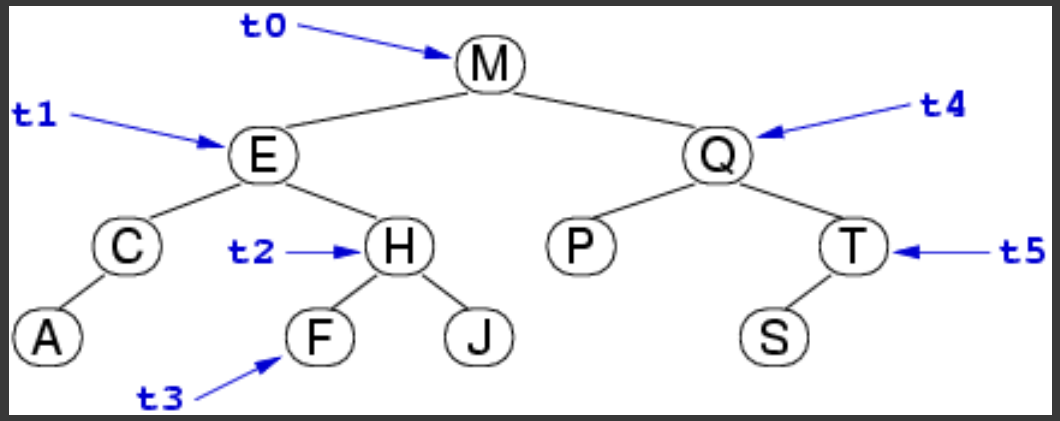
COMP2521 C Trivia Round 1

Question

a) What is the height of the tree in the illustration?
b) What is the height of the subtree t4?



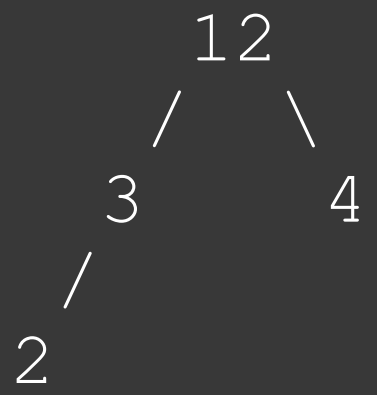
Question

a) What is the minimum height of a binary tree with 8 nodes? Draw a possible 8 node tree with this height.

b) What is the maximum height of a binary tree with 8 nodes? Draw a possible 8 node tree with this height.

Question

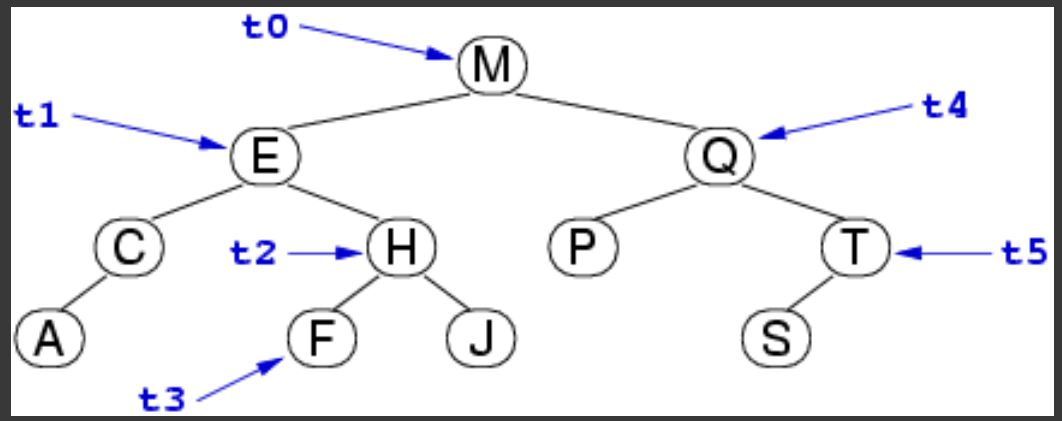
Suppose you have the following max heap.



Show the result of deleting the highest priority item.

