

In threaded binary tree, zeros/NULL links are represented by pointers called threads.

These threads are constructed using following rules:-

- ① A ^{NULL} zero left child field in a node say p is replaced by a pointer to the node that would be visited after p when traversing the p in order traversal i.e. it is replaced by the inorder successor of p
- ② A zero right child field of node p is replaced by the pointer to the node that immediately precedes node p in order



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Microsoft Whiteboard

← immediates

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② A zero left child field of node p is replaced by the pointer to the node that immediately precedes node in order i.e. it is replaced by the inorder predecessor of p

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replaced by the header pointer of p

Dummy node

In order traversal

H D I B E A F C G

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```

struct node {
    boolean leftThread;
    struct node *rlink;
    int data;
    struct node *rlink;
    boolean rightThread;
}
  
```



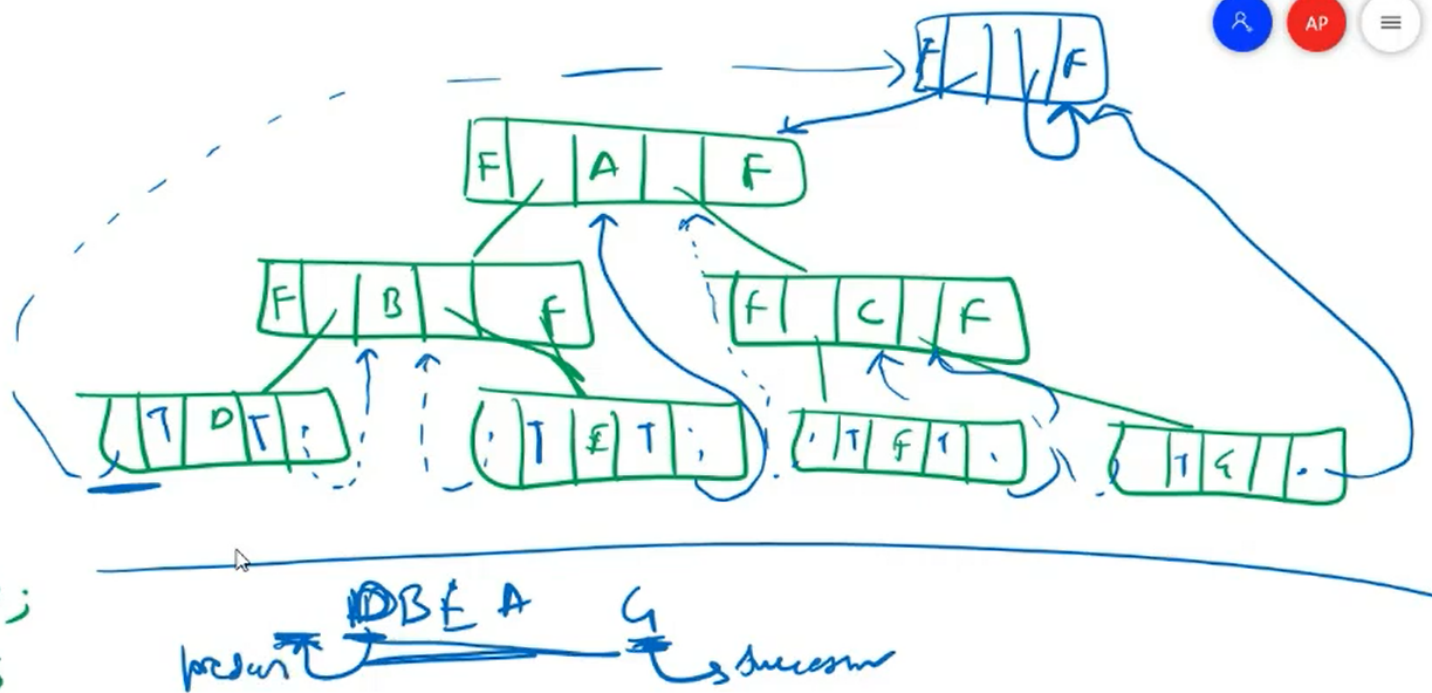
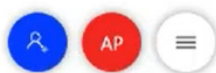
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Advantages of Threaded Binary Tree:

- In threaded binary tree, linear and fast traversal of nodes in the tree so there is no requirement of stack. If the stack is used then it consumes a lot of memory and time.
- It is more general as one can efficiently determine the successor and predecessor of any node by simply following the thread and links. It almost behaves like a circular linked list.

Disadvantages of Threaded Binary Tree:

- When implemented, the threaded binary tree needs to maintain the extra information for each node to indicate whether the link field of each node points to an ordinary node or the node's successor and predecessor.
- Insertion into and deletion from a threaded binary tree are more time consuming since both threads and ordinary links need to be maintained.

level — } Queue
DFS
L → m — }
L → m — } Stack
L → m — }
Stack / Queue

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