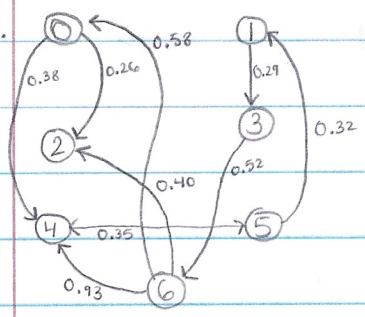
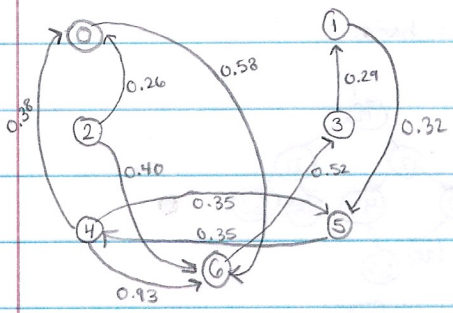
Review Exercise 4

1.



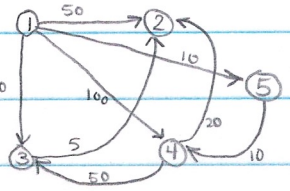
From:	1	2	3	4	5	6
0	∞	0.26 0	∞	0.38 0	∞	∞
2	∞	0.26 0	∞	0.88 0	∞	∞
4	∞	0.26 0	∞	0.38 0	0.73 4	∞
5	1.05 5	0.26 0	∞	0.38 0	0.73 4	∞
1	1.05 5	0.26 0	1.34 1	0.38 0	0.73 4	∞
3	1.05 5	0.26 0	1.34 1	0.38 0	0.73 4	1.86 3

Reverse Order



From	0	1	2	3	4	5	6
2	0.26 2	∞	∞	∞	∞	∞	0.40 2
0	0.26 2	∞	∞	∞	∞	∞	0.40 2
6	0.26 2	∞	∞	0.92 6	∞	∞	0.40 2
3	0.26 2	1.21 3	∞	0.92 6	∞	∞	0.40 2
1	0.26 2	1.21 3	∞	0.92 6	∞	1.53 1	0.40 2
5	0.26 2	1.21 3	∞	0.92 6	1.88 5	1.53 1	0.40 2

2.

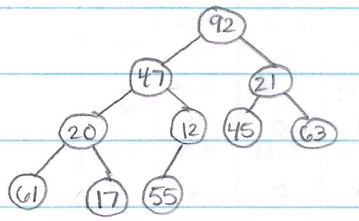


From:	1	2	3	4	5
1	∞	50 1	30 1	100 1	(10 1)
5	∞	50 1	30 1	(20 5)	10 1
4	∞	40 4	(30 1)	20 5	10 1
2	∞	(35 3)	(30 1)	(20 5)	(10 1)

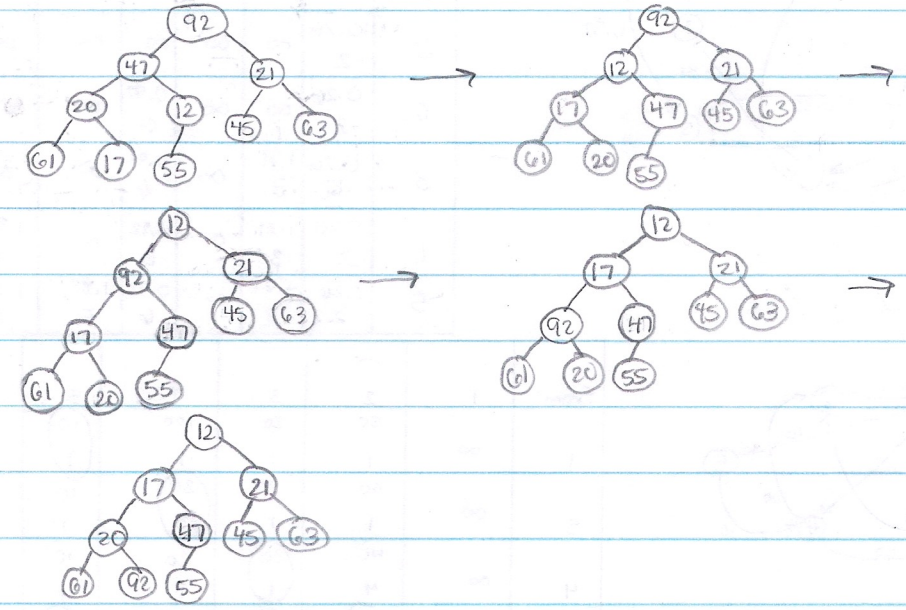
3. Structure-Property and Heap Order Property