Question

Perform a pre-order traversal of this tree

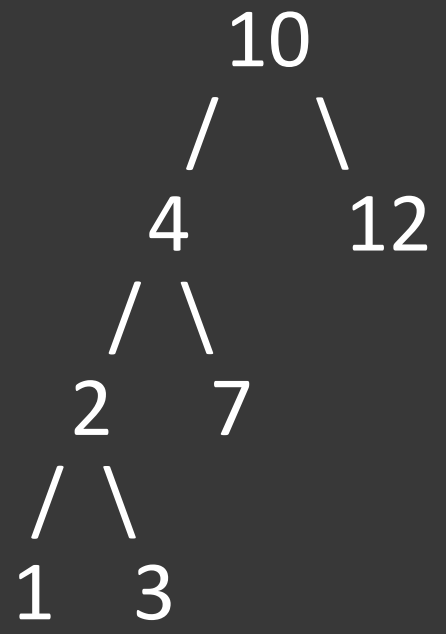


Question

Describe one disadvantage of using a linked list instead of array to store a list of objects of similar type (e.g. a list of integers)

Question

Show the result of a right rotation at node with value 4 in it in the following tree

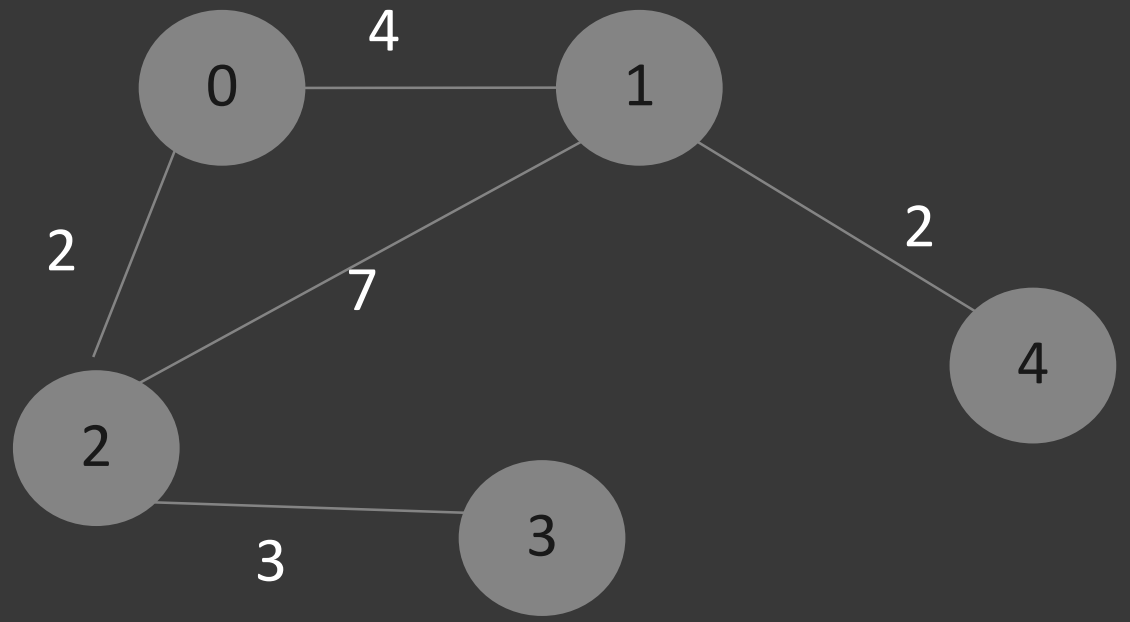


Question

Associate a cost and a formula expressing the number of times that each line of C code will be executed. And use big-O notation to express the time complexity of this code

```
for(int i = 0; i < n; i++){
    for(int j = i; j < n; j++){
        if( (i)%2 == 0){
            printf("%d %d\n",i,j);
        }
    }
}
```

Question



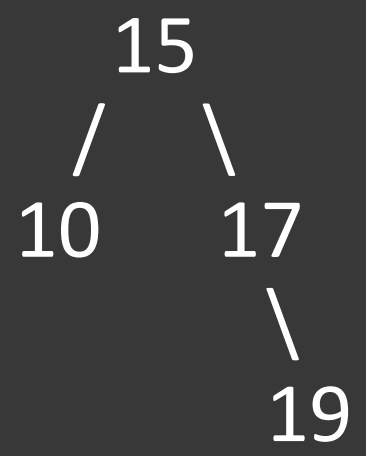
Show the st and dist arrays at each step when performing Dijkstra's algorithm starting from node 3. What is the shortest path from 3 to 4

Question

Show the following numbers after each iteration of sorting with an LSD radix sort, with a radix of 10.
4123 5123 4321 4132 1999

