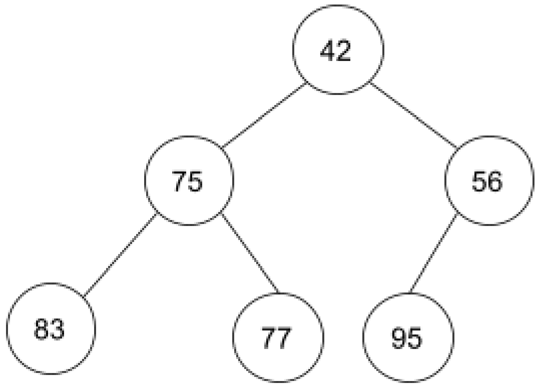
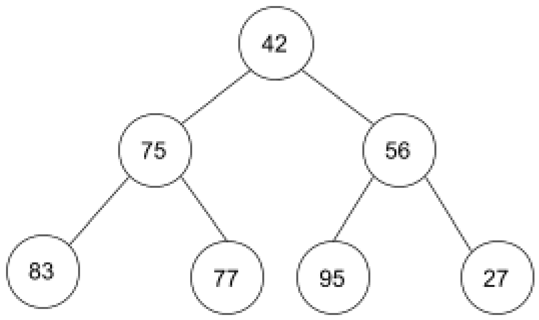
Adam Ridhwan Amir Hamzah - Assignment 6

Problem 1

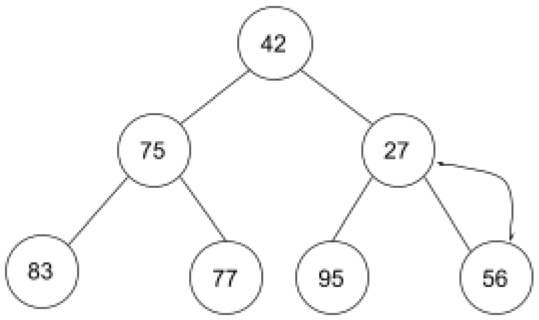


Inserting key entry = 27

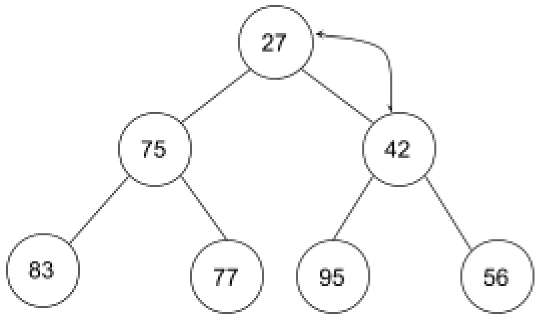
Step 1:
27 is added to the last position of the heap
Compare 27 with its parent (56)



Step 2:
27 < 56, they are swapped.
Compare 27 with its new parent (42)



Step 3:
27 < 42, they are swapped.



- ❖ Final heap

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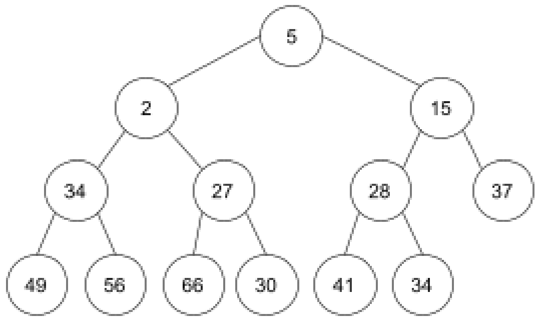
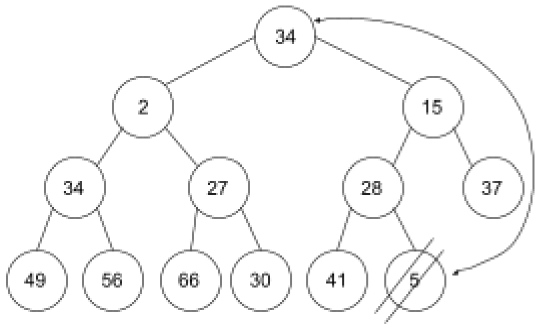
Problem 2

