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#include <stdio.h>
#include <stdlib.h>
// Node structure to define the structure of the node
typedef struct Node
{
    int data;
    struct Node *left, *right;
} Node;
// Function to create a new node
Node *newNode(int val)
{
    Node *temp = (Node *)malloc(sizeof(Node));
    temp->data = val;
    temp->left = temp->right = NULL;
    return temp;
}
// Function to insert nodes
Node *insert(Node *root, int data)
{
    // If tree is empty, new node becomes the root
    if (root == NULL)
    {
        root = newNode(data);
        return root;
    }
    // Queue to traverse the tree and find the position to insert the node
    Node *queue[100];
    int front = 0, rear = 0;
    queue[rear++] = root;
    while (front != rear)
    {
        Node *temp = queue[front++];
        // Insert node as the left child of the parent node
        if (temp->left == NULL)
        {
            temp->left = newNode(data);
            break;
        }
        // If the left child is not null, push it to the queue
        else
            queue[rear++] = temp->left;
        // Insert node as the right child of parent node
        if (temp->right == NULL)
        {
            temp->right = newNode(data);
            break;
        }
        // If the right child is not null, push it to the queue
        else
            queue[rear++] = temp->right;
    }
    return root;
}
/* Function to delete the given deepest node (d_node) in binary tree */
void deleteDeepest(Node *root, Node *d_node)
{
    Node *queue[100];
    int front = 0, rear = 0;
    queue[rear++] = root;
    // Do level order traversal until last node
    Node *temp;
    while (front != rear)
    {
        temp = queue[front++];
        if (temp == d_node)
        {
            temp = NULL;
            free(d_node);
            return;
        }
        if (temp->right)
        {
            if (temp->right == d_node)
            {
                temp->right = NULL;
            }
        }
    }
}

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        free(d_node);
        return;
    }
    else
        queue[rear++] = temp->right;
}
if (temp->left)
{
    if (temp->left == d_node)
    {
        temp->left = NULL;
        free(d_node);
        return;
    }
    else
        queue[rear++] = temp->left;
}
}
}

/* Function to delete element in binary tree */
Node *deletion(Node *root, int key)
{
    if (!root)
        return NULL;
    if (root->left == NULL && root->right == NULL)
    {
        if (root->data == key)
            return NULL;
        else
            return root;
    }
    Node *queue[100];
    int front = 0, rear = 0;
    queue[rear++] = root;
    Node *temp;
    Node *key_node = NULL;
    // Do level order traversal to find deepest node (temp) and node to be deleted (key_node);

    while (front != rear)
    {
        temp = queue[front++];
        if (temp->data == key)
            key_node = temp;
        if (temp->left)
            queue[rear++] = temp->left;
        if (temp->right)
            queue[rear++] = temp->right;
    }
    if (key_node != NULL)
    {
        int x = temp->data;
        key_node->data = x;
        deletDeepest(root, temp);
    }
    return root;
}

// Inorder tree traversal (Left - Root - Right)
void inorderTraversal(Node *root)
{
    if (!root)
        return;
    inorderTraversal(root->left);
    printf("%d ", root->data);
    inorderTraversal(root->right);
}

// Preorder tree traversal (Root - Left - Right)
void preorderTraversal(Node *root)
{
    if (!root)
        return;
    printf("%d ", root->data);
    preorderTraversal(root->left);
    preorderTraversal(root->right);
}

// Postorder tree traversal (Left - Right - Root)

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void postorderTraversal(Node *root)
{
    if (root == NULL)
        return;
    postorderTraversal(root->left);
    postorderTraversal(root->right);
    printf("%d ", root->data);
}
// Function for Level order tree traversal
void levelorderTraversal(Node *root)
{
    if (root == NULL)
        return;
    // Queue for level order traversal
    Node *queue[100];
    int front = 0, rear = 0;
    queue[rear++] = root;
    while (front != rear)
    {
        Node *temp = queue[front++];
        printf("%d ", temp->data);
        // Push left child in the queue
        if (temp->left)
            queue[rear++] = temp->left;
        // Push right child in the queue
        if (temp->right)
            queue[rear++] = temp->right;
    }
}
/* Driver function to check the above algorithm. */
int main()
{
    Node *root = NULL;
    // Insertion of nodes
    root = insert(root, 10);
    root = insert(root, 20);
    root = insert(root, 30);
    root = insert(root, 40);
    printf("Preorder traversal: ");
    preorderTraversal(root);
    printf("\nInorder traversal: ");
    inorderTraversal(root);
    printf("\nPostorder traversal: ");
    postorderTraversal(root);
    printf("\nLevel order traversal: ");
    levelorderTraversal(root);
    // Delete the node with data = 20
    root = deletion(root, 20);
    printf("\nInorder traversal after deletion: ");
    inorderTraversal(root);
    return 0;
}

```