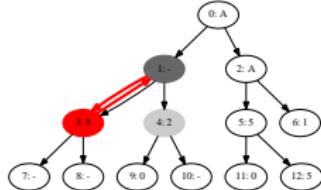


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 13 Array contents: -AA9251-0-05ABCDEEGGHHHILMMOOOPRRRSSSTT

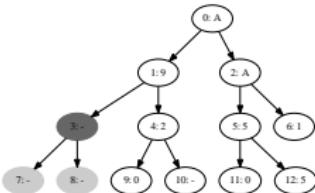


Running heapify on node 1.
Heap size: 13 Array contents: A-A9251-0-05ABCDEGGGHHLMMOOPIRRSSSTT

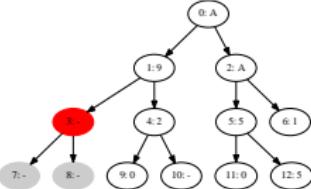


Largest of node 1 and its children is node 3.

Root and max will be swapped and heapify will recurse on the new node 3.
Heap size: 13 Array contents: A-A9251-0-05ABCDEEGGHHHILMMOOOPRRRSSSTT



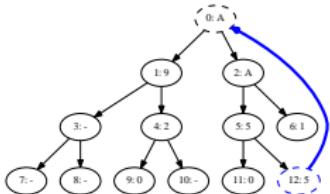
Running heapify on node 3.
Heap size: 13 Array contents: A9A-251-0-05ABCDEGGGHHILMMOOOPRRRSSSTT



Largest of node 3 and its children is node 3.

No swap is necessary, heapify done.

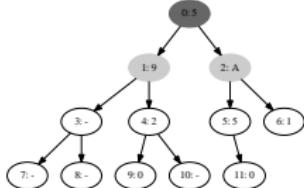
Heap size: 13 Array contents: A9A-251-0-05ABCDEEEGGGGHHHILMMOOOPRRRSSSSTT



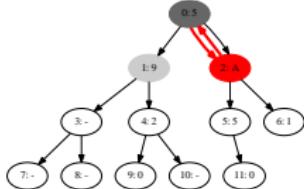
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 13 Array contents: A9A-251-0-05ABCDEFEGGHHILMMOOOPRRRSSSTT

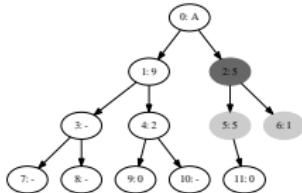


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 12 Array contents: 59A-251-0-0AABCDIEGGGGHHILMMOOOPRRRSSSTT

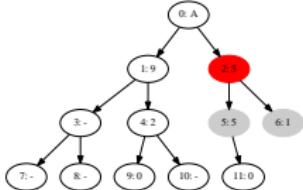


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 12 Array contents: 59A-251-0-AABC1DEEGGHHHILMMOOOPRRRSSSTT



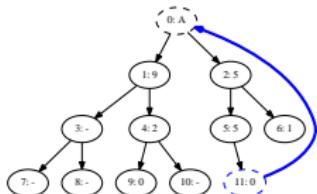
Running heapify on node 2.
Heap size: 12 Array contents: A95-251-0-0ABCDEFGGGHILLMMOOPRRRSSSTT



Largest of node 2 and its children is node 2.

No swap is necessary, heapify done.

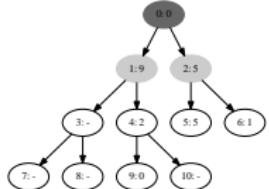
Heap size: 12 Array contents: A95-251-0-0AABCDEFEGGGHHHILMMOOOPRRRSSSTT



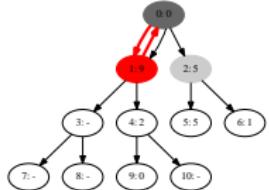
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 12 Array contents: A95-251-0-0ABCDEFEGGHHLMMOOOPRRRSSSTT

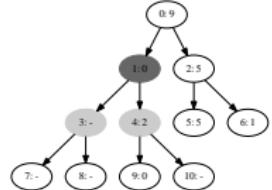


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 11 Array contents: 095-251-0-AAABCDIEGGGGHHILMMOOOPRRRSSSTT



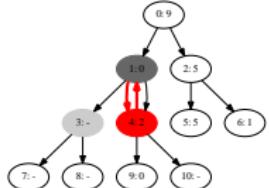
Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 11 Array contents: 095-251-0-AAABCDEEGGGHHHILMMOOOPRRRSSSTT



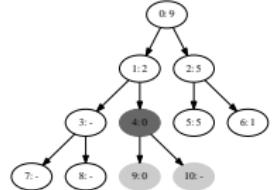
Running heapify on node 1.

