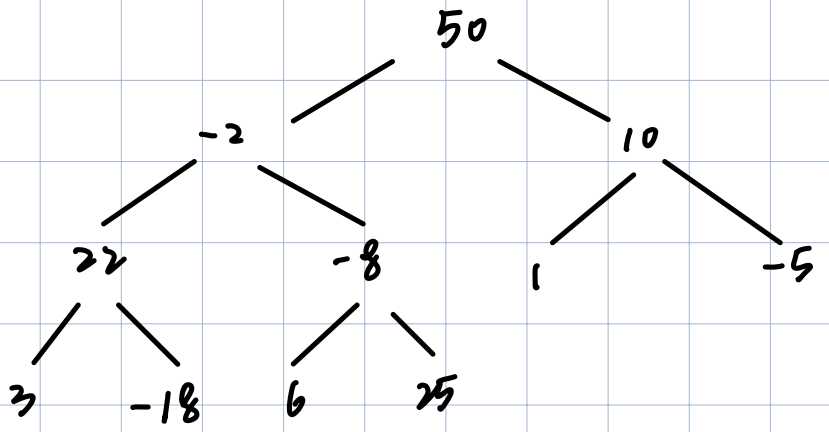
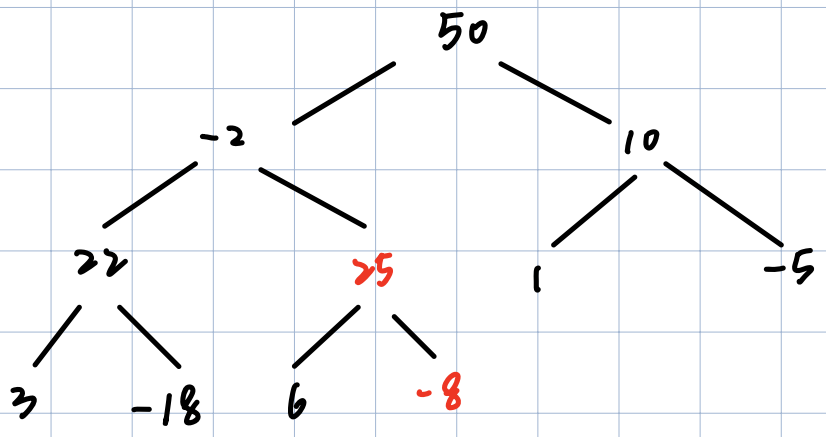
Given Array: [50, -2, 10, 22, -8, 1, -5, 3, -18, 6, 25]

Build Max Heap:

Step 1: form a tree Size = 11



Step 2: starting from size/2 to 1, sink every element.

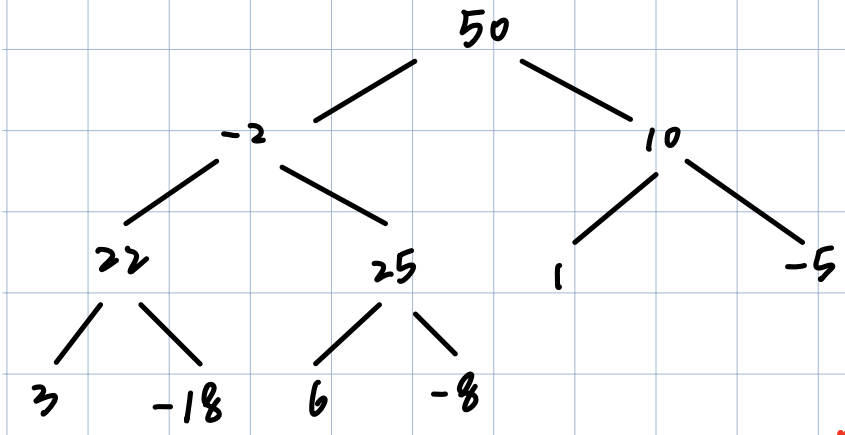


the 5th element is -8.

