

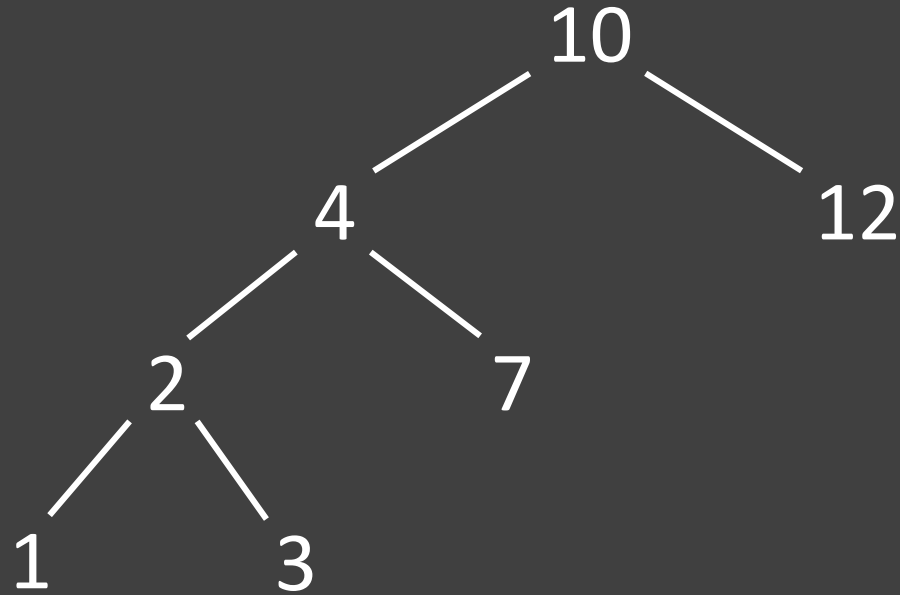
COMP2521 Revision Trivia 2

Question

- a) What is the best case time complexity for inserting N elements into an AVL tree?
- b) What is the worst case time complexity?

Question

Show the result of a right rotation at the node with a 4 in the following BST

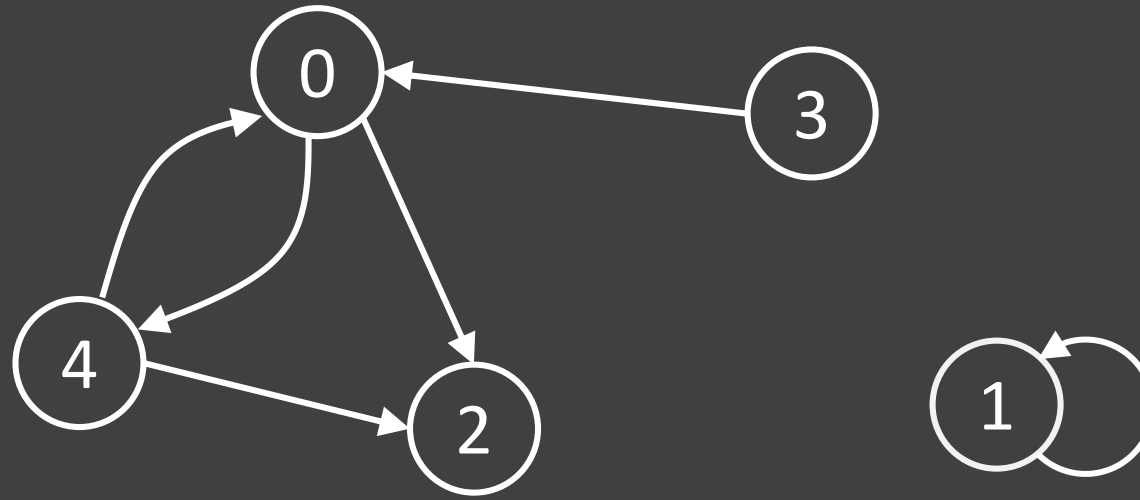


Question

Suppose you are given two sorting programs. You are told that one of them is quick sort (with random pivot) and the other is merge sort, but you are not told which one is which. Describe a test you could run to distinguish them.