Question

Show the result of inserting 1 into the following splay tree

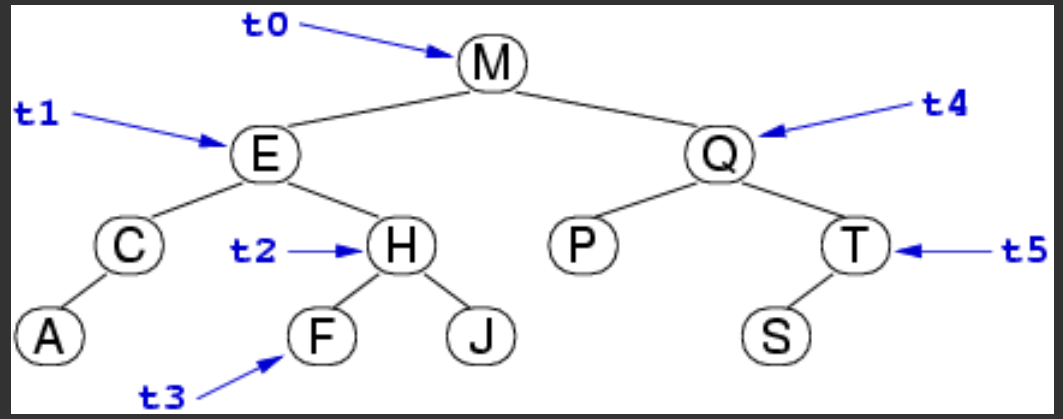


Hand in your answer sheets

Or one person from each team can submit via
give cs2521 trivia1 Answers.txt

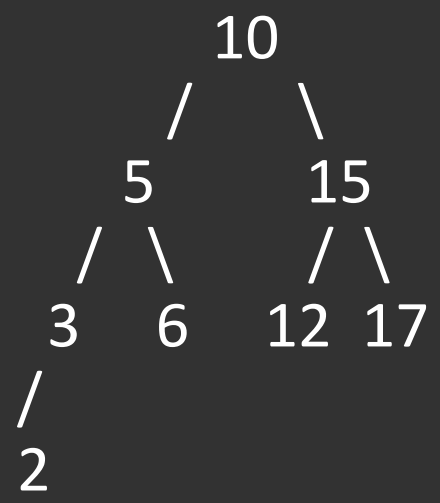
Answer

a) What is the height of the tree in the illustration? 3
b) What is the height of the subtree t4? 2

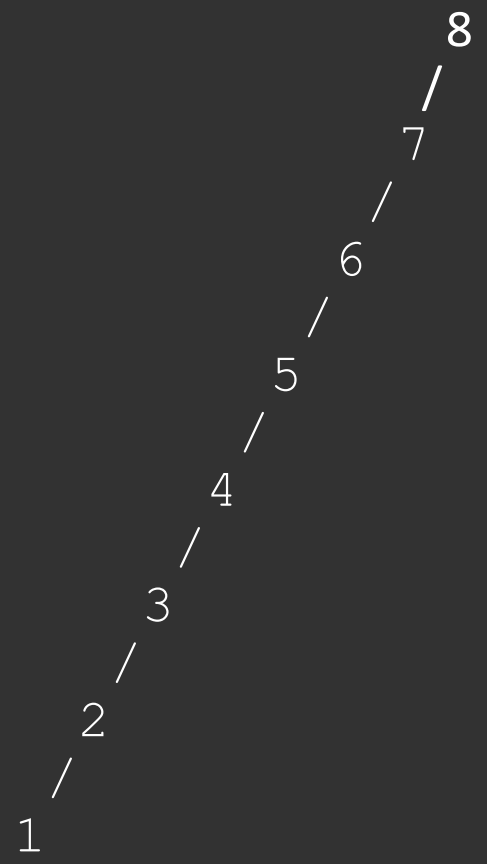


Answer

A) What is the minimum height of a binary tree with 8 nodes? Draw a possible 8 node tree with this height. 3