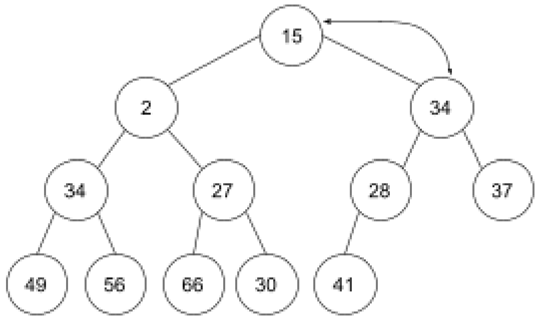


removeMin() is performed

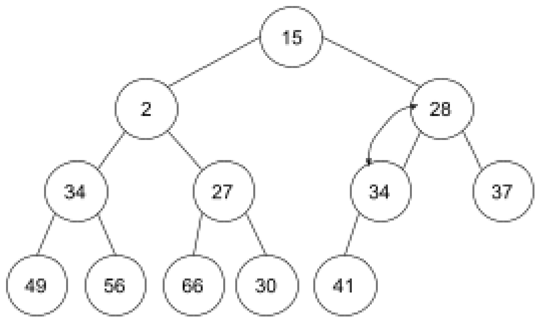
Step 1: -
5 is swapped with 34 (last element)
5 is then deleted and size is decreased by 1



Step 2: -
The heap property is not satisfied because 34 is not the smallest element. Therefore, 15 is swapped with 34. After swap, the heap is still not satisfied.



Step 3: -



28 is swapped with 34.

- ❖ Final heap

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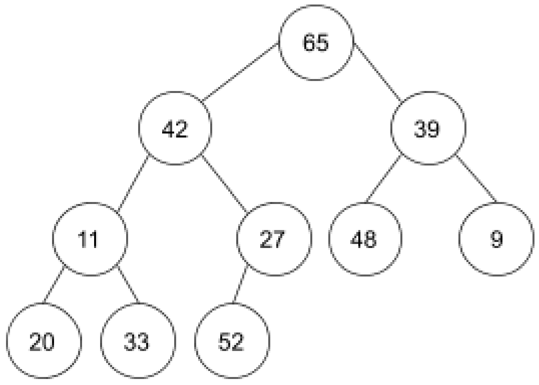
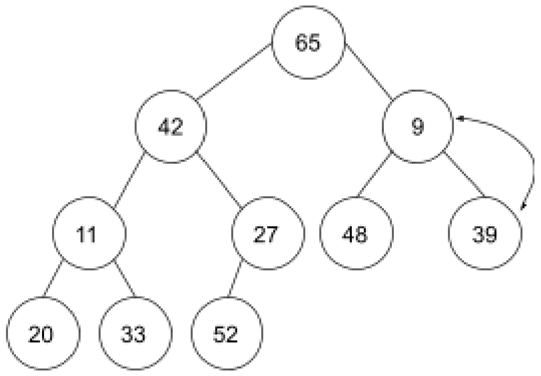
Problem 3

