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**LAB 9 = BINARY SEARCH TREE TRAVERSAL**

QUESTION: Write a program to: a) to construct a binary search tree. b) to traverse the tree using all the methods i.e., in-order, preorder and post order c) to display the elements in the tree.

CODE:

#include <stdio.h>

#include <stdlib.h>

struct node

{

int value;

struct node \*left;

struct node \*right;

}\*root = NULL, \*temp = NULL, \*t2, \*t1;

void insert();

void search(struct node \*t);

void inorder(struct node \*t);

void preorder(struct node \*t);

void postorder(struct node \*t);

void main()

{

int ch;

while(1)

{

printf("\n\*\*\*MENU\*\*\*\n");

printf("1. Insert an element into tree\n");

printf("2. Inorder Traversal\n");

printf("3. Preorder Traversal\n");

printf("4. Postorder Traversal\n");

printf("5. Exit\n");

printf("\nEnter your choice : ");

scanf("%d", &ch);

switch (ch)

{

case 1:

insert();

break;

case 2:

printf("\nINORDER TRAVERSAL:\n");

inorder(root);

break;

case 3:

printf("\nPREORDER TRAVERSAL:\n");

preorder(root);

break;

case 4:

printf("\nPOSTORDER TRAVERSAL:\n");

postorder(root);

break;

case 5:

exit(0);

default :

printf("Invalid Choice!\n");

break;

}

}

}

void insert()

{

int data;

printf("Enter data to be inserted : ");

scanf("%d", &data);

temp = (struct node\*)malloc(1\*sizeof(struct node));

temp->value = data;

temp->left = temp->right = NULL;

if (root == NULL)

root = temp;

else

search(root);

}

void search(struct node \*t)

{

if ((temp->value > t->value) && (t->right != NULL))

search(t->right);

else if ((temp->value > t->value) && (t->right == NULL))

t->right = temp;

else if ((temp->value < t->value) && (t->left != NULL))

search(t->left);

else if ((temp->value < t->value) && (t->left == NULL))

t->left = temp;

}

void inorder(struct node \*t)

{

if (root == NULL)

{

printf("No elements in the tree!\n");

return;

}

if (t->left != NULL)

inorder(t->left);

printf("%d -> ", t->value);

if (t->right != NULL)

inorder(t->right);

}

void preorder(struct node \*t)

{

if (root == NULL)

{

printf("No elements in the tree!\n");

return;

}

printf("%d -> ", t->value);

if (t->left != NULL)

preorder(t->left);

if (t->right != NULL)

preorder(t->right);

}

void postorder(struct node \*t)

{

if (root == NULL)

{

printf("No elements in the tree!\n");

return;

}

if (t->left != NULL)

postorder(t->left);

if (t->right != NULL)

postorder(t->right);

printf("%d -> ", t->value);

}

OUTPUT:







