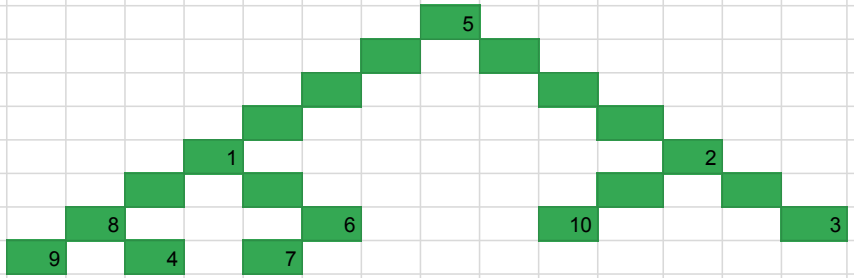
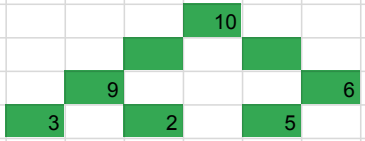
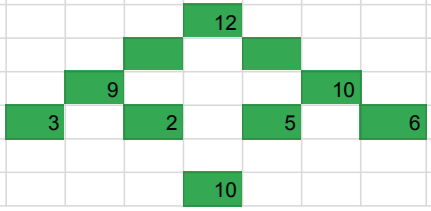
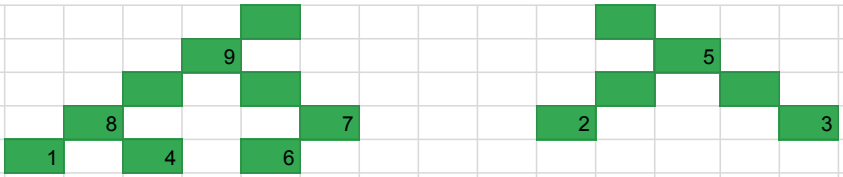
check point		
1	Is the full binary tree in Figure 16-16 of Chapter 16 a heap?	No
	Why?	the left child of the root is a maxheap but not the right child because 30<50
2	What array represents the maxheap shown in Figure 17-1 a?	10, 9, 6, 3, 2, 5
3	What array represents the minheap shown in Figure 17-1 b?	2, 3, 5, 9, 6, 10
4	What criterion can you use to tell whether the node in items[i] is a leaf?	calculate leftIndex = 2*i +1
		and rightInex = 2*i+2
		if leftIndex >= nodeCount or rightIndex >= nodeCount then node is a leaf
5	What complete binary tree does the following array represent?	
	5 1 2 8 6 10 3 9 4 7	
6	Does the array in the previous question represent a heap?	
	NOT a heap, 8>1	
7	Is the full binary tree in Figure 16-16 of Chapter 16 a semiheap?	
	left child is and right child are not heaps therefore it is NOT a semiiheap	
8	Consider the maxheap in Figure 17-1 a. Draw the heap after you insert 12 and	
	then remove 12.	
		
	insert 12	

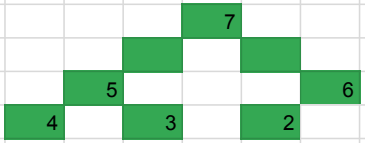
	remove 12										
								9			6
							3		2		5
9	What does the initially empty heap myHeap contain after the following										
	sequence of pseudocode operations?										
	myHeap.add(2)									7	
	myHeap.add(3)								4		
	myHeap.add(4)							1		2	5
	myHeap.add(1)										3
	myHeap.add(9)										
	myHeap.remove()										
	myHeap.add(7)										
	myHeap.add(6)										
	myHeap.remove()										
	myHeap.add(5)										
10	Execute the following pseudocode statements on the array shown in Checkpoint										
	Question 5.										
	for (index = n - 1 down to 0)										
	heapRebuild(index)										

	0	1	2	3	4	5	6	7	8	9
array: original	5	1	2	8	6	10	3	9	4	7
array After heapRebuild(9)	5	1	2	8	6	10	3	9	4	7
array After heapRebuild(8)	5	1	2	8	6	10	3	9	4	7
array After heapRebuild(7)	5	1	2	8	6	10	3	9	4	7
array After heapRebuild(6)	5	1	2	8	6	10	3	9	4	7
array After heapRebuild(5)	5	1	2	8	6	10	3	9	4	7
array After heapRebuild(4)	5	1	2	8	7	10	3	9	4	6
array After heapRebuild(3)	5	1	2	9	7	10	3	8	4	6
array After heapRebuild(2)	5	1	10	9	7	2	3	8	4	6
array After heapRebuild(1)	5	9	10	8	7	2	3	1	4	6
array After heapRebuild(0)	10	9	5	8	7	2	3	1	4	6

	is it true that we must reheapafy all the way down after a swap?										
									10		

