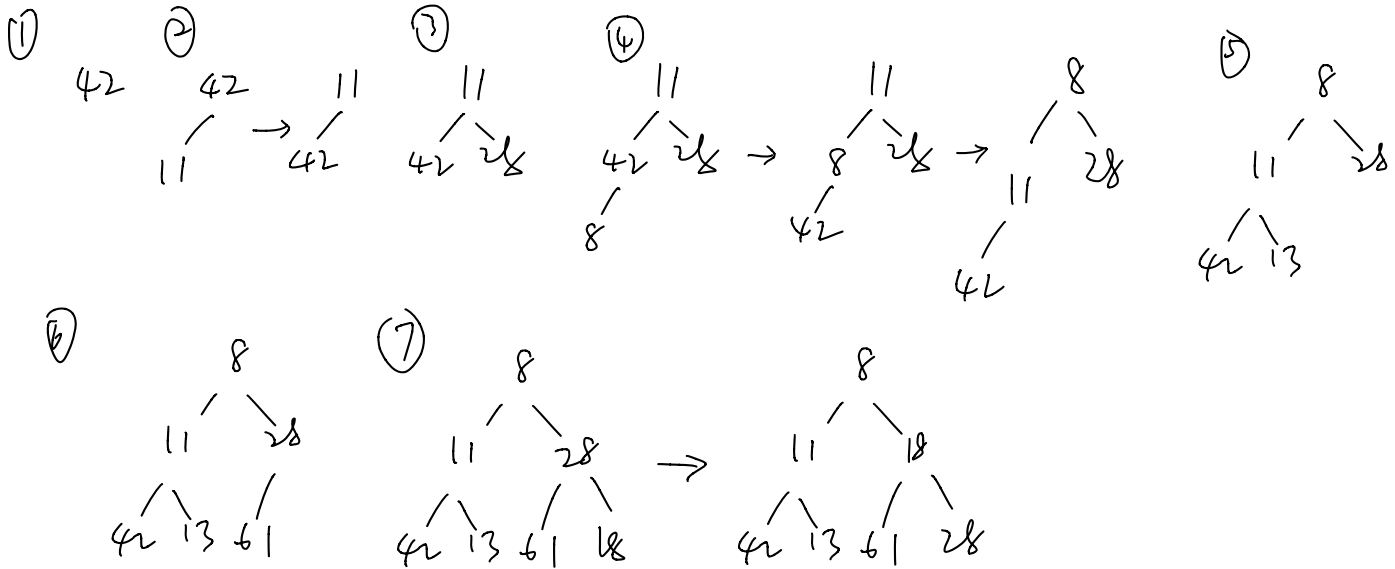


Assignment #6

- 1) Show the result of inserting the following values one at a time into an initially empty binary heap. (Show the heap after each insert). Use trees to illustrate each heap.

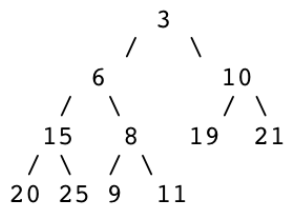
42, 11, 28, 8, 13, 61, 18

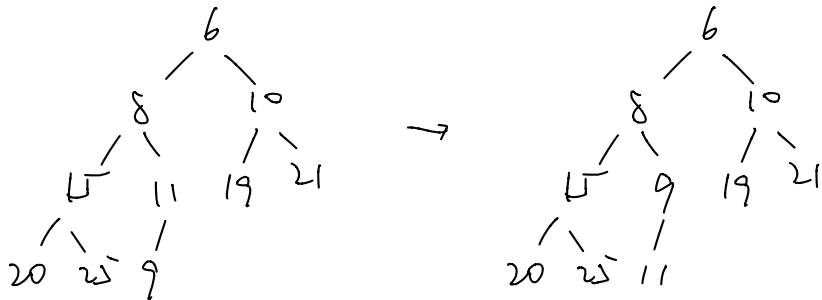
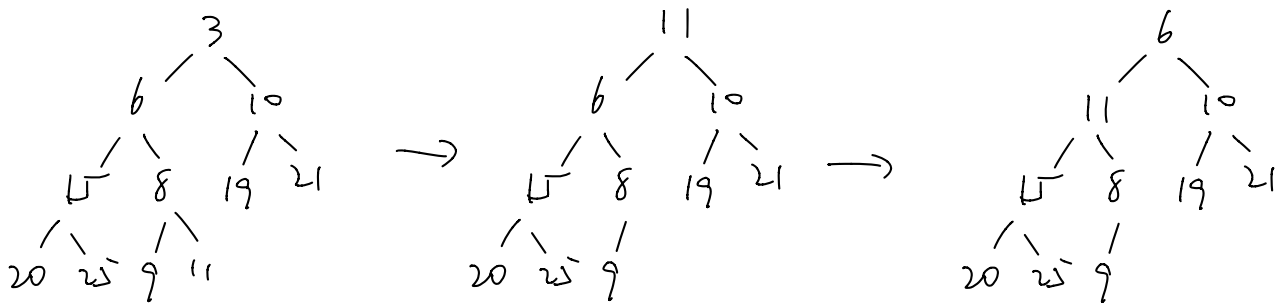


- 2) Show how the final heap created in the previous problem would be stored in an array.

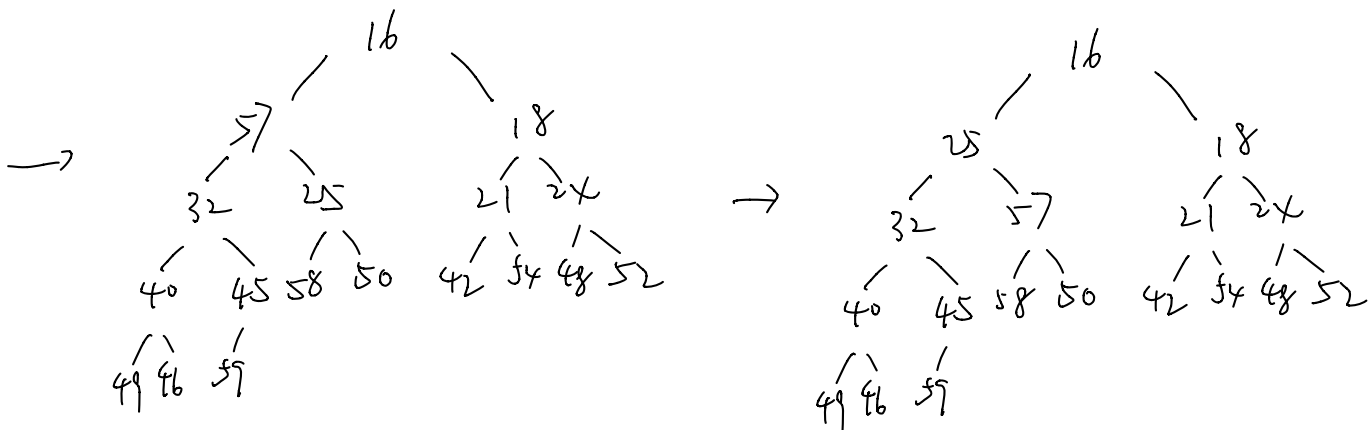
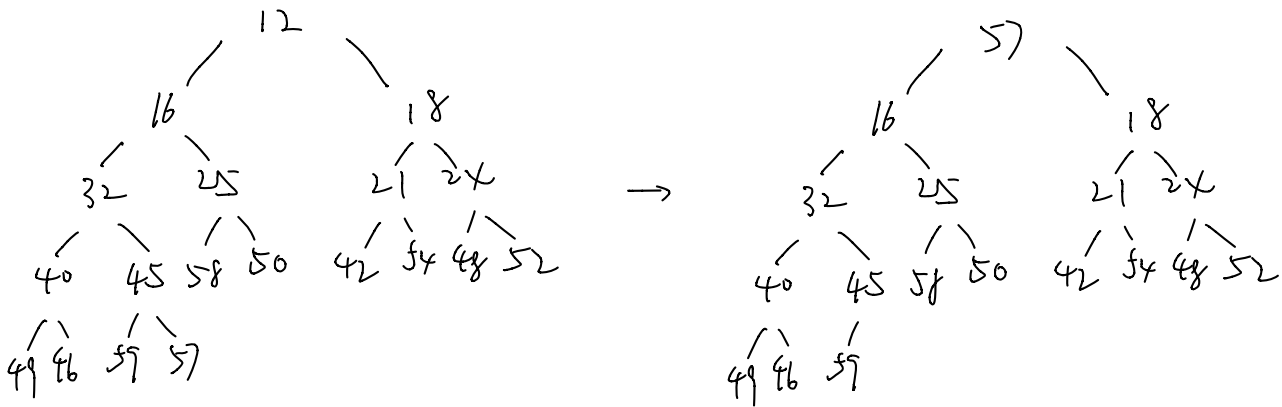
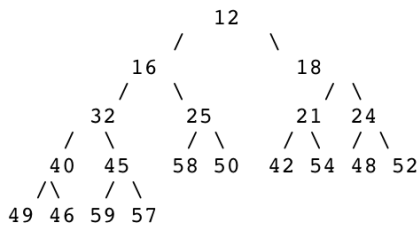
	8	11	18	42	13	61	28		
--	---	----	----	----	----	----	----	--	--

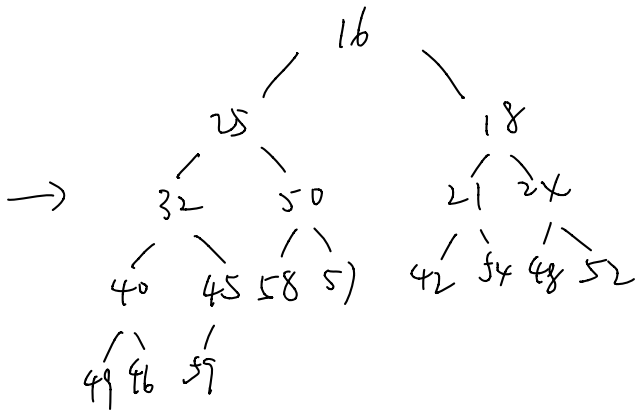
- 3) Show the result after a deleteMin on this binary heap. (Show each step).



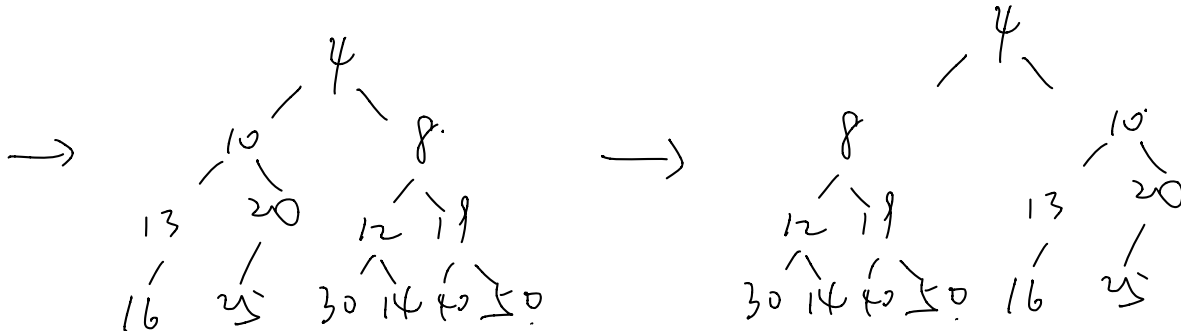
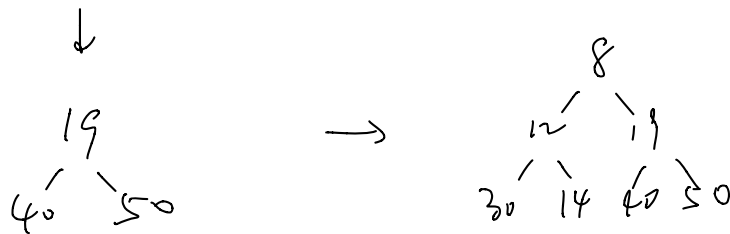
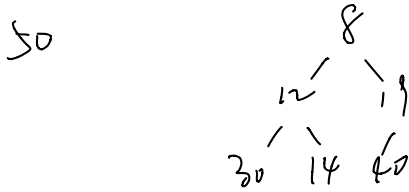
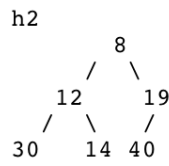
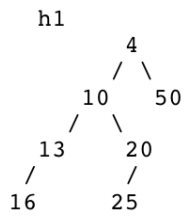


4) Show the result after a deleteMin on this binary heap. (Show each step).

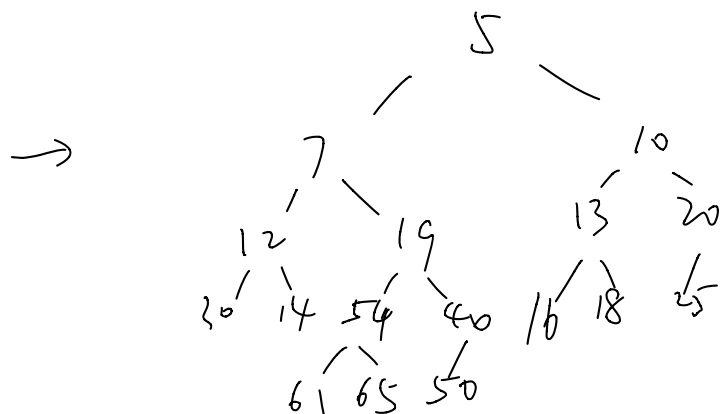
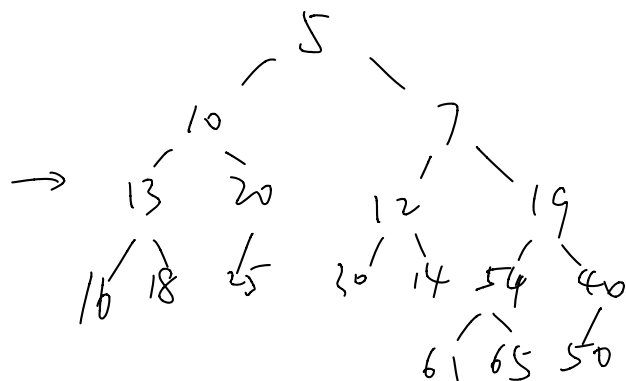
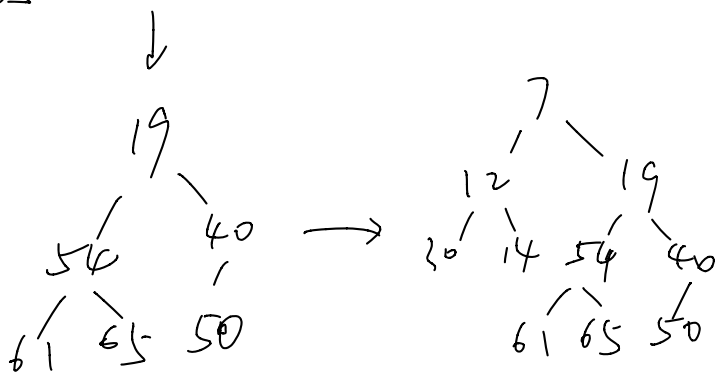
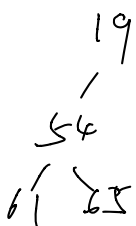
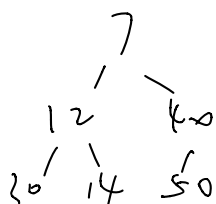
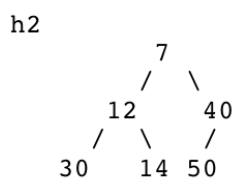
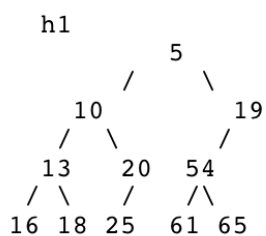