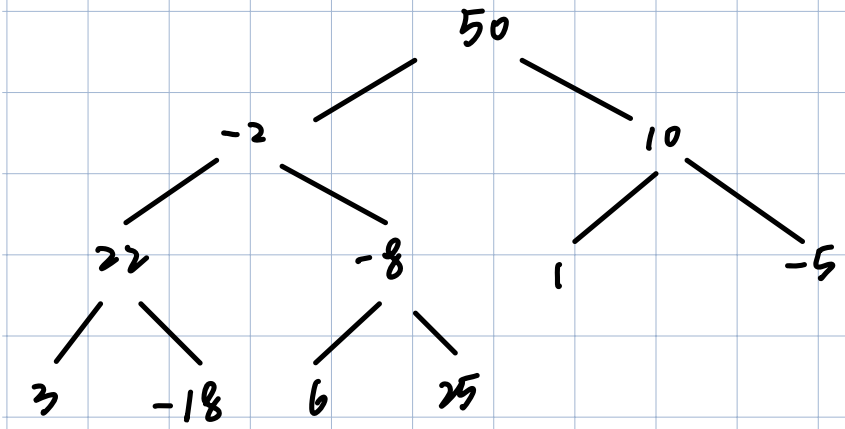
among -8, 6, 25

25 is the largest.

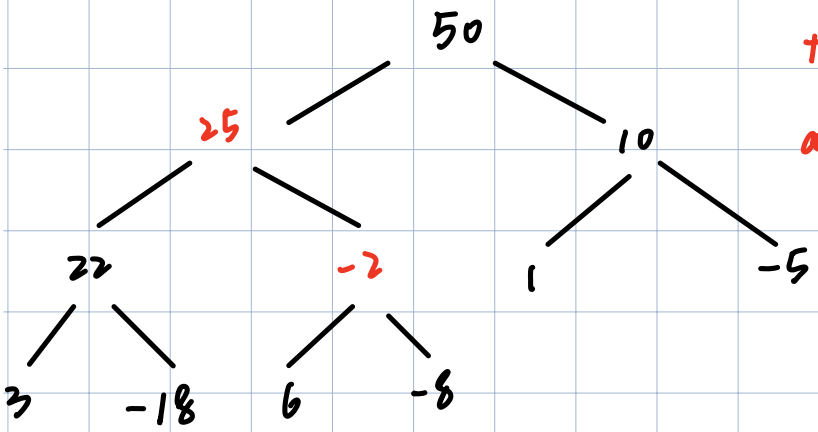
so switch -8 and 25



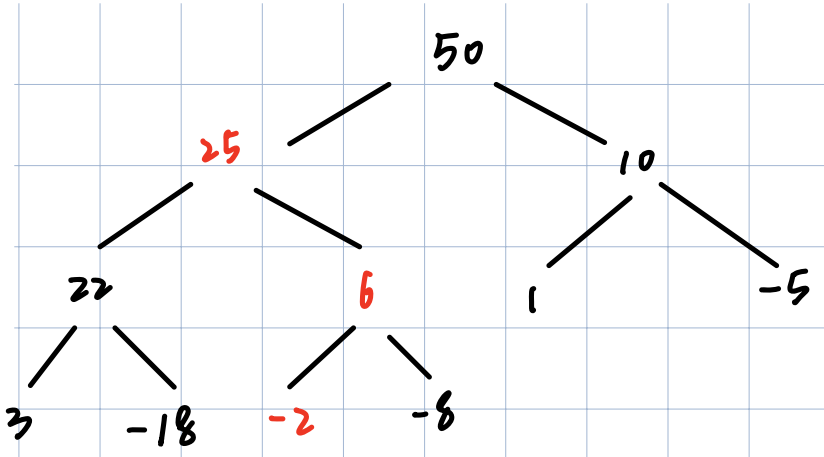
the 4th element is 22.
which is already the largest among 22, 3, -18
no need to switch



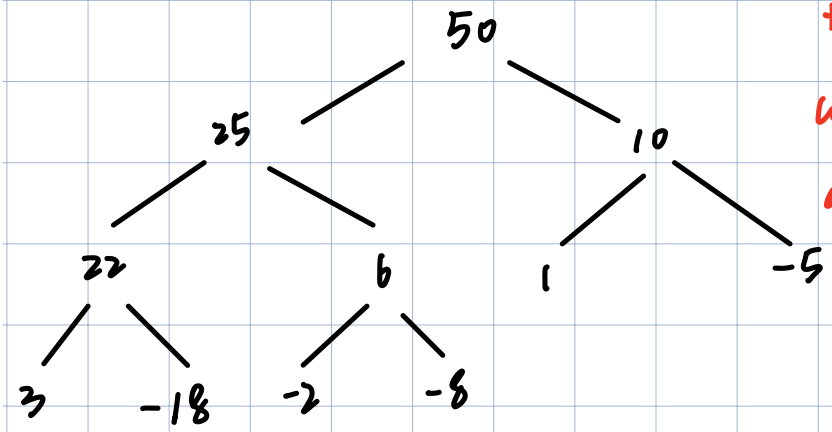
the 3rd element is 10, which is already the largest among 10, 1, -5