4.

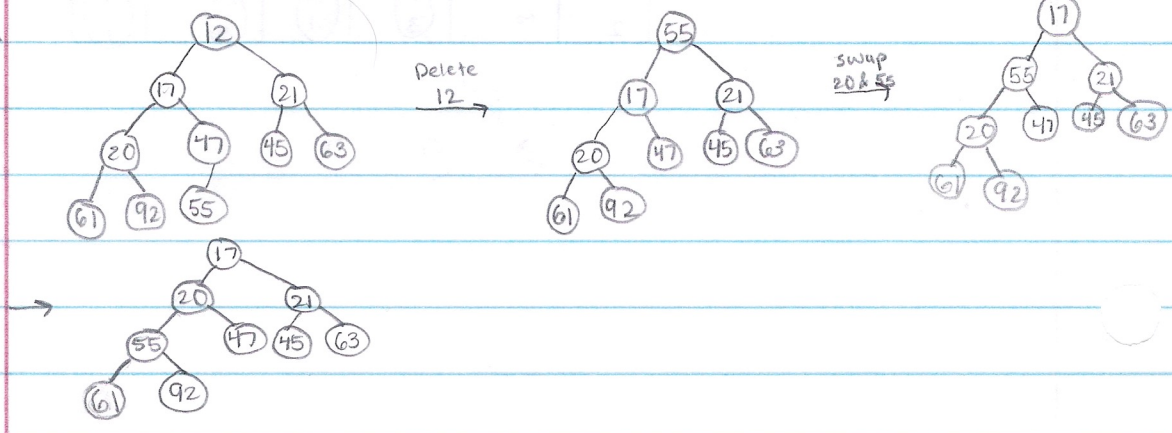
	92	47	21	20	12	45	63	61	17	55
0	1	2	3	4	5	6	7	8	9	10



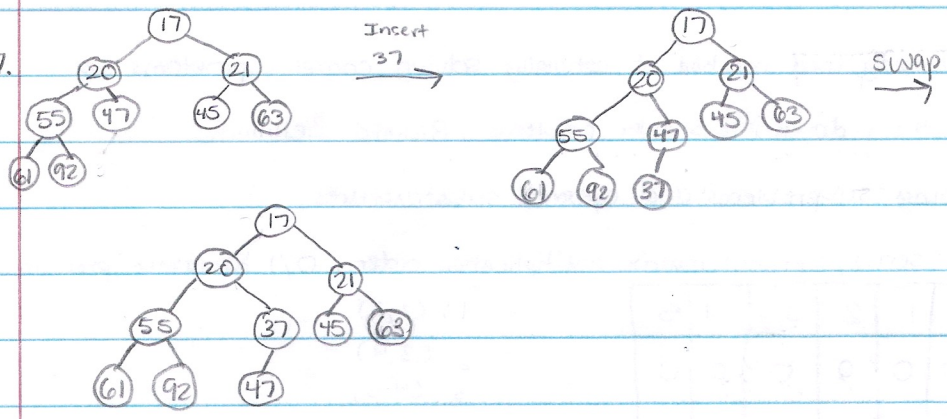
5. No, the resulting tree in problem 4 is not a heap.



6.