5) Show a recursive merge of the following leftist heaps. (Show each step).

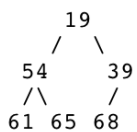


6) Show a recursive merge of the following leftist heaps. (Show each step).

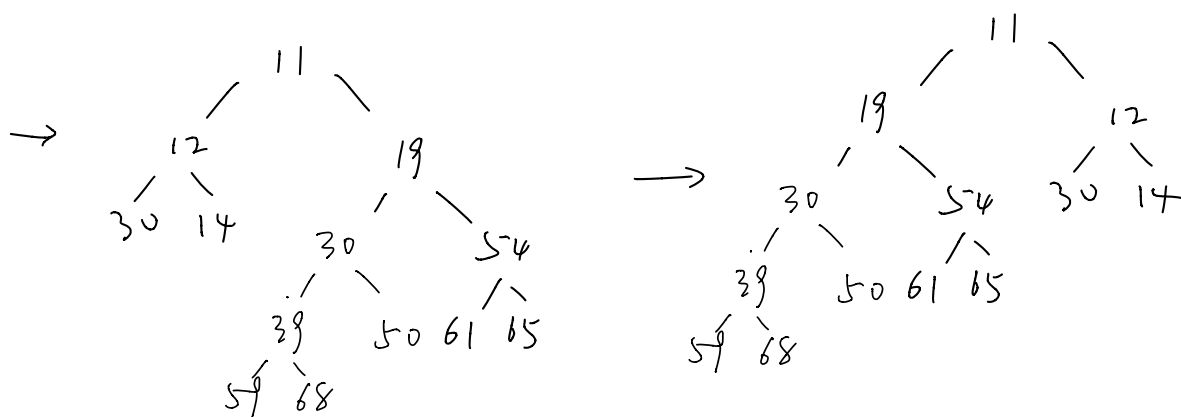
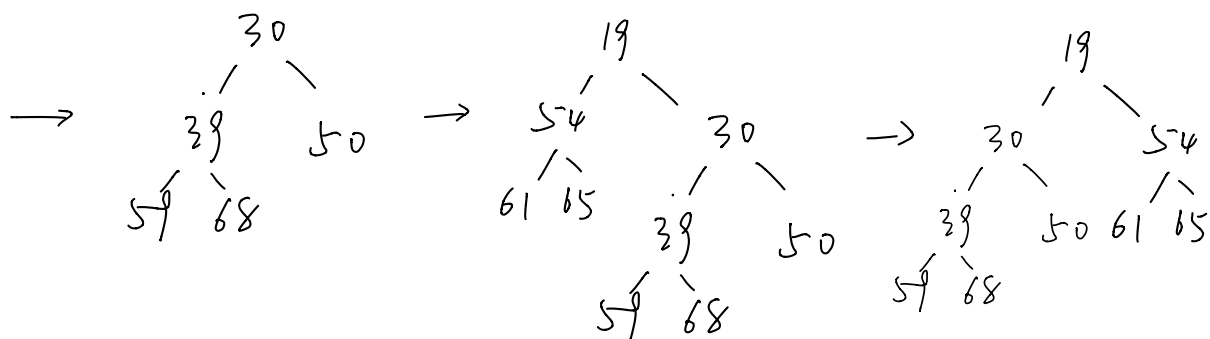
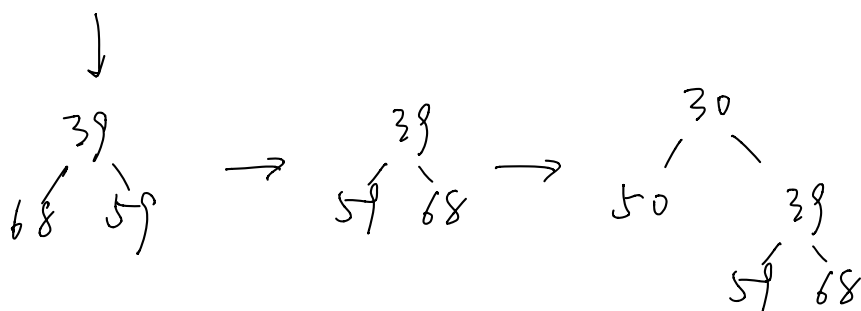
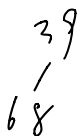
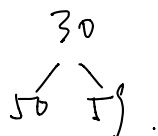
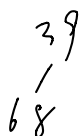
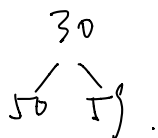
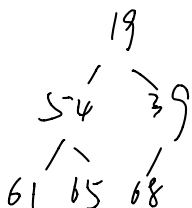
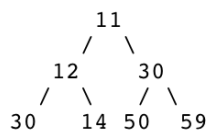