the 2nd element is -2.
among -2, 22, 25.
25 is the largest.
so switch 25 and -2.

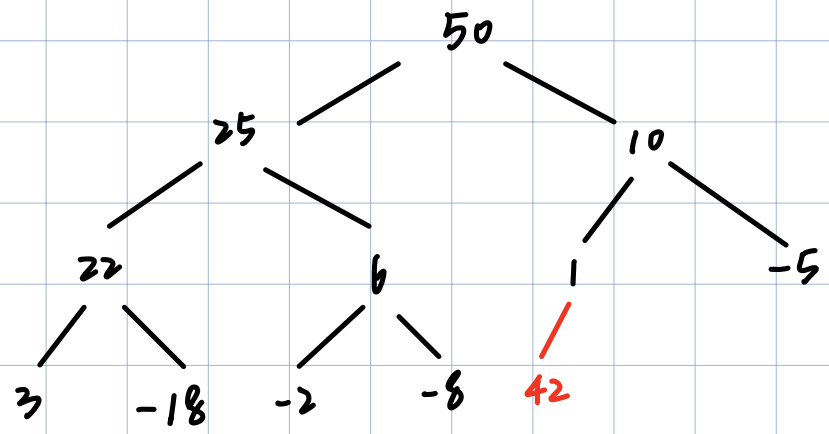


among -2, 6, -8.
6 is the largest.
so switch -2 and 6.

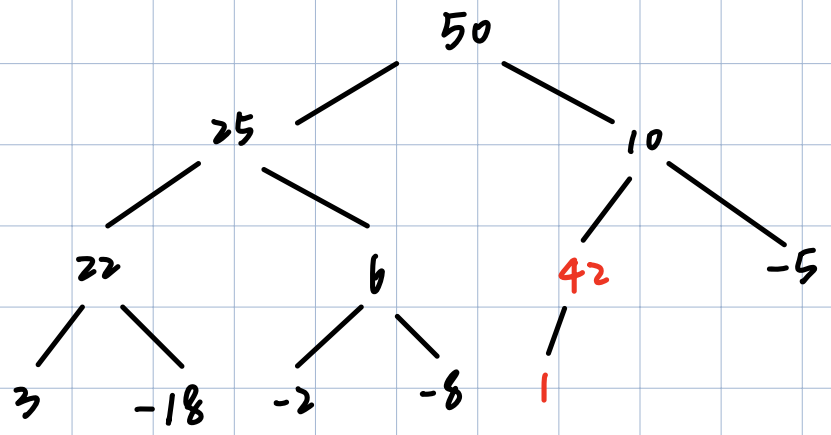


the 1st element is 50.
which is already the largest among 50, 25, 10.
so no need to change.

Insert 42 into Max Heap:

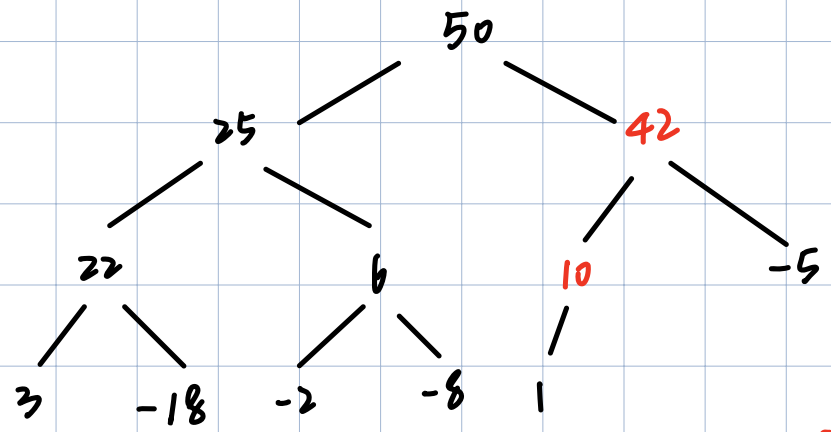


insert 42 at the end of the tree



because 42 > 1

switch 42 and 1



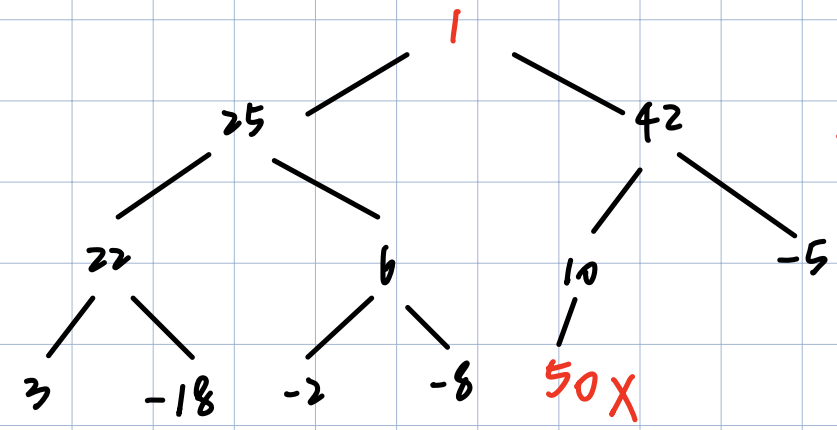
because 42 > 10.

switch 42 and 10.

and 42 < 50

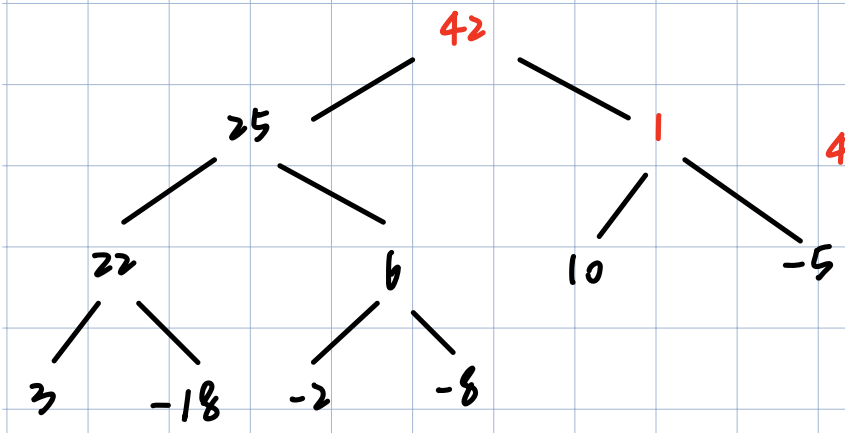
so no switch further

Remove largest element:



Switch largest element with the end.

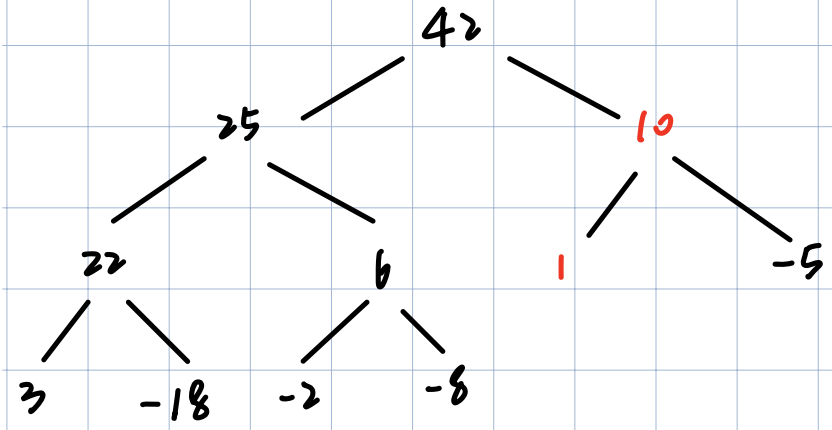
Then remove the largest.



among 1, 25, 42

42 is the largest. so

switch 42 and 1



among 1, 10, -5.