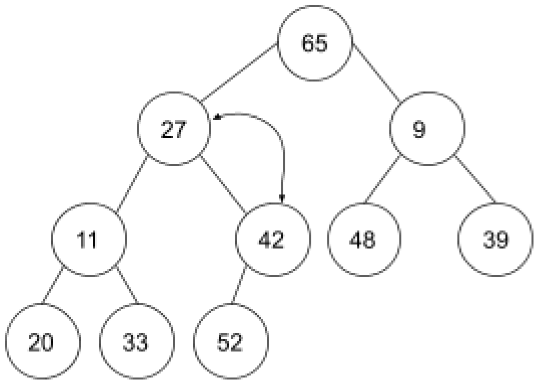
Initial heap: -



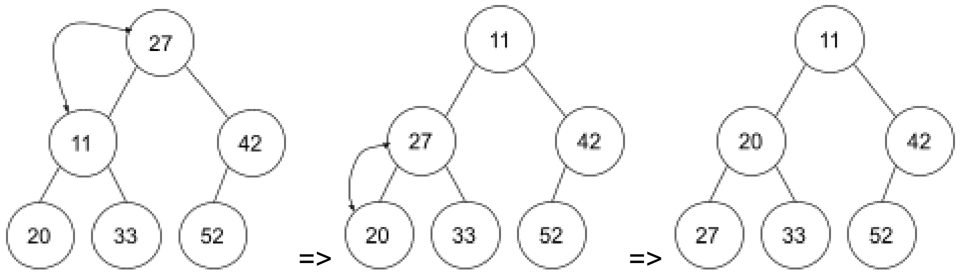
Step 1: -
9 will be swapped with 39



Step 2: -
27 will be swapped with 42



Step 3: -
Left subtree: -



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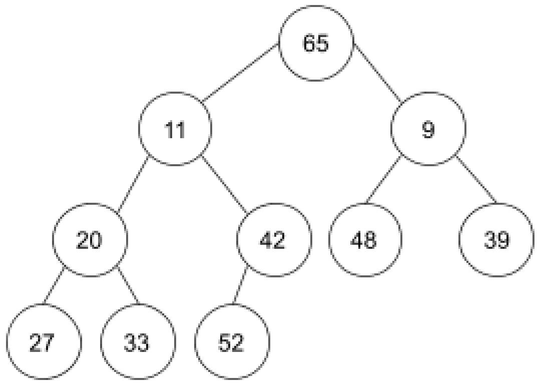
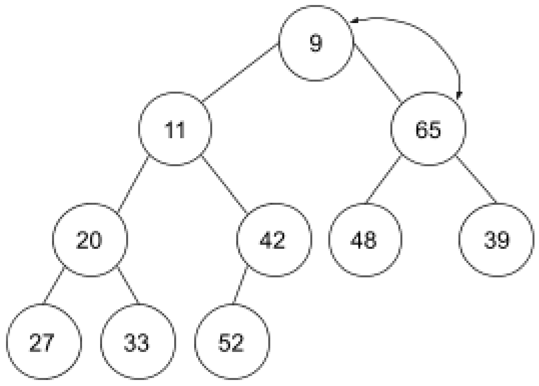
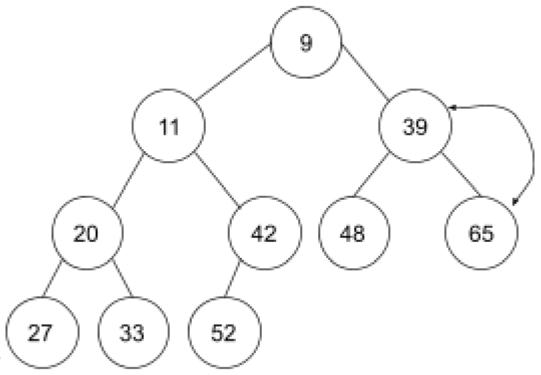
The resulting heap will be : -



Step 4: -
9 <65, they are swapped



=>



- Final heap

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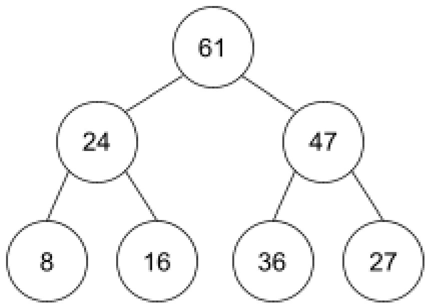
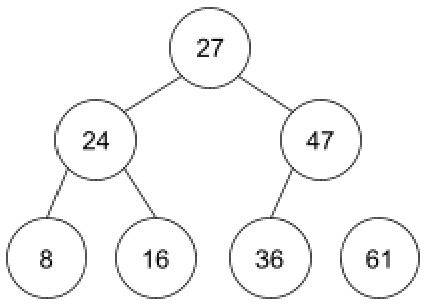
Problem 4
Initial heap: -

0	1	2	3	4	5	6
61	24	47	8	16	36	27



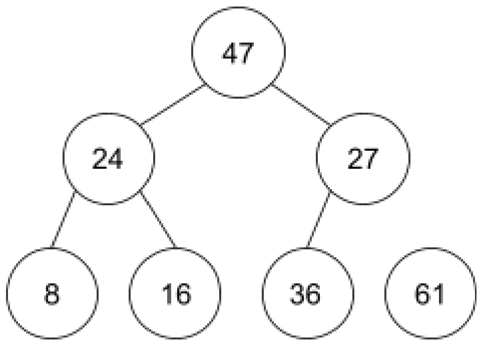
Step 1: -
First element and last element are swapped