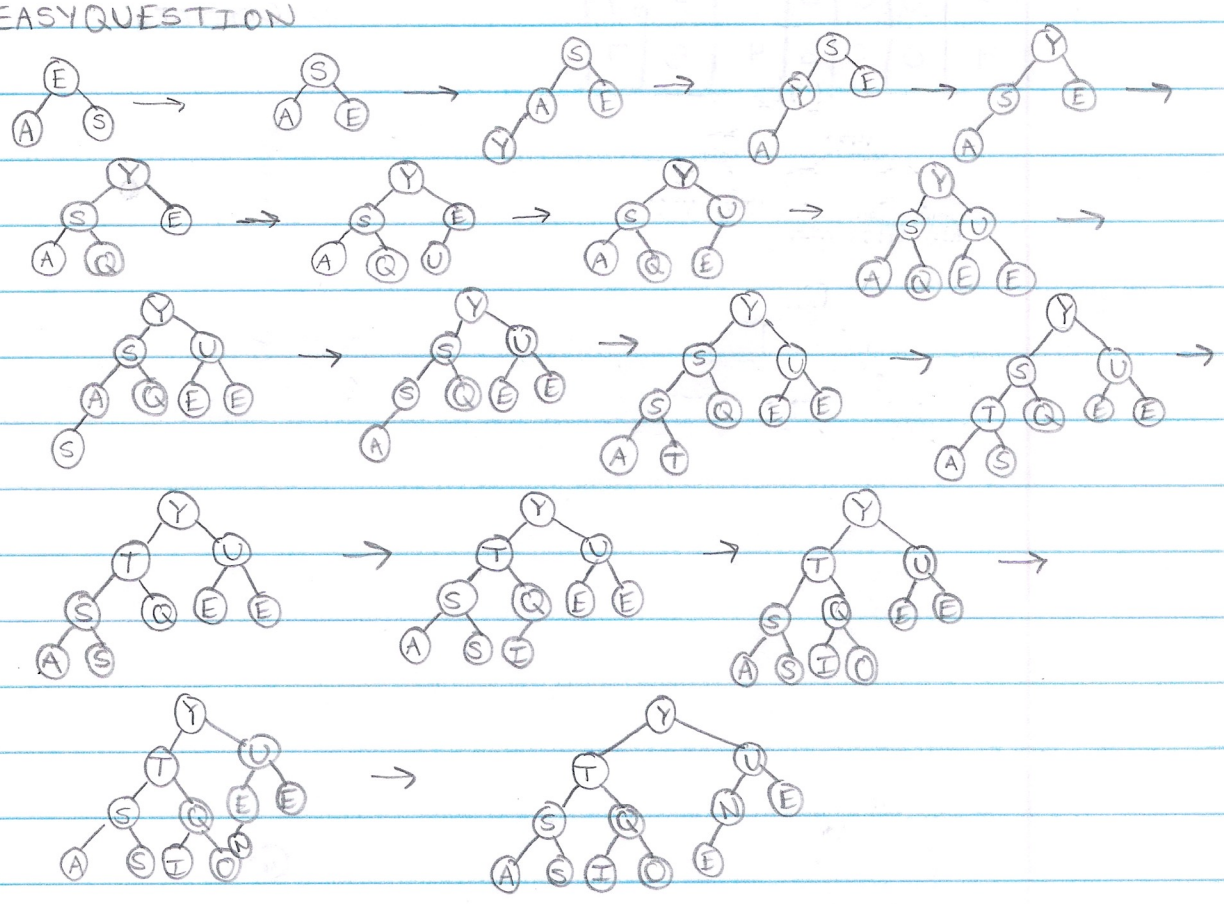


7.