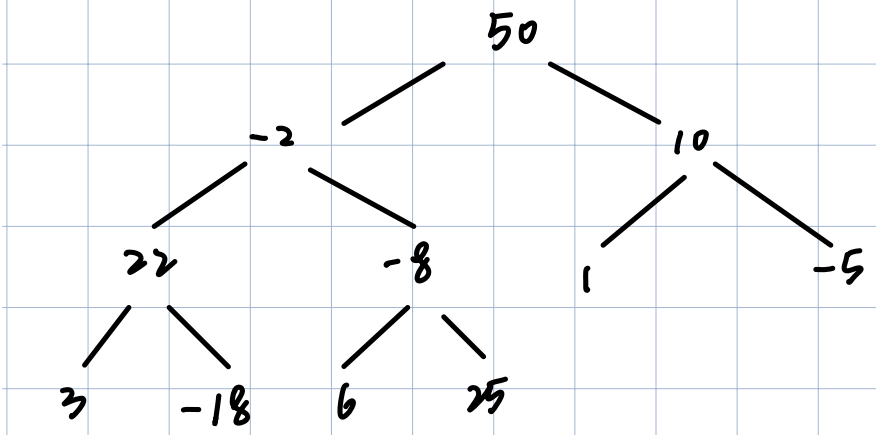
10 is the largest.

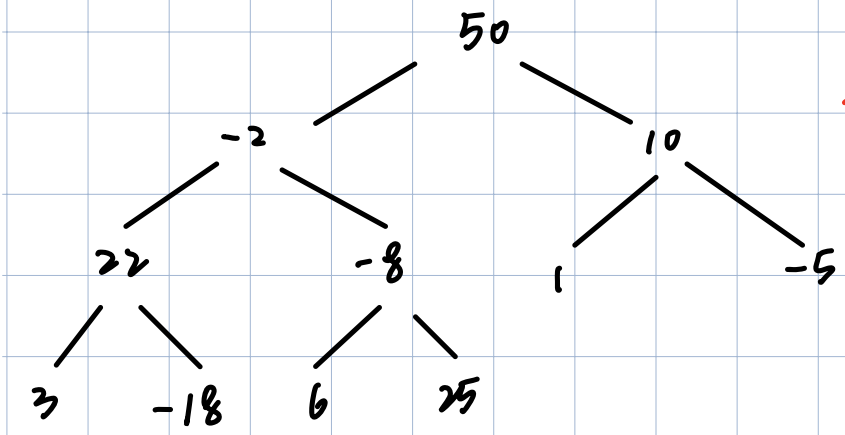
so switch 1 and 10.

Given Array: [50, -2, 10, 22, -8, 1, -5, 3, -18, 6, 25]

Build Min Heap.

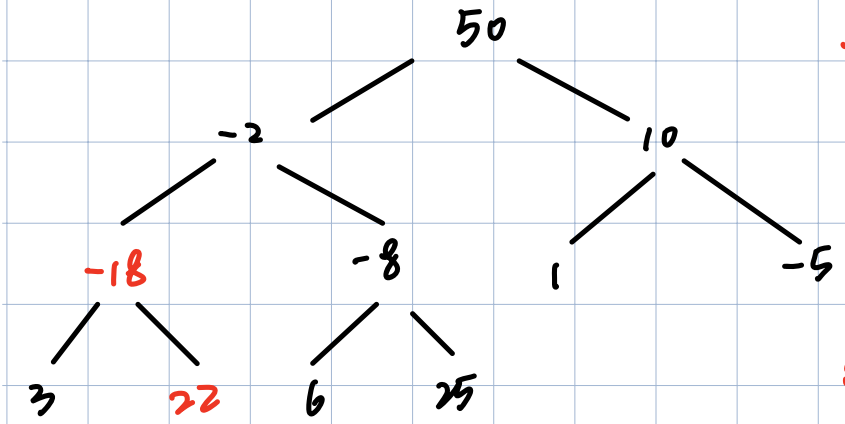
size = 11





the 5th element is -8. which is already the smallest among -8. 6. 25.

