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LAB EXAM

Write a Java program to

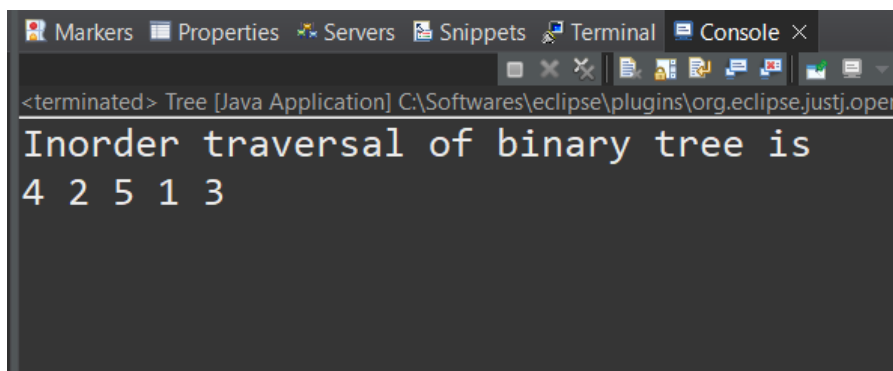
- a. Perform inorder tree traversal

```
public class Tree {  
    Node root;  
  
    public void inorderTraversal(Node node) {  
        if (node == null) {  
            return;  
        }  
        inorderTraversal(node.left);  
        System.out.print(node.data + " ");  
        inorderTraversal(node.right);  
    }  
  
    public static void main(String[] args) {  
        Tree tree = new Tree();  
        tree.root = new Node(1);  
        tree.root.left = new Node(2);  
        tree.root.right = new Node(3);  
        tree.root.left.left = new Node(4);  
        tree.root.left.right = new Node(5);  
        System.out.println("Inorder traversal of binary tree is ");  
        tree.inorderTraversal(tree.root);  
    }  
}  
  
class Node {  
    int data;  
    Node left, right;
```

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```
public Node(int item) {  
    data = item;  
    left = right = null;  
}  
}
```

Output: -



b. Implement stack using array

```
package com.main.stack;  
  
import java.util.Scanner;  
  
public class StackImp {  
    int top;  
  
    int maxsize = 10;  
  
    int[] arr = new int[maxsize];  
  
    boolean isEmpty()  
    {  
        return (top < 0);  
    }  
  
    StackImp()  
    {  
        top = -1;  
    }  
}
```

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```
}  
  
boolean push (Scanner sc)  
{  
    if(top == maxsize-1)  
    {  
        System.out.println("Overflow !!");  
        return false;  
    }  
    else  
    {  
        System.out.println("Enter Value");  
        int val = sc.nextInt();  
        top++;  
        arr[top]=val;  
        System.out.println("Item pushed");  
        return true;  
    }  
}  
  
boolean pop ()  
{  
    if (top == -1)  
    {  
        System.out.println("Underflow !!");  
        return false;  
    }  
    else  
    {  
        top --;  
        System.out.println("Item popped");  
        return true;  
    }  
}
```

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```
}  
  
void display ()  
{  
    System.out.println("Printing stack elements .....");  
    for(int i = top; i>=0;i--)  
    {  
        System.out.println(arr[i]);  
    }  
}  
  
public static void main(String[] args) {  
    int choice=0;  
    Scanner sc = new Scanner(System.in);  
    StackImp s = new StackImp();  
    System.out.println("*Stack operations using array*\n");  
    System.out.println("-----\n");  
    while(choice != 4)  
    {  
        System.out.println("Chose one from the below options...\n");  
        System.out.println("1.Push\n2.Pop\n3.Show\n4.Exit");  
        System.out.println("\n Enter your choice \n");  
        choice = sc.nextInt();  
        switch(choice)  
        {  
            case 1:  
            {  
                s.push(sc);  
                break;  
            }  
            case 2:  
            {
```

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```
        s.pop();  
        break;  
    }  
    case 3:  
    {  
        s.display();  
        break;  
    }  
    case 4:  
    {  
        System.out.println("Exiting....");  
        System.exit(0);  
        break;  
    }  
    default:  
    {  
        System.out.println("Please Enter valid choice ");  
    }  
}  
}
```

}Output: -

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```
Markers Properties Servers Snippets Terminal Console X
StackImp [Java Application] C:\Softwares\eclipse\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_17.0.4.v20220903-1038\jre\bin\java
*Stack operations using array*

-----

Chose one from the below options...

1.Push
2.Pop
3.Show
4.Exit

Enter your choice

1
Enter Value

10
Item pushed
Chose one from the below options...

1.Push
2.Pop
3.Show
4.Exit

Enter your choice

1
Enter Value

12
Item pushed
Chose one from the below options...

1.Push
2.Pop
3.Show
4.Exit
```

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```
4.Exit

Enter your choice

2
Item popped
Chose one from the below options...

1.Push
2.Pop
3.Show
4.Exit

Enter your choice

3
Printing stack elements .....
10
Chose one from the below options...

1.Push
2.Pop
3.Show
4.Exit

Enter your choice
```