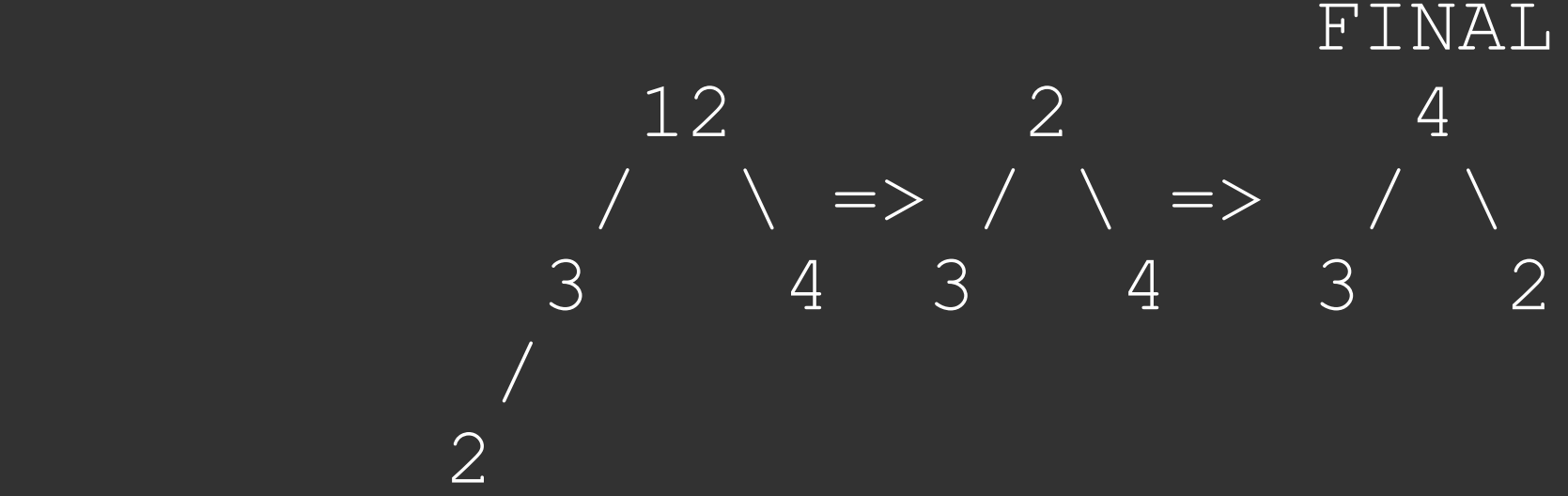
Answer



b) What is the maximum height of a binary tree with 8 nodes? Draw a possible 8 node tree with this height. 7

Answer

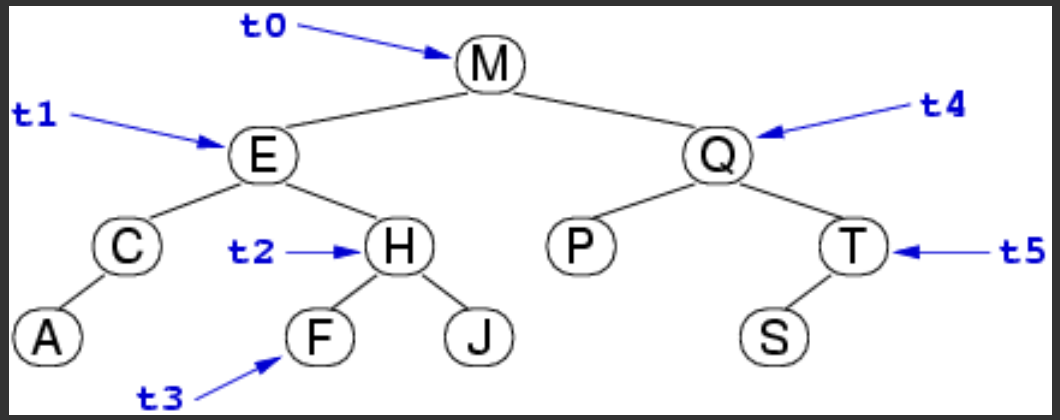
Suppose you have the following max heap.



Show the result of deleting the highest priority item.

