

# EC330 HW5 Solution

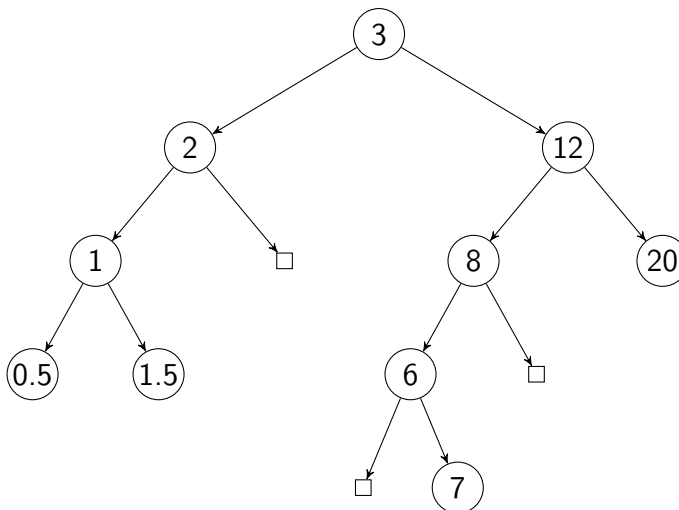
Emre Ateş

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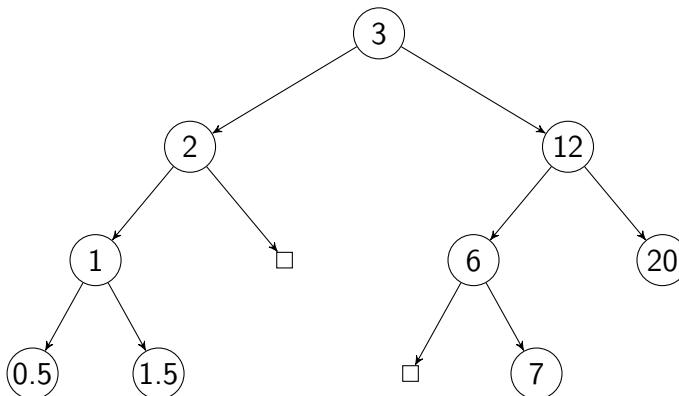
1. The selection algorithm is in-place, since it doesn't generate any extra arrays, or other data structures. However, it is a recursive algorithm. This would require extra space on the stack for each function call.

A truly in-place implementation of the selection algorithm would be implemented in a non-recursive way i.e., it would find the medians within a while loop.

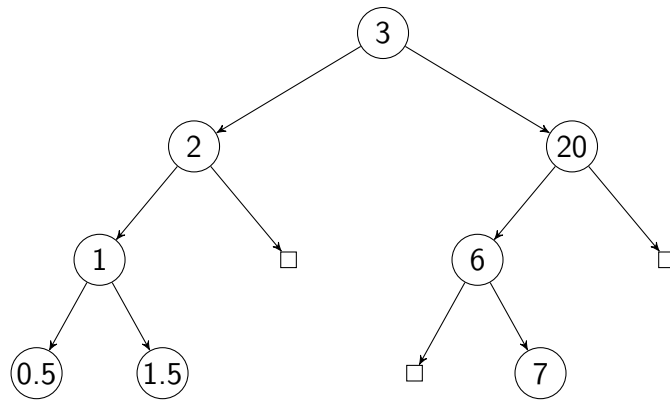
2. (a) We will insert 3, 12, 2, 8, 1, 1.5, 6, 0.5, 7 and 20:



- (b) After deleting 8, we just swap 8 with 6:



- (c) If we delete 12 as well, we swap 12 with its successor, 20:



3. The columns are the options of the question:

index	a.	b.	c.	d.	e. (1)	e. (2)
0		9679	9679			
1	4371	4371	4371	4371	4371	4199
2		1989				9679
3	6174 → 1323	1323	1323	1323	6173	
4	4344	6173	6173	6173	4344	
5		4344	4344	9679		
6						
7				4344		1323
8			1989			
9	1989 → 9679 → 4199	4199	4199	4199	1989	

For d, 1989 cannot be placed in the hash table without expanding it.

Note that the two columns for e are the two different hash tables required for cuckoo hashing.