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Binary Search Tree

Q. Write a program to construct a binary search tree, and to traverse the tree using all methods, i.e, in-order, pre-order and post order.

```
#include <stdio.h>
#include <stdlib.h>

struct Node {
    int data;
    struct Node * left, * right;
};

typedef struct Node node;

node * createNode ( int data) {
    node * new1 = (node *) malloc ( sizeof (node));
    new1 -> data = data;
    new1 -> left = NULL;
    new1 -> right = NULL;
    return new1;

node * insertNode (node * root, int data) {
    if (root == NULL) {
        return createNode (data);
    }
    if (data < root -> data) {
        root -> left = insertNode (root -> left, data);
    } else {
        root -> right = insertNode (root -> right, data);
    }
    return root;
```

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```
void inOrderTraversal (node * root) {
    if (root != NULL) {
        inorder Traversal (root -> left);
        printf ("%d", root -> data);
        inordu Traversal (root -> right);
    }
}

void preorderTraversal (node * root ) {
    if (root != NULL) {
        printf ("%d", root -> data);
        preordr Traversal (root -> left);
        preorder Traversal (root -> right);
    }
}

Void postorderTraversal (node * root) {
    if (robot != NULL) {
        postorder Traversal ( root -> left);
        postordr Traversal (root -> right);
        printf ("%d", root -> data);
    }
}

void main () {
    node * root = NULL;
    int choice, value;
    while (1) {
        printf ("\n1. Insert \n2. In-order Traversal \n3. Pre-Ordr
        Traversal \n4. Post-Ordr Traversal \n5. Exit \n");
        printf ("Enter Your Choice: ");
        Scanf ("%d", & choice);
```

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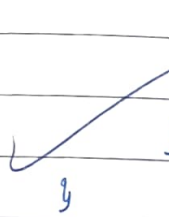
```
switch (choice) {
    case 1:
        printf("Enter Value to Insert: ");
        scanf("%d", &value);
        root = insertNode(root, value);
        break;
    case 2:
        printf("In-Order Traversal");
        inorderTraversal(root);
        break;
    case 3:
        printf("Pre-Order Traversal");
        preorderTraversal(root);
        break;
    case 4:
        printf("Post-Order Traversal");
        postorderTraversal(root);
        break;
    case 5:
        exit(0);
    }
}
```



Output

1. Insert
2. In-Order Traversal
3. Pre-Order Traversal
4. Post-Order Traversal
5. Exit

→ Enter Your Choice: 1

Enter Value to Insert: 50

→ Enter Your Choice: 1
Enter Value to Insert: 40

→ Enter Your Choice : 1
Enter Value to Insert : 75

→ Enter Your Choice: 1
Enter Value to Insert: 10

→ Enter Your Choice: 1
Enter Value to Insert: 25

→ Enter Your Choice: 1
Enter Value to Insert: 80

→ Enter Your Choice: 1
Enter Value to Insert: 20

→ Enter Your Choice: 2
In-Order Traversal: 10 20 25 40 50 75 80

→ Enter Your Choice: 3
Pre-Order Traversal: 50 40 10 25 20 75 80

→ Enter Your Choice: 4
Post-Order Traversal: 20 25 10 40 80 75 50

→ Enter Your Choice: 5
Tree Representation:

80

75

50

40

25

20