so no need to switch

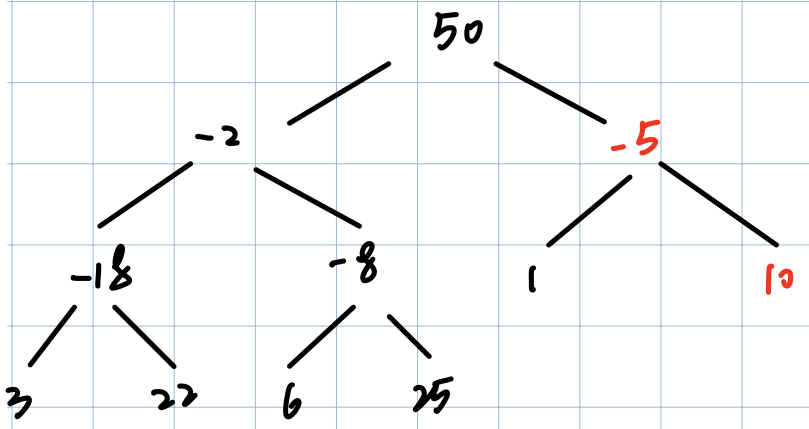


the 4th element is 22.

among 22. 3, -18.

-18 is the smallest.

so switch -18 and 22.

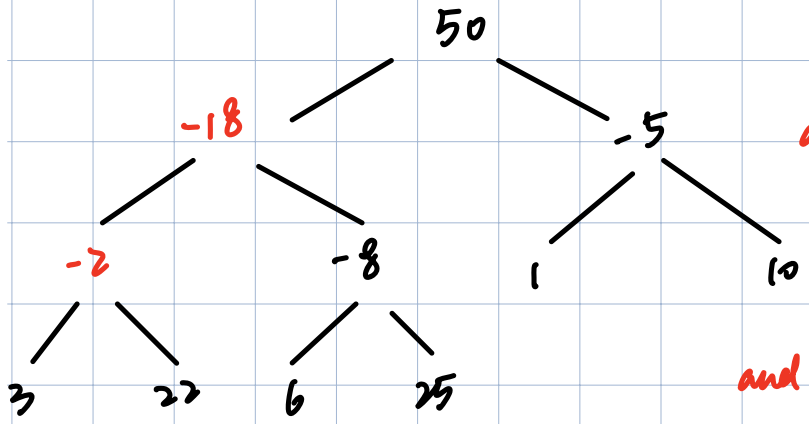


the 3rd element is 10.

among -5, 1, 10.

-5 is the smallest.

so switch -5 and 10.



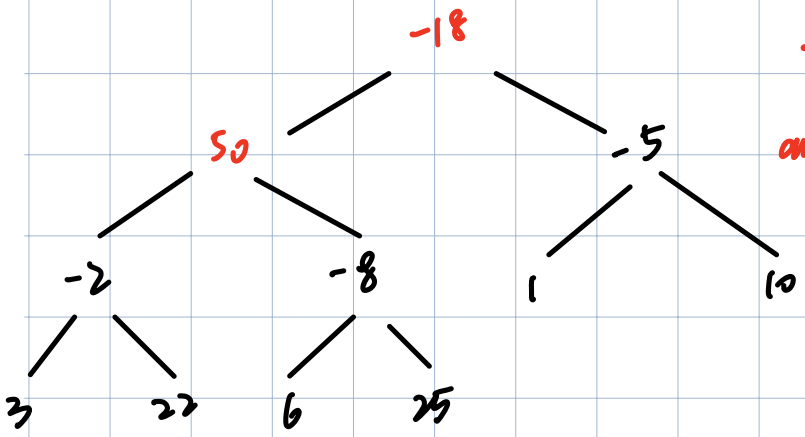
the 2nd element is -2.

among -2, -18, -8.