8. Yes, an array in decreasing order is considered a max-oriented heap.

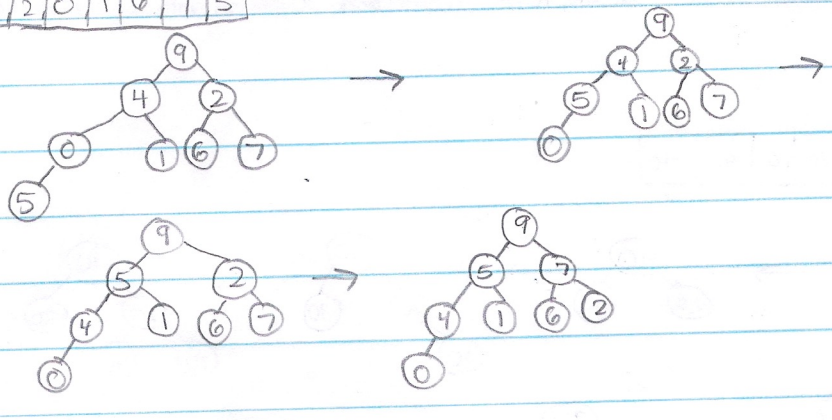
9. EASYQUESTION



Heapsort Exercise

10.

9	4	2	0	1	6	7	5



① | 9 | 5 | 7 | 4 | 1 | 6 | 2 | 0 |

0	5	7	4	1	6	2	9

② | 7 | 5 | 6 | 4 | 1 | 0 | 2 | 9 |

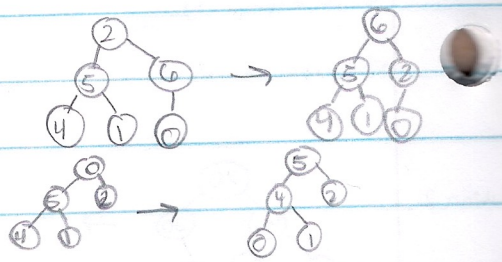
2	5	6	4	1	0	7	9

③ | 6 | 5 | 2 | 4 | 1 | 0 | 7 | 9 |

0	5	2	4	1	6	7	9

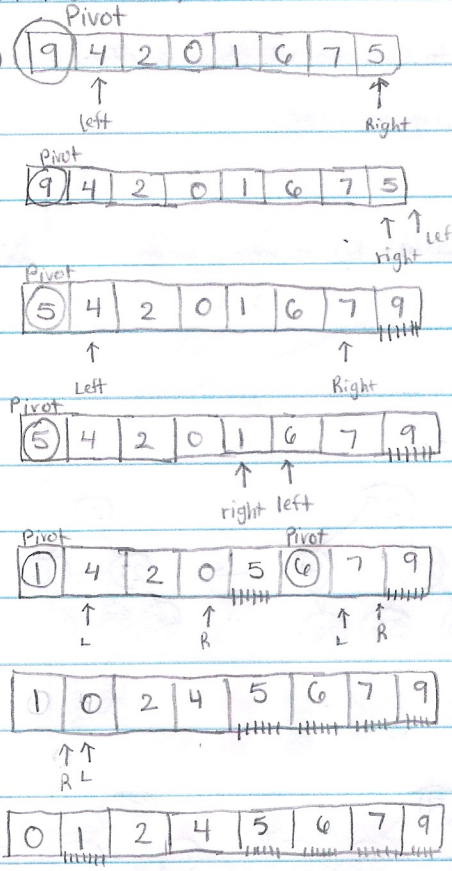
④ | 5 | 4 | 2 | 0 | 1 | 6 | 7 | 9 |

1	4	2	0	5	6	7	9



Quicksort

10. b)



11. DP is commonly used method of optimally solving complex problems by breaking them down into simpler problems ; Richard Bellman.

12. Overlapping subproblems and optimal substructures

13. Fibonacci series, optimal matrix multiplication order, 0/1 knapsack problem

14.

I \ W	0	1	2	3	4	5
0	0	0	0	0	0	0
1	0	0	3	3	3	3
2	0	0	3	4	4	7
3	0	0	3	4	5	7
4	0	0	3	4	5	7

1: (2,3)
2: (3,4)
3: (4,5)
4: (5,6)