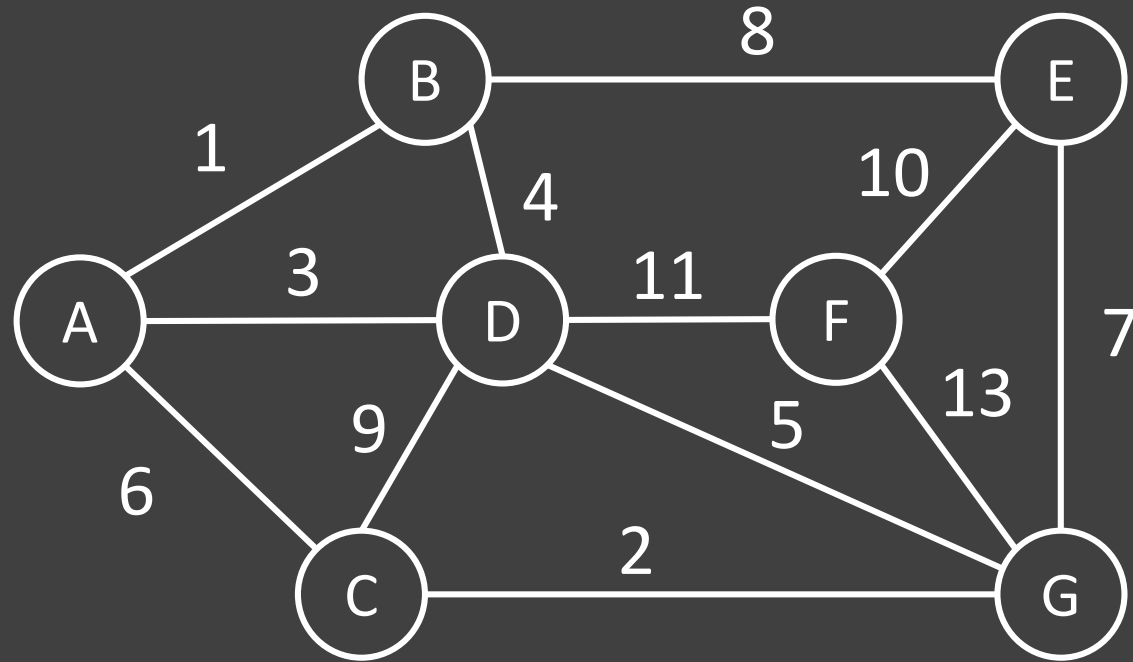
Question

Draw the adjacency list representation for this graph. (Assume the lists are kept in order.)



Question

Apply Prim's algorithm to this graph starting at vertex C and show the order that the edges are added to the MST. What is the total cost of the MST?



Consider the following sequence of numbers:

5 4 6

Draw a BST such that preorder traversal of the BST would give this sequence.

Repeat for postorder traversal and level order traversal.

Question

You have asked your friends Alice and Bob to implement a hash table that uses double hashing.

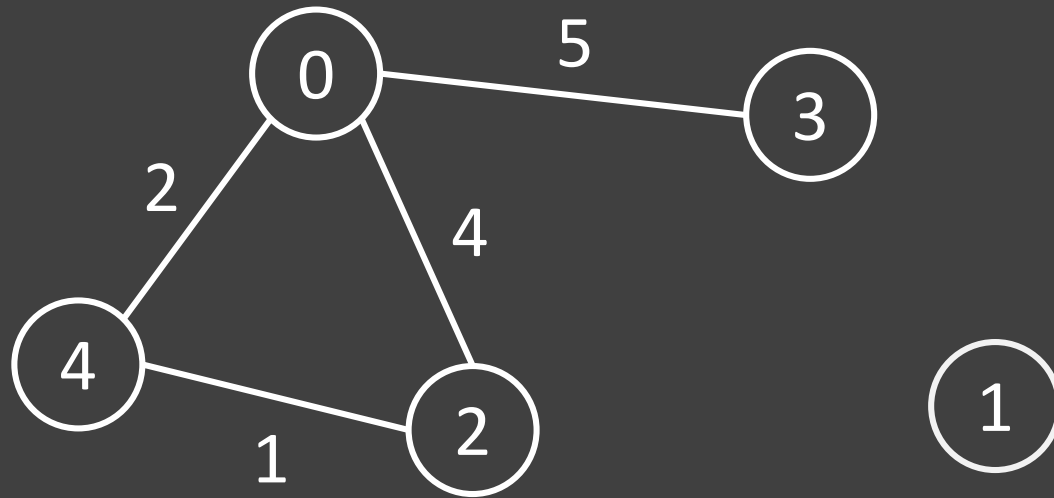
Alice implements a hash table of size $N = 11$ that uses a primary hash function of $h_1(x) = x \% 11$ and a secondary hash function of $h_2(x) = x \% 5$.

Bob implements a hash table of size $N = 10$ that uses a primary hash function of $h_1(x) = x \% 10$ and a secondary hash function of $h_2(x) = 7 - (x \% 7)$.

Whose implementation is flawed? Explain why.

Question

Draw the adjacency list representation for this graph. (Assume the lists are kept in order.)



Question

State two drawbacks of non-comparison-based sorting algorithms.

Give an example of a non-comparison-based sorting algorithm.

Question

What is the worst case time complexity of the Knuth-Morris Pratt algorithm? Explain.

Question

Describe one advantage and one disadvantage of using a linked list instead of an array.