0	1	2	3	4	5	6
27	25	47	8	16	36	61



Step 2: -
First element and last element are swapped

0	1	2	3	4	5	6
47	24	27	8	16	36	61



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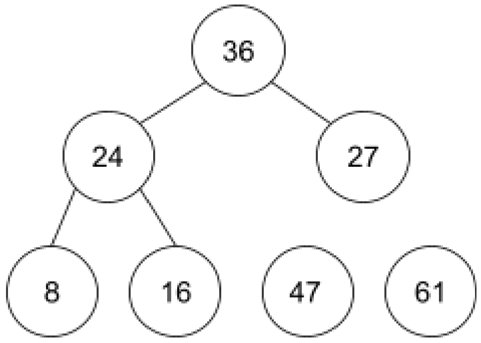
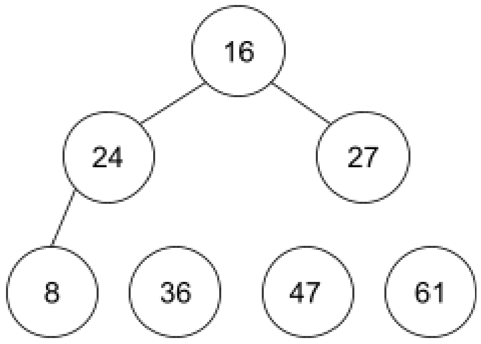
Step 3: -
Swap 36 and 47

0	1	2	3	4	5	6
36	24	27	8	16	47	61



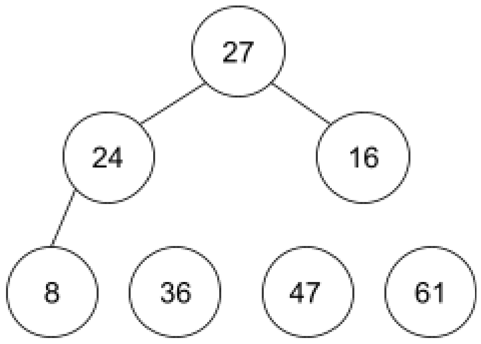
Step 4: -
16 and 36 are swapped

0	1	2	3	4	5	6
16	24	27	8	36	47	61



Step 5: -
16 and 27 are swapped

0	1	2	3	4	5	6
27	24	16	8	36	47	61



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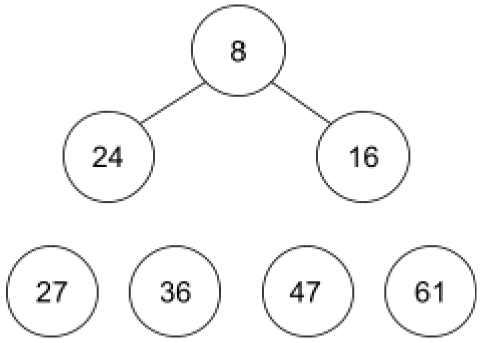
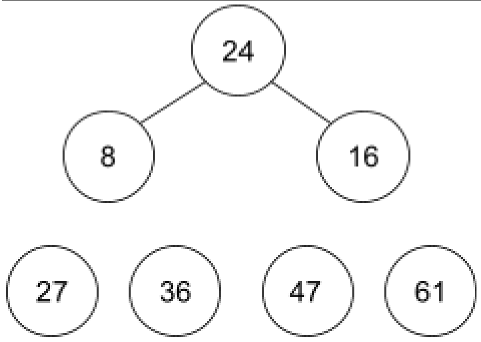
Step 6: -
8 and 27 are swapped

0	1	2	3	4	5	6
8	24	16	27	36	47	61



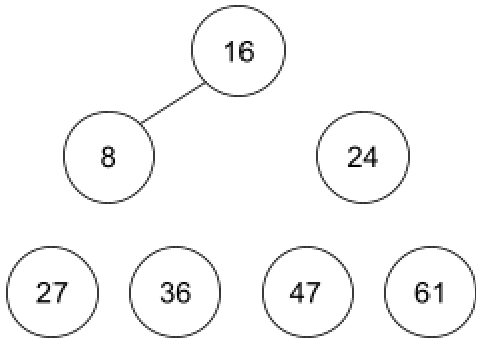
Step 7: -
24 and 8 are swapped

0	1	2	3	4	5	6
24	8	16	27	36	47	61



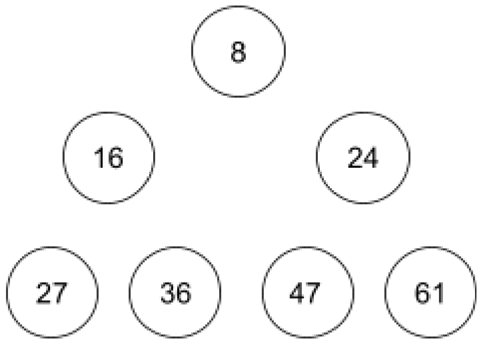
Step 8: -
16 and 24 are swapped

0	1	2	3	4	5	6
16	8	24	27	36	47	61



Step 9: -
8 and 16 are swapped

0	1	2	3	4	5	6
8	16	24	27	36	47	61



- ❖ Final tree & array