Answer

Perform a pre-order traversal of this tree



M E C A H F J Q P T S

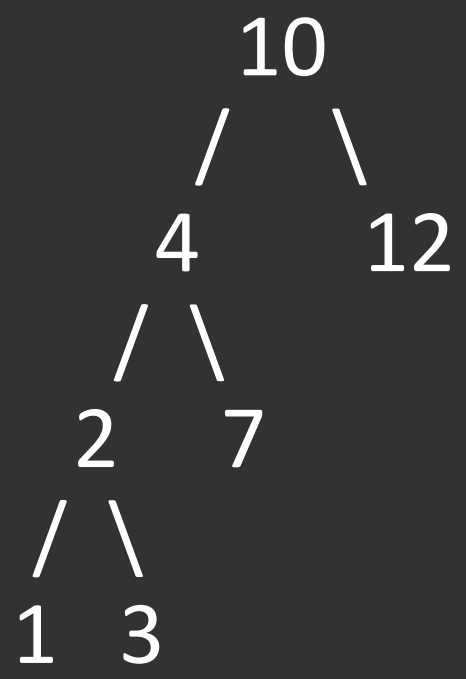
Answer

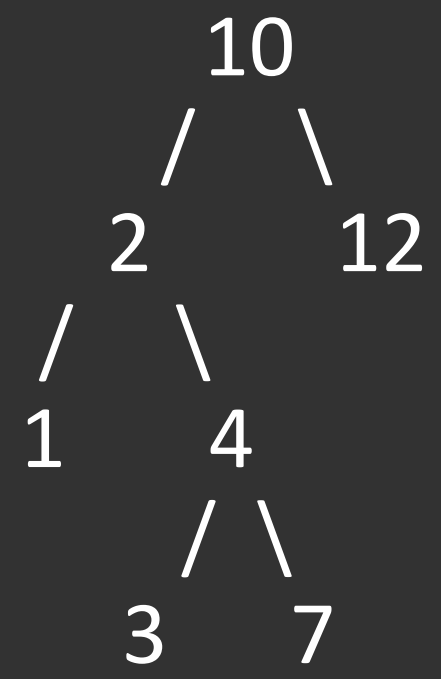
Describe one disadvantage of using a linked list instead of array to store a list of objects of similar type (e.g. a list of integers)

No random access in a linked list. O(n) to access an element at a particular index

Answer

Show the result of a right rotation at node with value 4 in it in the following tree





Answer

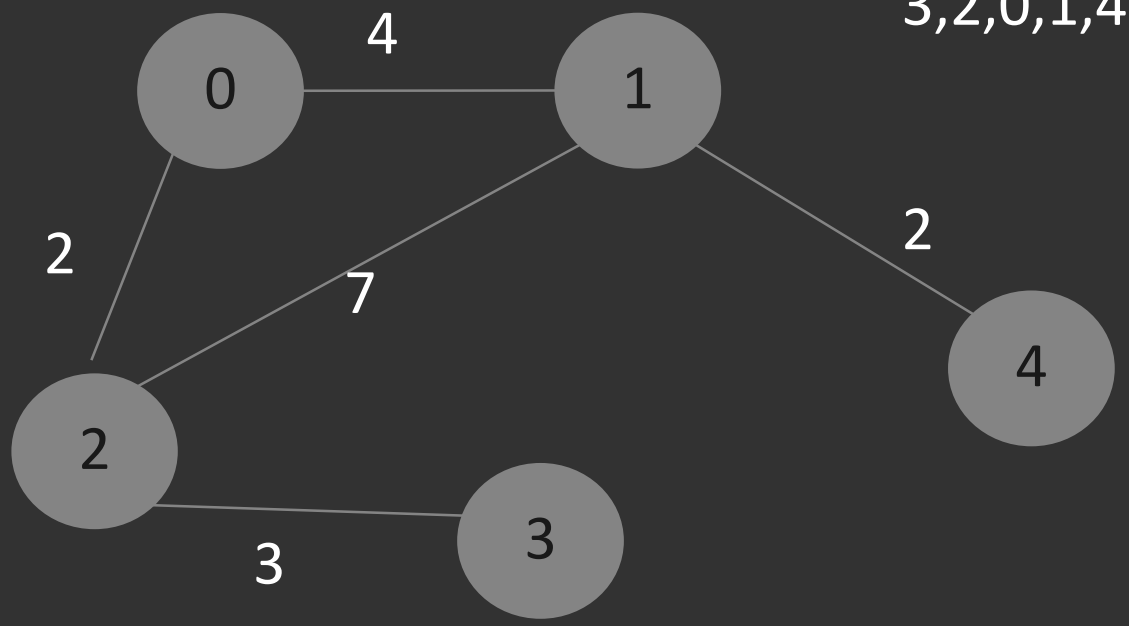
Associate a cost and a formula expressing the number of times that each line of C code will be executed. And use big-O notation to express the time complexity of this code

```
for(int i = 0; i < n; i++){          n+1
    for(int j = i; j < n; j++){      n+1 + n + .. + 2
                                   = ((n+1)(n+2))/2 -1

        if((i)%2 == 0){              n + n-1 + ..+1
                                     = n(n+1)/2
 //HARD: WOULD NOT Expect this next line to be exact
            printf("%d %d\n",i,j); = (n(n+2))/4
        }
    }
}
```

O(n^2)

Answer



3,2,0,1,4 is the path

- Show the st and dist arrays at each step when performing Dijkstra's algorithm starting from node 3. What is the shortest path from 3 to 4

dist	5	9	3	0	11
st	2	0	3	-	1
	0	1	2	3	4

Answer

Show the following numbers after each iteration of sorting with an LSD radix sort, with a radix of 10.

4123 5123 4321 4132 1999

4321 4132 4123 5123 1999
4321 4123 5123 4132 1999
4123 5123 4132 4321 1999
1999 4123 4132 4321 5123

Answer

Show the result of inserting 1 into the following splay tree