Program 8

Write a program

- 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 data;
  struct Node* left;
  struct Node* right;
};
struct Node* createNode(int data) {
  struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
  newNode->data = data;
  newNode->left = NULL;
  newNode->right = NULL;
  return newNode;
}
struct Node* insert(struct Node* root, int data) {
  if (root == NULL) {
     return createNode(data);
  if (data < root->data) {
     root->left = insert(root->left, data);
  } else if (data > root->data) {
     root->right = insert(root->right, data);
  return root;
}
void inOrder(struct Node* root) {
  if (root != NULL) {
     inOrder(root->left);
    printf("%d", root->data);
    inOrder(root->right);
  }
}
void preOrder(struct Node* root) {
  if (root != NULL) {
     printf("%d ", root->data);
     preOrder(root->left);
```

```
preOrder(root->right);
  }
}
void postOrder(struct Node* root) {
  if (root != NULL) {
     postOrder(root->left);
     postOrder(root->right);
    printf("%d ", root->data);
  }
}
int main() {
  struct Node* root = NULL;
  int n, value;
  printf("Enter the number of elements to insert in the BST: ");
  scanf("%d", &n);
  printf("Enter %d elements:\n", n);
  for (int i = 0; i < n; i++) {
     scanf("%d", &value);
    root = insert(root, value);
  printf("\nIn-order Traversal: ");
  inOrder(root);
  printf("\nPre-order Traversal: ");
  preOrder(root);
  printf("\nPost-order Traversal: ");
  postOrder(root);
  return 0;
}
   Enter the number of elements to insert in the BST: 5
   Enter 5 elements:
   12 23 45 65 3
   In-order Traversal: 3 12 23 45 65
   Pre-order Traversal: 12 3 23 45 65
   Post-order Traversal: 3 65 45 23 12
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