Heap size: 11 Array contents: 905-251-0-AAABCDIEGGGGHHILMMOOOPRRRSSSTT



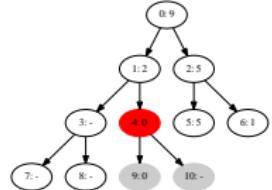
Largest of node 1 and its children is node 4.

Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 11 Array contents: 905-251-0-AAABCDEEGGGHHHILMMOOOPRRRSSSTT



Running heapify on node 4.

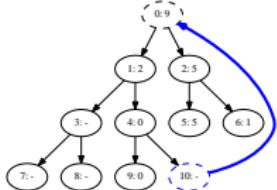
Heap size: 11 Array contents: 925.051.-.AAABCDEEGGGHHILMMOOOPRRSSSTT



Largest of node 4 and its children is node 4.

No swap is necessary, heapify done.

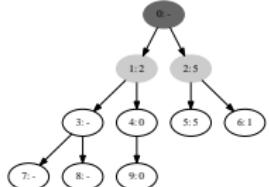
Heap size: 11 Array contents: 925-051-0-AAABCDEEEGGGHHHILMMOOOPRRRSSSTT



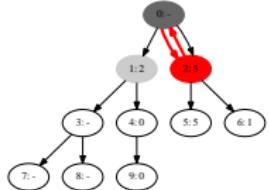
Removing root and moving its outside the heap.

The last element takes its place and the heap size is decremented.

Heap size: 11 Array contents: 925-051-0-AAABCDEEEGGGHHLMMOOOPRRRSSSTT

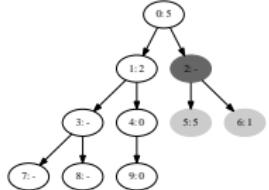


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 10 Array contents: -25-051-09AAABCDEFGGGHHILMMOOOPRRRSSSTT



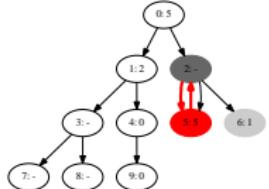
Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 10 Array contents: -25-051-09AAABCDEEGGGHHHILMMOOOPRRRSSSTT



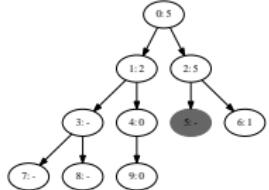
Running heapify on node 2.

Heap size: 10 Array contents: 52-051-09AAABCDEFGGGHHILMMOOOPRRRSSSTT



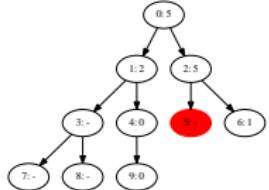
Largest of node 2 and its children is node 5.

Root and max will be swapped and heapify will recurse on the new node 5.
Heap size: 10 Array contents: 52--051--09AAABCDEEGGGHHHILMMOOOPRRRSSSTT



Running heapify on node 5.

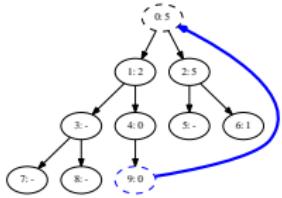
Heap size: 10 Array contents: 525-0-1-09AAABCDEFGGGHHILMMOOOPRRRSSSTT



Largest of node 5 and its children is node 5.

No swap is necessary, heapify done.

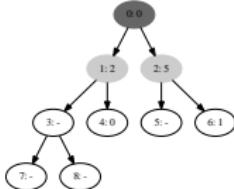
Heap size: 10 Array contents: 525-0-1-09AAABCDEEEGGGHHHILMMOOOPRRRSSSTT



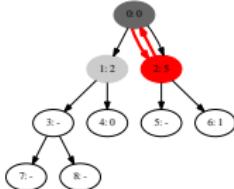
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 10 Array contents: 525-0-1-09AAABCDEEFGGHHILMMOOOPRRRSSSTT

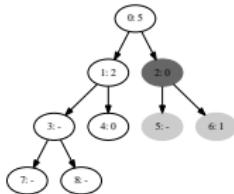


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 9 Array contents: 025-0-1-59AAABCDDEEGGGHHILMMOOPRRRSSSTT

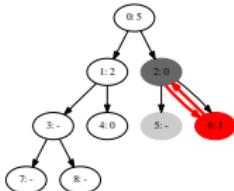


Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 9 Array contents: 025-0-1-59AAABCD~~E~~GGGHILMMOOPRRSSSTT

