**TITLE 30**

Create a binary tree and output the data with 3 tree traversals

**OBJECTIVE:**

By the end of this problem we will be able to create a binary tree and output the data with the three tree traversals

**PROBLEM STATEMENT:**

In this problem we create a binary tree and the output of the data with three tree traversals is given.

Once the input is entered and stored then the output is printed.

**ALGORITHM:**

START

Define variables: data

INPUT: Read from the keyboard

COMPUTATION: Compute the binary tree

DISPLAY: The data with 3 tree traversals is displayed as the output

STOP

**PROGRAM:**

#include <stdio.h>

#include <stdlib.h>

struct node

{

     int data;

     struct node\* left;

     struct node\* right;

};

struct node\* newNode(int data)

{

     struct node\* node = (struct node\*)

                                  malloc(sizeof(struct node));

     node->data = data;

     node->left = NULL;

     node->right = NULL;

     return(node);

}

void printPostorder(struct node\* node)

{

     if (node == NULL)

        return;

     printPostorder(node->left);

     printPostorder(node->right);

     printf("%d ", node->data);

}

void printInorder(struct node\* node)

{

     if (node == NULL)

          return;

     printInorder(node->left);

     printf("%d ", node->data);

     printInorder(node->right);

}

void printPreorder(struct node\* node)

{

     if (node == NULL)

          return;

     printf("%d ", node->data);

     printPreorder(node->left);

     printPreorder(node->right);

}

int main()

{

     struct node \*root  = newNode(32);

     root->left             = newNode(42);

     root->right           = newNode(13);

     root->left->left     = newNode(44);

     root->left->right   = newNode(65);

     printf("\nPreorder traversal of binary tree is \n");

     printPreorder(root);

     printf("\nInorder traversal of binary tree is \n");

     printInorder(root);

     printf("\nPostorder traversal of binary tree is \n");

     printPostorder(root);

     getchar();

     return 0;

}

**CONCLUSION:**

The simulation of the above C program helped me enhance my knowledge on the three types of tree traversal which will make it easier for me to write other C programs.

**OUTPUT:**

Preorder traversal of binary tree is

32 42 44 65 13

Inorder traversal of binary tree is

44 42 65 32 13

Postorder traversal of binary tree is

44 65 42 13 32