

1 /* PRACTICAL-6: Implementation of Binary Search Trees.

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7 // CODE:

8

9 import java.util.Scanner;

10 class TreeNode {

11 int data;

12 TreeNode left;

13 TreeNode right;

14 public TreeNode(int data) {

15 this.data = data;

16 this.left = null;

17 this.right = null;

18 }

19 }

20 class BinarySearchTree {

21 private TreeNode root;

22 public BinarySearchTree() {

23 root = null;

24 }

25 public void insert(int data) {

26 root = insertRec(root, data);

27 }

28 private TreeNode insertRec(TreeNode root, int data) {

29 if (root == null) {

30 root = new TreeNode(data);

31 return root;

32 }

33 if (data < root.data)

34 root.left = insertRec(root.left, data);

35 else if (data > root.data)

36 root.right = insertRec(root.right, data);

37

38 return root;

39 }

40 public void inorder() {

41 inorderRec(root);

42 }

43 private void inorderRec(TreeNode root) {

44 if (root != null) {

45 inorderRec(root.left);

46 System.out.print(root.data + " ");

47 inorderRec(root.right);

48 }

49 }

50 public void preorder() {

51 preorderRec(root);

52 }

53 private void preorderRec(TreeNode root) {

54 if (root != null) {

55 System.out.print(root.data + " ");

56 preorderRec(root.left);

57 preorderRec(root.right);

58 }

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59     }
60     public void postorder() {
61         postorderRec(root);
62     }
63     private void postorderRec(TreeNode root) {
64         if (root != null) {
65             postorderRec(root.left);
66             postorderRec(root.right);
67             System.out.print(root.data + " ");
68         }
69     }
70 }
71 public class practical6 {
72     public static void main(String[] args) {
73         Scanner scanner = new Scanner(System.in);
74         BinarySearchTree bst = new BinarySearchTree();
75         int choice;
76         do {
77             System.out.println("\nBinary Search Tree Operations:");
78             System.out.println("1. Insert");
79             System.out.println("2. Inorder Traversal");
80             System.out.println("3. Preorder Traversal");
81             System.out.println("4. Postorder Traversal");
82             System.out.println("5. Exit");
83             System.out.print("Enter your choice: ");
84             choice = scanner.nextInt();
85             switch (choice) {
86                 case 1:
87                     System.out.print("Enter element to insert: ");
88                     int element = scanner.nextInt();
89                     bst.insert(element);
90                     break;
91                 case 2:
92                     System.out.print("Inorder Traversal: ");
93                     bst.inorder();
94                     System.out.println();
95                     break;
96                 case 3:
97                     System.out.print("Preorder Traversal: ");
98                     bst.preorder();
99                     System.out.println();
100                    break;
101                 case 4:
102                     System.out.print("Postorder Traversal: ");
103                     bst.postorder();
104                     System.out.println();
105                     break;
106                 case 5:
107                     System.out.println("Exiting...");
108                     break;
109                 default:
110                     System.out.println("Invalid choice. Please enter a valid option.");
111             }
112         } while (choice != 5);
113         scanner.close();
114     }
115 }

```