Royal University of Bhutan
Gyalpozhing College of Information Technology
ITS202: Algorithms and Data Structure
Class Test - II : 20 Marks
Date: 11-December-2020

1. The following questions refer to the tree of Figure 1. **[0.5 * 8 = 4]**

   (a) Which node is the root?
   (b) What are the internal nodes?
   (c) How many descendants does node cs016/ have ?
   (d) How many ancestors does node cs016/ have ?
   (e) What are the siblings of node homeworks/ ?
   (f) Which nodes are in the subtree rooted at node projects/?
   (g) What is the depth of node papers/?
   (h) What is the height of the tree?

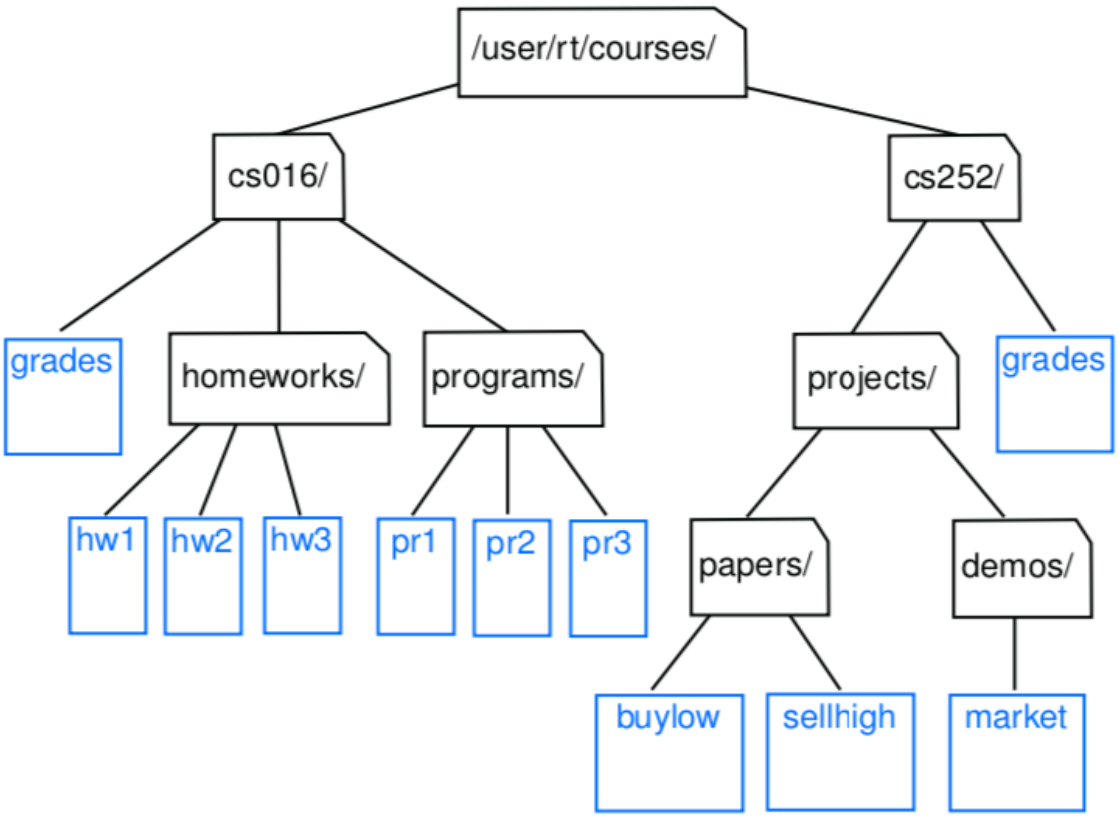

Figure 1

2. Give the sequences of nodes examined when the methods in BST are used to compute each of the following quantities for the tree drawn in figure 2.
[0.5 * 6 = 3]

(a) floor("Q")
(b) select(5) E
(c) ceiling("Q")
(d) rank("J")
(e) size("D", "T")
(f) keys("D", "T")

