College of Engineering, Thiruvananthapuram

Object Oriented Programming Lab Exam

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1 Binary Search

1.1 Aim

To Write a Java program that implements the binary search algorithm:

1.2 Algorithm

1.Start
2. Initialise an array with user input.
3. Accept user input for searching and store it in ‘key’
2.Create a function binarySearch() where array is passed along with the element to be searched and the low and high index value of the array
3. Now check the condition whether the required element is the mid one where mid = low + (high-low)/2
    3.1 If key < array(mid) then high = low-1
    3.2 If key > array(mid) then low = mid+1
6.Print the result whether the element is found and their respective position
7.Stop

1.3 Code

```
import java.util.Scanner;
public class BinarySearch {

    int binarySearch(int arr[], int start, int last, int key)
    {
        if (last >= start) {
            int mid = start + (last - start) / 2;

            if (arr[mid] == key)
                return mid;

            else if (arr[mid] > key)
                return binarySearch(arr, start, mid - 1, key);

            else
                return binarySearch(arr, mid + 1, last, key);
        }
        return -1;
    }

    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        BinarySearch ob = new BinarySearch();

        System.out.printf("Enter the size of the array : ");
        int n = sc.nextInt();
        int[] arr = new int[n];
        System.out.println("Enter the array : ");
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }

        System.out.printf("Enter the number to search : ");
        int key = sc.nextInt();

        int result = ob.binarySearch(arr, 0, n - 1, key);

        if (result == -1)
            System.out.println("Element not present");
        else
            System.out.println("Element found at index " + result);

        sc.close();
    }
}
```

1.4 Sample Output

```
Enter the size of the array : 5
Enter the array :
12 23 45 67 88
Enter the number to search : 12
Element found at index 0

e:\Anirudh\Anirudh\CET\SEM 3\OOP_Lab\Java_cycle_6\Lab_exam>
```

2 Currency Converter

2.1 Aim

To Write a GUI-based Currency Converter Java program that uses two text fields, two radio buttons, and a button. User enters the amount of ***Indian Rupees*** in the first text field as a floating-point number. Two radio buttons are provided to select either ***Dollar*** or ***Euro*** currency into which ***Indian Rupee*** must be converted. While clicking the ***convert*** button, ***Indian Rupee*** is converted into the currency corresponding to the selected radio button. The converted amount shall be displayed in the second text field. Use appropriate AWT/Swing components and event handling.

2.2 Algorithm

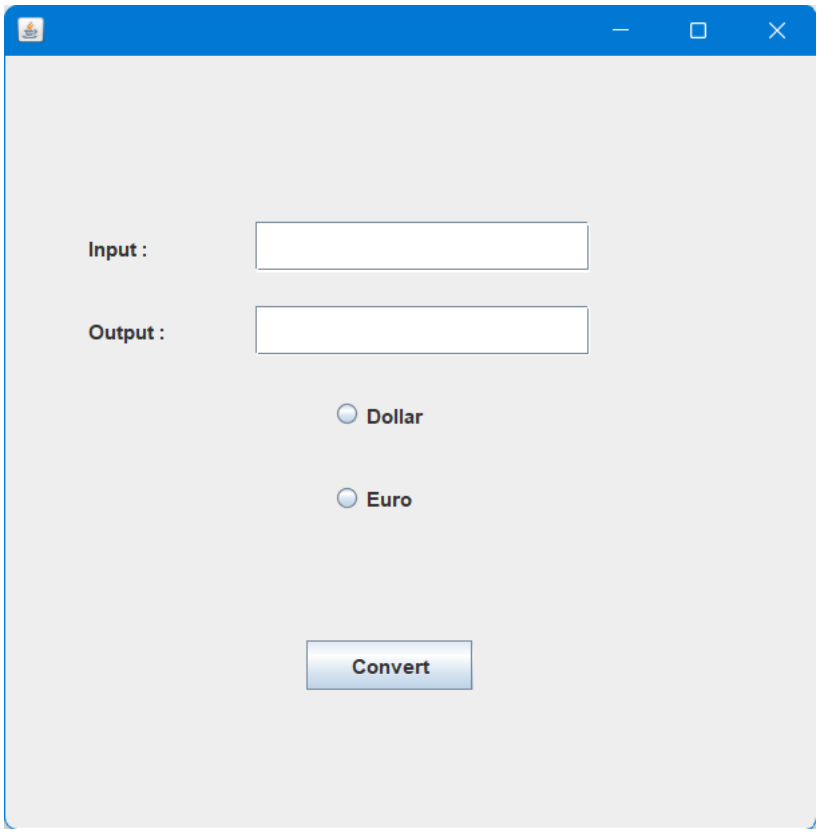
1. Start
2. Create a class CurrencyConverter that extends JFrame and implemets ActionListener.
3. Declare 2 text fields t1, t2. Declare radio buttons dollar, euro. And declare a button ‘convert’.
4. Define the class constructor as:
    a. Set appropriate bounds for the elements and add them to the window frame.
    b. If radio button ‘dollar’ is selected:
        i. Get user input from t1 and divide it by 76.43
        ii. Display the output through t2 on clicking ‘convert’ button.
    c. If radio button ‘euro’ is selected:
        i. Get user input from t1 and divide it by 83.53
        ii. Display the output through t2 on clicking ‘convert’ button.
5. Stop