7) Show a recursive merge of the following skew heaps. (Show each step).

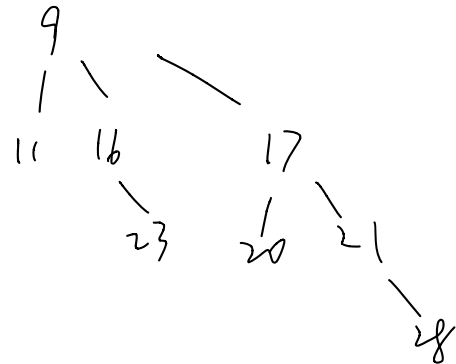
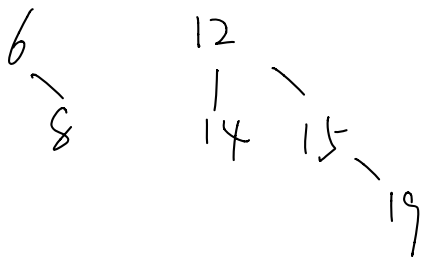
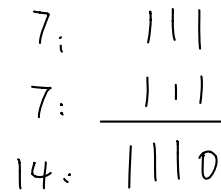
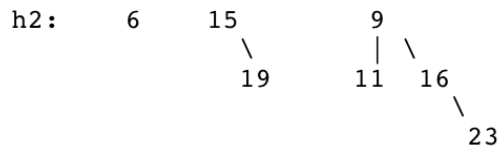
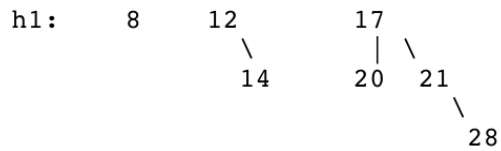
h1



