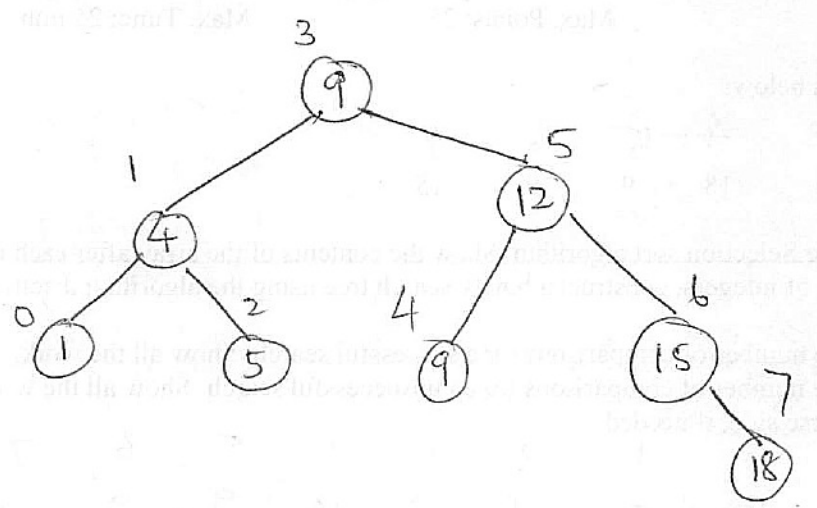


(b)

0	1	2	3	4	5	6	7
1	4	5	9	9	12	15	18



(c) # Comparisons for a successful search.

Keys	9	4	12	1	5	9	15	18
# Comparisons	1	2	2	3	3	3	3	4

$$\text{Avg} = (1 + 2 + 2 + 3 + 3 + 3 + 3 + 4) / 8 = 21 / 8 = 2.625$$

(d) unsuccessful search

< 1	3	No comparison needed for $\left. \begin{array}{l} > 4 \< 5 \\ > 9 \< 9 \end{array} \right\} \text{no integers in these ranges.}$
> 4 < 4	3	
> 4 &lt; 4		
> 5 < 9	3	
> 4 &lt; 9		
> 9 < 12	3	
> 12 < 15	3	
> 15 < 18	4	
> 18	4	
<u>Total</u>	<u>23/7 = 3.285</u>	

Student Name: _____

J#: _____

CSC 228 Data Structures and Algorithms, Fall 2017

Instructor: Dr. Natarajan Meghanathan

Quiz 6 (Oct. 30, 2017)

Max. Points: 25

Max. Time: 25 min.

Given an array of integers below:

0	1	2	3	4	5	6	7
12	5	1	4	18	9	9	15

- (a) Sort the array using the Selection sort algorithm. Show the contents of the array after each iteration.
 - (b) Using the sorted array of integers, construct a binary search tree using the algorithm discussed in class.
 - (c) Determine the average number of comparisons for a successful search. Show all the work. ³
 - (d) Determine the average number of comparisons for an unsuccessful search. Show all the work. ⁶
- Use the space on the reverse side, if needed.

	0	1	2	3	4	5	6	7
<u>Initialization</u>	12	5	1	4	18	9	9	15
<u>Iteration 0</u>	1	5	12	4	18	9	9	15
<u>Iteration 1</u>	1	4	12	5	18	9	9	15
<u>Iteration 2</u>	1	4	5	12	18	9	9	15
<u>Iteration 3</u>	1	4	5	9	18	12	9	15
<u>Iteration 4</u>	1	4	5	9	9	12	18	15
<u>Iteration 5</u>	1	4	5	9	9	12	18	15
<u>Iteration 6</u>	1	4	5	9	9	12	15	18
<u>Final sorted array</u>	0	1	2	3	4	5	6	7
	1	4	5	9	9	12	15	18