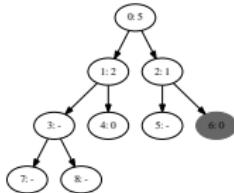


Running heapify on node 2.
Heap size: 9 Array contents: 520-0-1-59AABCDDEEGGGGHILMMOOPRRRSSSTT

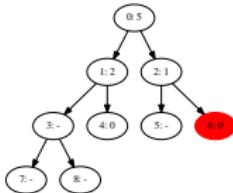


Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 9 Array contents: 520-0-1-59AAABCDEGGGHHLMMOOPRRRSSSTT



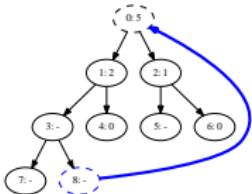
Running heapify on node 6.
Heap size: 9 Array contents: 521-0-59AAABCDEGGGHILMMOOPRRRSSSTT



Largest of node 6 and its children is node 6.

No swap is necessary, heapify done.

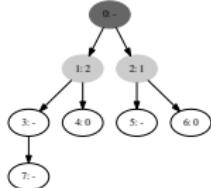
Heap size: 9 Array contents: 521-0-0-59AAABCD~~E~~GGGHILMMOO~~P~~RRRSSSTT



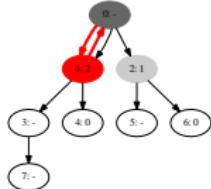
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 9 Array contents: 521-0-0-59AAABCDIEEGGGHHILMMOOOPRRRSSSTT

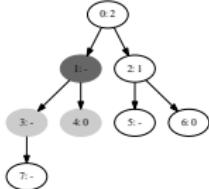


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 8 Array contents: -21-0-0-559AAABCD~~EFGGH~~HILMMOOPRRSSSTT

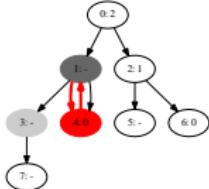


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 8 Array contents: -21-0-0-559AAABCDEGGGHHLMMOOPRRRSSSTT

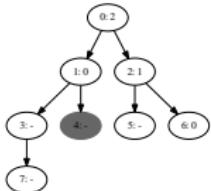


Running heapify on node 1.
Heap size: 8 Array contents: 2-1-0-0-559AAABCDEGGGHILMMOOPRRRSSSTT

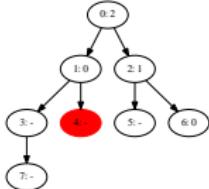


Largest of node 1 and its children is node 4.

Root and max will be swapped and heapify will recurse on the new node 4.
Heap size: 8 Array contents: 2-1-0-0-559AAABCDEGGGHHLMMOOPRRRSSSTT



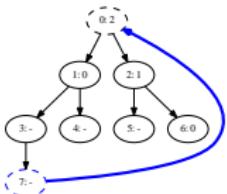
Running heapify on node 4.
Heap size: 8 Array contents: 201—0-559AAABCDEGGGHILMMOOPRRRSSSTT



Largest of node 4 and its children is node 4.

No swap is necessary, heapify done.

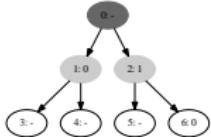
Heap size: 8 Array contents: 201-0-559AAABCD~~E~~GGGH~~I~~LM~~M~~OOPRRRSSSTT



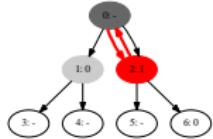
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 8 Array contents: 201—0-559AAABCD~~E~~GGGHILMMOOOPRRRSSSTT

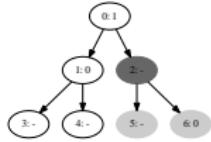


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 7 Array contents: -01-02559AAABCDEEGOGHHLMMOOPRRRSSSTT



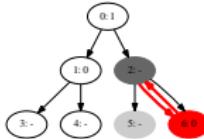
Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 7 Array contents: -01--02559AAABCDIEEGOGHHILMMOOPRRSSSTT



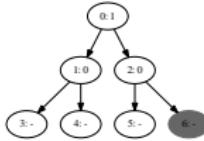
Running heapify on node 2.

Heap size: 7 Array contents: 10—02559%AAABCDEEGGOGHHILMMOOPRRRSSSTT



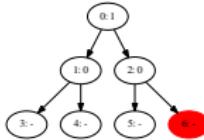
Largest of node 2 and its children is node 6.

Root and max will be swapped and heapify will recurse on the new node 6.
Heap size: 7 Array contents: 10---02559AAABCDIEEGOGHHLMMOOPRRRSSSTT



Running heapify on node 6.

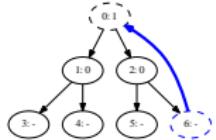
Heap size: 7 Array contents: 100—255%AAABCDEEGGOGHHILMMOOPRRRSSSTT



Largest of node 6 and its children is node 6.