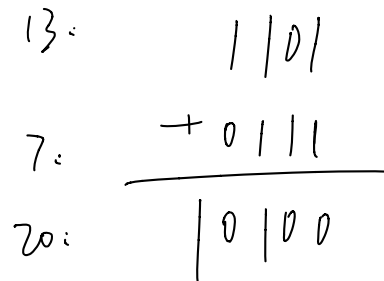
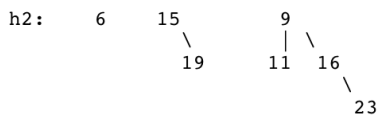
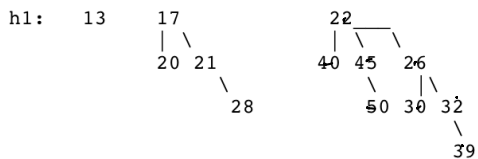
h2



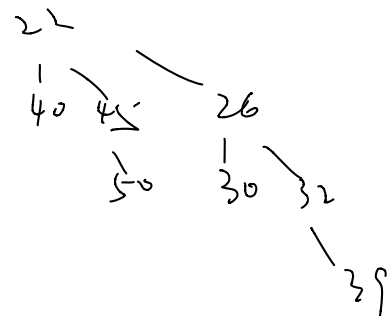
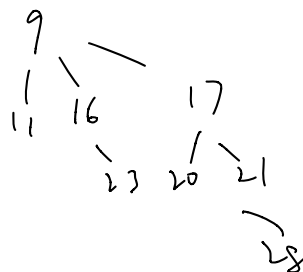
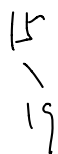
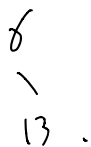
8) Show a merge of the following binomial queues. (Show each step).



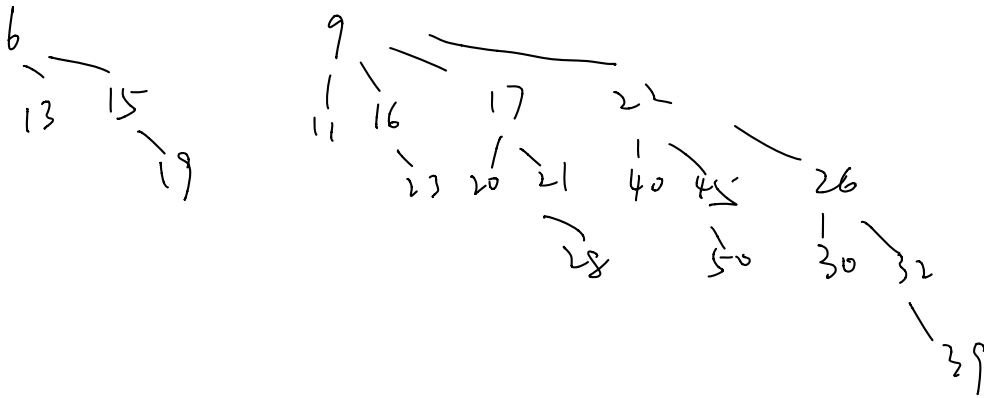
9) Show a merge of the following binomial queues. (Show each step).



①



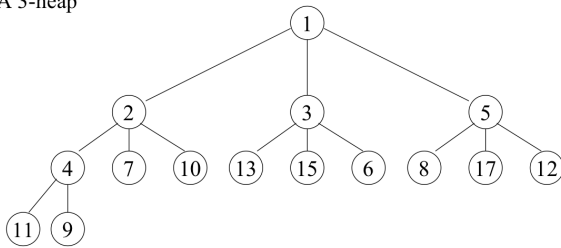
2



10) For the 3-heap shown in slide 37:

- (2 pts) show how it could be stored in an array
- (6 pts) give the formulas to find the left, middle, and right children from any parent
- (2 pts) give the formula to find the parent from any child

A 3-heap



a).

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	2	3	5	4	7	10	13	15	6	8	17	12	11	9	

b). Assume parent index is i .

$$\text{left} = \text{array}[i \times 3 - 1]$$

$$\text{middle} = \text{array}[i \times 3]$$

$$\text{right} = \text{array}[i \times 3 + 1]$$

c). $\text{parentIdx} = (\text{childIdx} + 1) / 3$