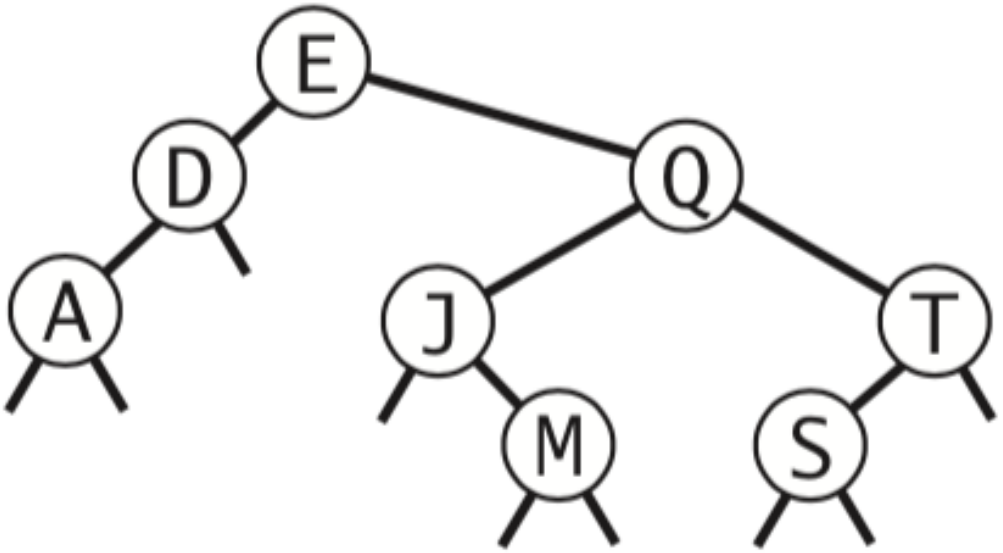

Figure 2

3. Explain four types of rotation in AVL Tree. **[1* 4 = 4]**

4. Apply Dijktras Algorithm in the graph given below. **[1* 9 = 9]**

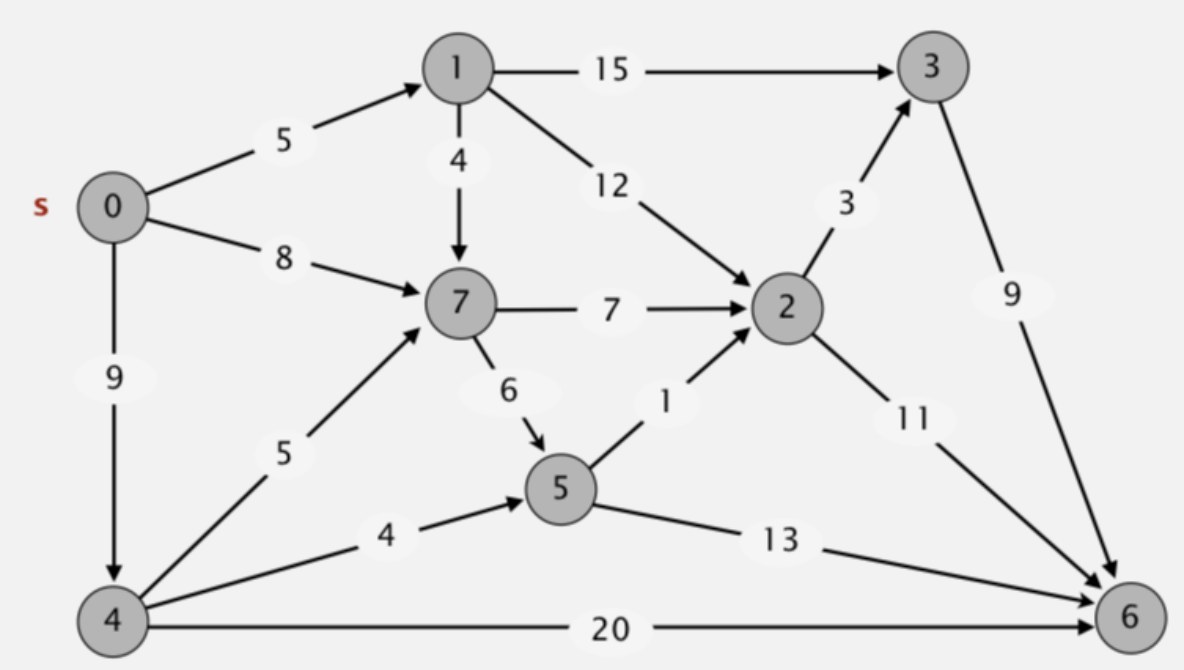

Figure 3

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