-18 is the smallest

so switch -18 and -2.

and -2 is the smallest among -2, 3, 22. so no more switch

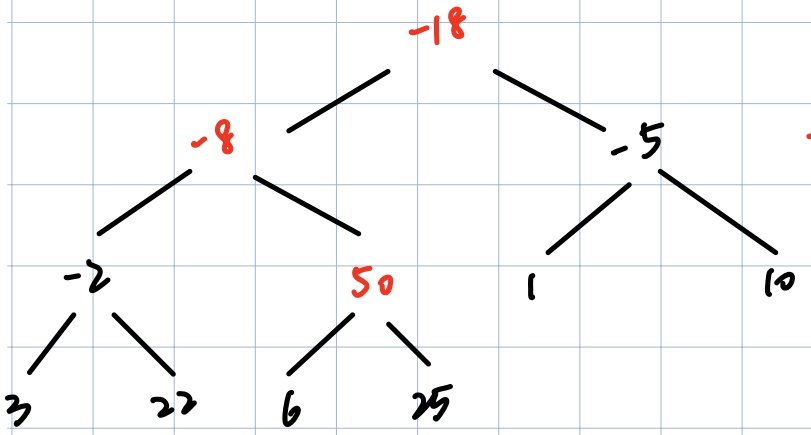


the 1st element is 50

among 50, -18, -5.

-18 is the smallest.

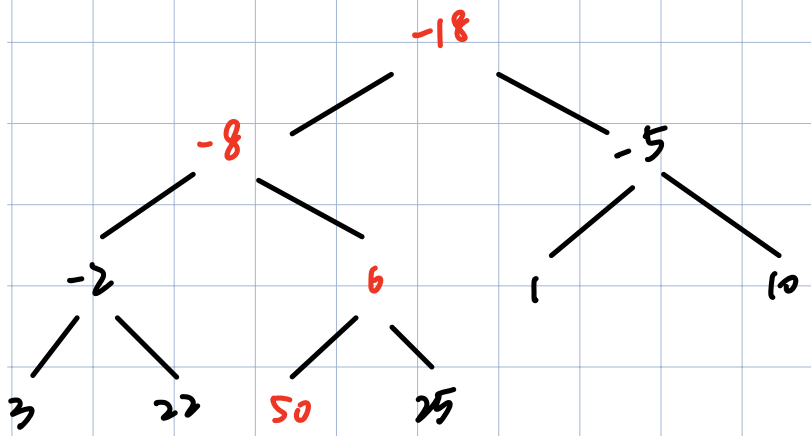
so switch -18 and 50.



among 50, -2, -8

-8 is the smallest.

so switch -8 and 50

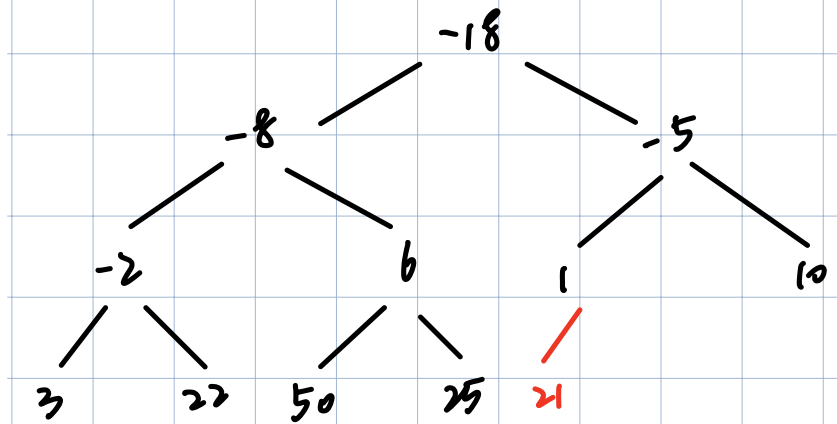


among 50, 6, 25.

6 is the smallest.

so switch 50 and 6.

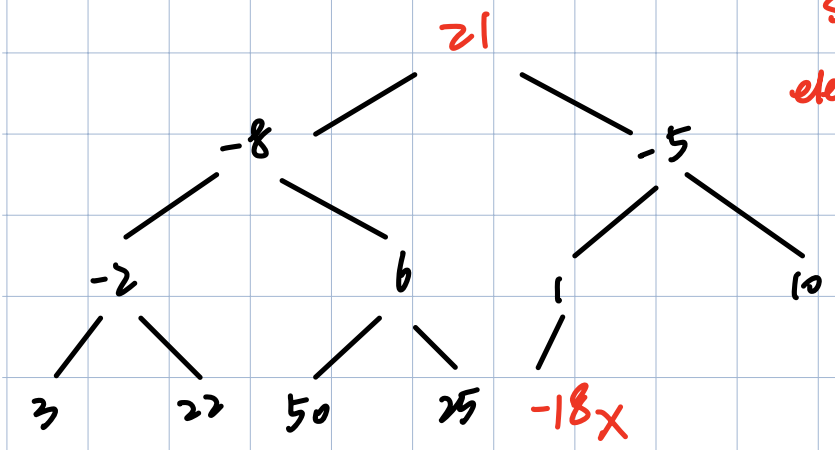
Insert 21 into Min Heap:



insert 21 at the end.