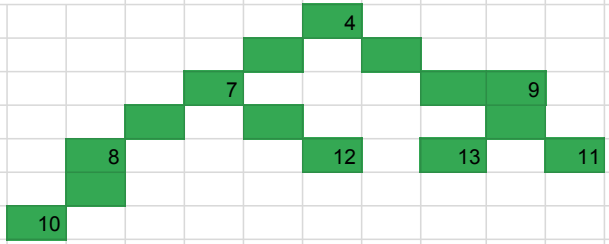


11	Consider a heap-based implementation of the ADT priority queue. What does the underlying heap contain after the following sequence of pseudocode operations, assuming that pQueue is an initially empty priority queue?
	pQueue.add(5)
	pQueue.add(9)
	pQueue.add(6)
	pQueue.add(7)
	pQueue.add(3)
	pQueue.add(4)
	pQueue.remove()
	pQueue.add(9)
	pQueue.add(2)
	pQueue.remove()

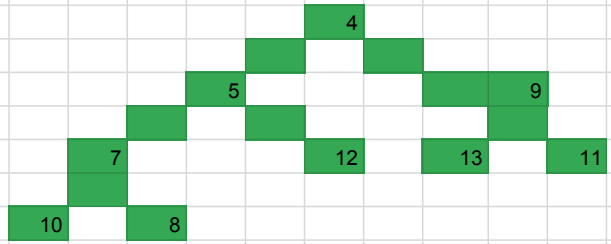


excersises

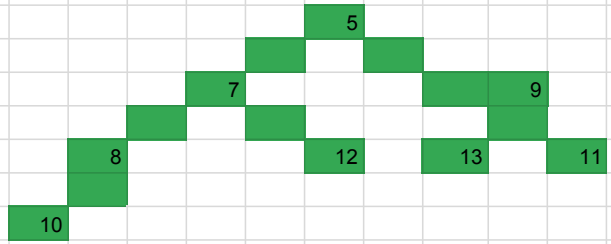
1	Given the minheap myHeap in Figure 17-12 a, show what it would look like after each of the following pseudocode operations:
1a	myHeap.add(8)



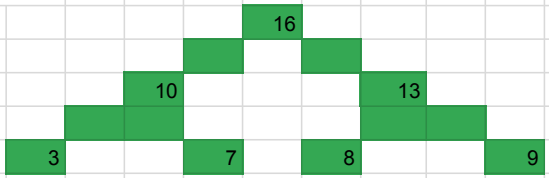
1b	myHeap.add(5)



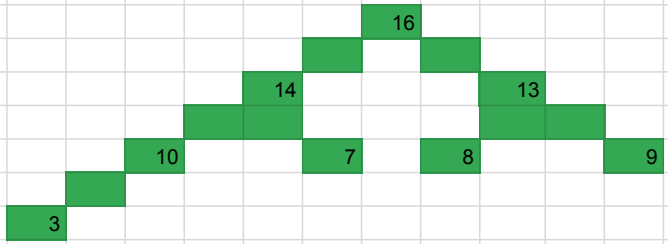
1c	myHeap.remove()



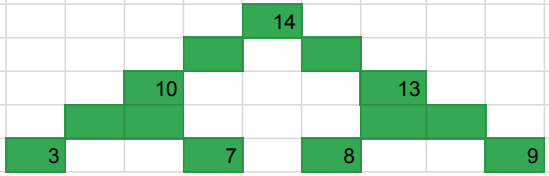
2	Given the maxheap myHeap in Figure 17-12 b, show what it would look like after each of the following pseudocode operations:
2a	myHeap.add(16)



2b	myHeap.add(14)



2c	myHeap.remove()



3	Repeat Checkpoint Question 10, but instead use the array 9, 12, 4, 8, 3, 11, 6, 15.																
	array: original	9	12	4	8	3	11	6	5								
	array After heapRebuild(7)	9	12	4	8	3	11	6	5								
	array After heapRebuild(6)	9	12	4	8	3	11	6	5								
	array After heapRebuild(5)	9	12	4	8	3	11	6	5								
	array After heapRebuild(4)	9	12	4	8	3	11	6	5								
	array After heapRebuild(3)	9	12	4	8	3	11	6	5								
	array After heapRebuild(2)	9	12	11	8	3	4	6	5								
	array After heapRebuild(1)	9	12	11	8	3	4	6	5								
	array After heapRebuild(0)	9	12	11	8	3	4	6	5		12						
		12	9	11	8	3	4	6	5								
									9				11				
							8			3		4			6		
					5												