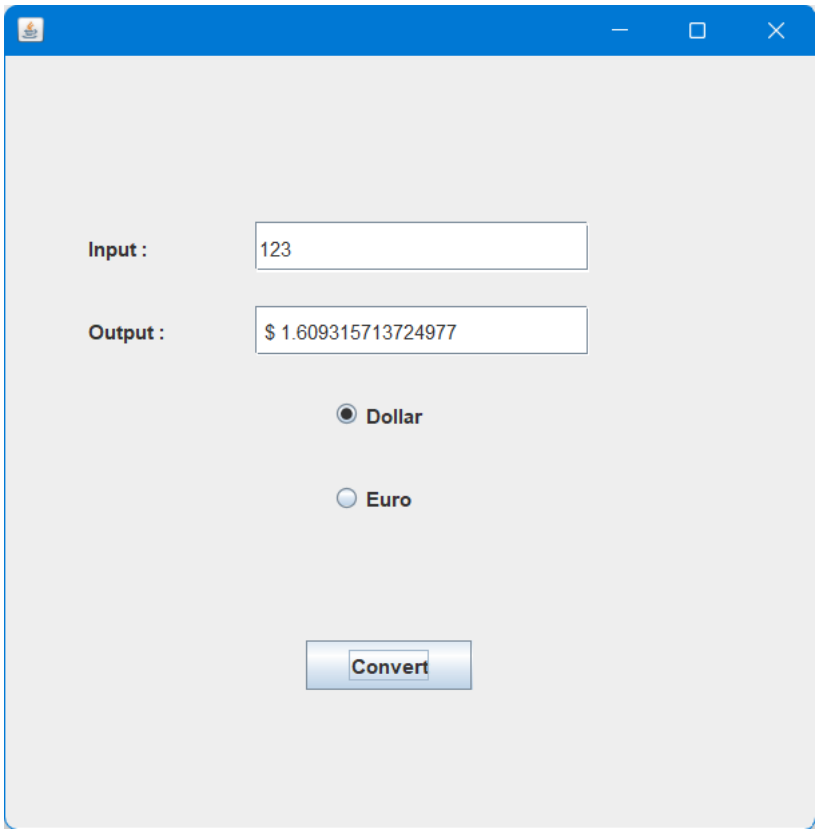
2.3 Code

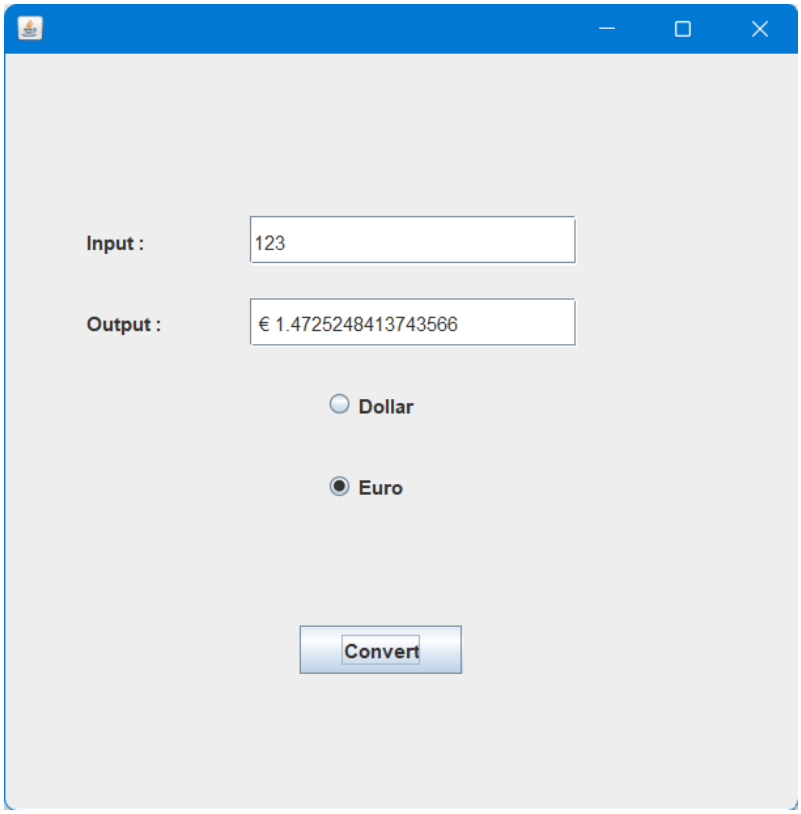
```
import javax.swing.*;
import java.awt.event.*;

public class CurrencyConverter extends JFrame implements ActionListener {
    JButton convert;
    JRadioButton D, E;
    ButtonGroup bg;
    JTextField t1, t2;
    JLabel l1, l2;

    CurrencyConverter() {
        JFrame frame = new JFrame();

        D = new JRadioButton("Dollar");
        E = new JRadioButton("Euro");

        bg = new ButtonGroup();

        convert = new JButton("Convert");

        t1 = new JTextField();
        t2 = new JTextField();

        l1 = new JLabel("Input : ");
        l2 = new JLabel("Output : ");

        // convert.setBounds(x, y, width, height);
        D.setBounds(195, 200, 100, 30);
        E.setBounds(195, 250, 100, 30);
        convert.setBounds(180, 350, 100, 30);
        t1.setBounds(150, 100, 200, 30);
        t2.setBounds(150, 150, 200, 30);
        l1.setBounds(50, 100, 100, 30);
        l2.setBounds(50, 150, 100, 30);

        bg.add(D);
        bg.add(E);

        // bg.add(convert);

        frame.add(D);
        frame.add(E);
        frame.add(convert);
        frame.add(t1);
        frame.add(t2);
        frame.add(l1);
        frame.add(l2);
```

```
        convert.addActionListener(this);

        frame.setLayout(null);
        frame.setSize(500, 500);
        frame.setVisible(true);
    }

    public void actionPerformed(ActionEvent e) {
        if (D.isSelected()) {
            // JOptionPane.showMessageDialog(this, "You are Male.");
            Double INR = Double.valueOf(t1.getText());
            // String str = String.valueOf(INR);
            // t1.setText(" ₹ " + str);
            double dollar = (INR / 76.43);
            String str1 = String.valueOf(dollar);
            t2.setText(" $ " + str1);
        }
        if (E.isSelected()) {
            Double INR = Double.valueOf(t1.getText());
            double euro = (INR / 83.53);
            String str2 = String.valueOf(euro);
            t2.setText(" € " + str2);
        }
    }

    public static void main(String[] args) {
        CurrencyConverter c = new CurrencyConverter();
    }
}
```

2.4 Sample Output






Input :
123
Output :
€ 1.4725248413743566
Dollar
Euro
Convert