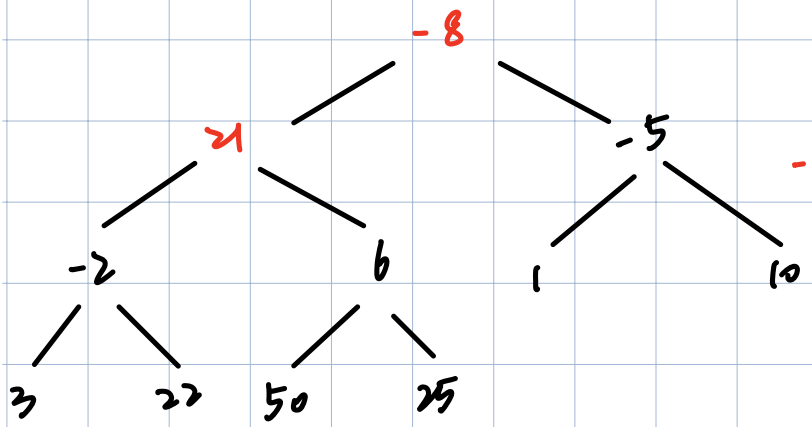
21 > 1 so no changes needed.

Remove the smallest element.



Switch the smallest element and the end.

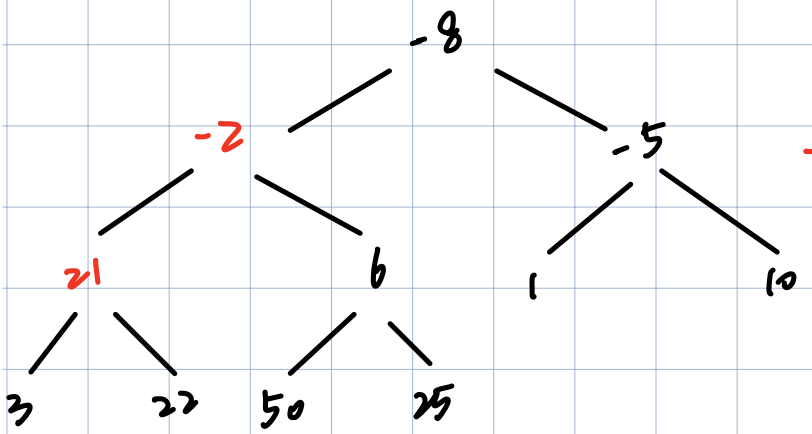
remove the smallest.



among 21, -8, -5

-8 is the smallest.

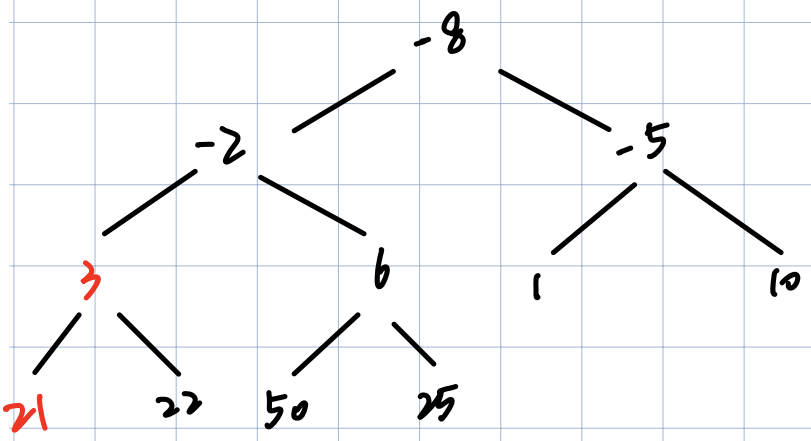
so switch -8 and 21



among 21, -2, 6.

-2 is the smallest.

so switch -2 and 21



among 21, 3, 22.

3 is the smallest

so switch 3 and 21.