Question

Construct a trie from these words:

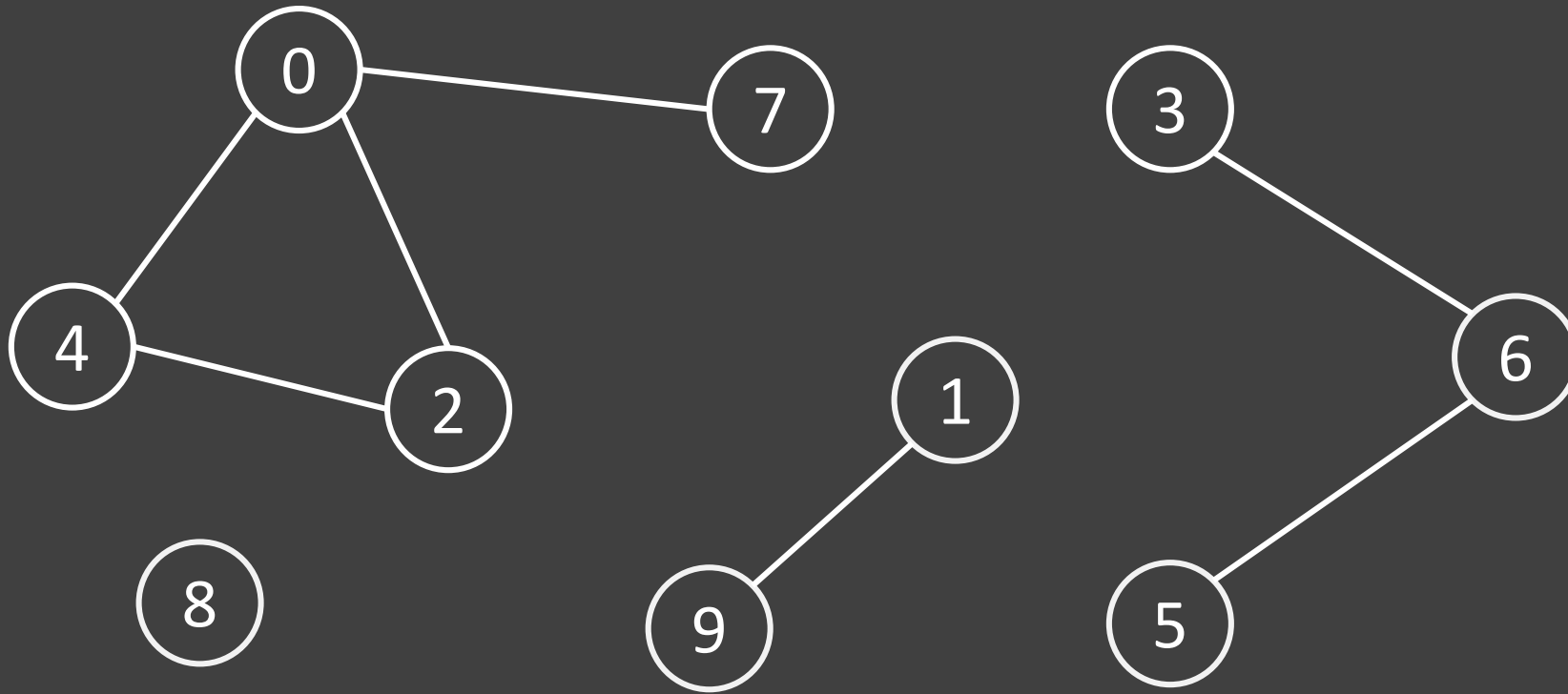
trees, trie, tree, try, teal, tie, tea

How many nodes does it contain?

How many finishing nodes does it contain?

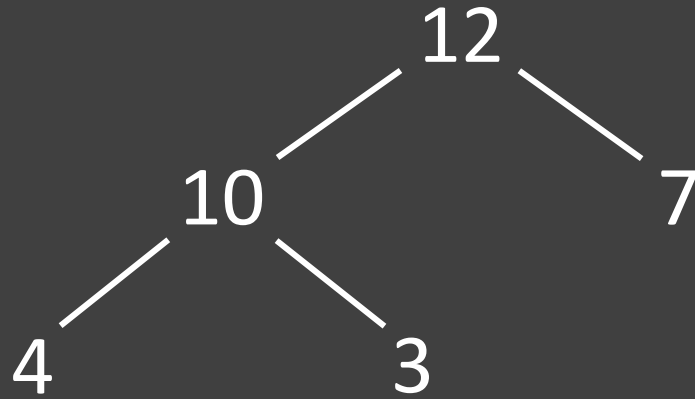
Question

Give a possible connected components array for this graph:



Question

Consider the following max heap.



Show the result of deleting the largest item.

Question

Consider the following hash table of size $N = 11$. It uses the primary hash function $h_1(x) = x \% 11$, and uses double hashing to resolve collisions, with the secondary hash function $h_2(x) = x \% 5 + 1$.

0	1	2	3	4	5	6	7	8	9	10
	21	14	9			17		8	30	6

Suppose 47 was inserted into the table. At what index will it end up? How many comparisons are made in the process?