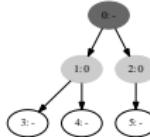
No swap is necessary, heapify done.

Heap size: 7 Array contents: 100—2559AAABCDEEGOGHHILMMOOOPRRRSSSTT

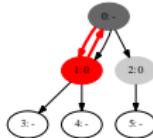


Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.
Heap size: 7 Array contents: 100—255%AAABCDEEGOGHHLMMOOPRRRSSSTT

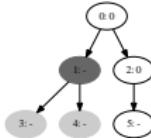


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 6 Array contents: -0—12559AAABCDEEGOGHHLMMOOPRRRSSSTT

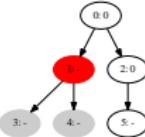


Largest of node 0 and its children is node 1.

Root and max will be swapped and heapify will recurse on the new node 1.
Heap size: 6 Array contents: -00---12559AAABCDIEEGOGHHLMMOOOPRRRSSSTT



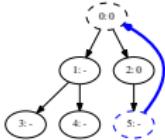
Running heapify on node 1.
Heap size: 6 Array contents: 0-0-12559AAABCDEEGOGHHILMMOOPRRRSSSTT



Largest of node 1 and its children is node 1.

No swap is necessary, heapify done.

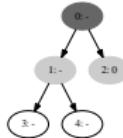
Heap size: 6 Array contents: 0:0--12559AAABCDEEGOGHHILMMOOOPRRRSSSTT



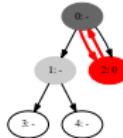
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 6 Array contents: 0:0—12559AAABCDEEGOGHHLMMOOPRRRSSSTT

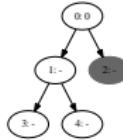


Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 5 Array contents: -0-012559AAABCDDEEGOGHHLMMOOPRRRSSSTT



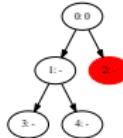
Largest of node 0 and its children is node 2.

Root and max will be swapped and heapify will recurse on the new node 2.
Heap size: 5 Array contents: -0-012559AAABCDIEEGOGHHLMMOOPRRRSSSTT



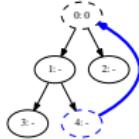
Running heapify on node 2.

Heap size: 5 Array contents: 0—012559%AAABCDEEGOGHHILMMOOPRRRSSSTT



Largest of node 2 and its children is node 2.
No swap is necessary, heapify done.

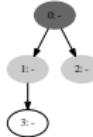
Heap size: 5 Array contents: 0—012559AAABCDDEEGOGHHILMMOOOPRRRSSSTT



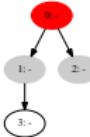
Removing root and moving it outside of the heap.

The last element takes its place and the heap size is decremented.

Heap size: 5 Array contents: 0—012559AAABCDDEEGOGHHLMMOOPRRRSSSTT



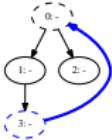
Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 4 Array contents: ---0012559AAABCDEEGOGGHILMMOOPRRRSSSTT



Largest of node 0 and its children is node 0.

No swap is necessary, heapify done.

Heap size: 4 Array contents: ---0012559AAABCDDEEGOGHHLMMOOOPRRRSSSTT



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: ---0012559AAABCD EEE GOGH HILMM OOPRRR SSSSTT



Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 3 Array contents: ---0012559AAABCDEE:GGGHHLMMOOOPRRRSSSTT



Largest of node 0 and its children is node 0.

No swap is necessary, heapify done.

Heap size: 3 Array contents: ---0012559AAABCDEE/GGGHHILMMOOPRRRSSSTT



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: ---01255%AAABCDEEEGGGHHILMMOOOPRRRSSSTT



Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 2 Array contents: ---0012559AAABCDEE:GGGHHLMMOOOPRRRSSSTT



Largest of node 0 and its children is node 0.

No swap is necessary, heapify done.

Heap size: 2 Array contents: ---0012559AAABCDEE/GGGHHILMMOOPRRRSSSTT



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: ---01255%AAABCDEEGGGHHILMMOOPRRRSSSTT

0

Running heapify on node 0 as part of the repair heap (heap-down) process.
Heap size: 1 Array contents: —0012559AAABCDEEFGGHHILMMOOPRRRSSSTT

0 ←

Largest of node 0 and its children is node 0.

No swap is necessary, heapify done.

Heap size: 1 Array contents: ---0012559AAABCDEEGGGHHILMMOOPRRRSSSTT

Heap empty, sorting complete.
Heap size: 0 Array contents: ---0012559AAABCDDEEGGGHIIILMMOOPRRSSSTT