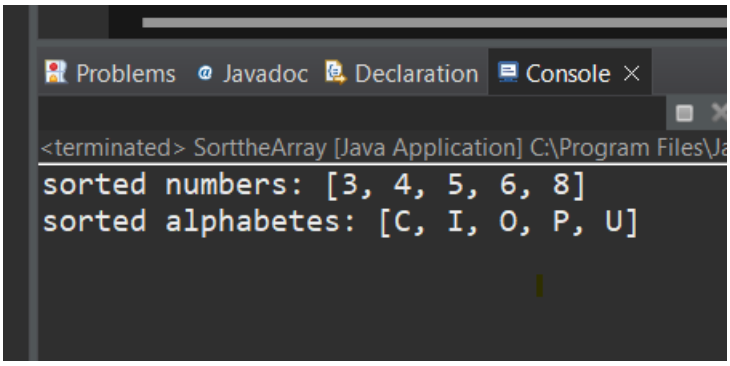
Lab6

1.Write the programme to sort the integers 8, 4, 3,5,6 and the alphabetical string C, O, I, P, U, in ascending order. Show the resulting output.

Code:

```
package lab6;

import java.util.*;

public class SorttheArray {


    public static void main(String[] args) {

        // TODO Auto-generated method stub

        int[] numbers= {8,4,3,5,6};

        char[] alphabeticals= {'C','O','I','P','U'};

        Arrays.sort(numbers);

        Arrays.sort(alphabeticals);

        System.out.println("sorted numbers: " +Arrays.toString(numbers));

        System.out.println("sorted alphabetes: " +Arrays.toString(alphabeticals));

    }


}
```

Output:



2. Write a Java program to implement the bubble sort algorithm to sort an array of integers in ascending order.

Code:

```
package lab6;
```

```
import java.lang.reflect.Array;
public class UsingBubbleSortAlgorithmToSortArray {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        int[] Array= {23,45,56,21,34,123};
        System.out.println("Unsorted Array:");
        printArray(Array);
        bubbleSort(Array);
        System.out.println("\nSorted Array: ");
        printArray(Array);
    }

    public static void printArray(int[] array) {
        // TODO Auto-generated method stub
        for (int num:array) {
            System.out.println(num+"");
        }
        System.out.println();

    }
    public static void bubbleSort(int[] array) {
        // TODO Auto-generated method stub
        int n = array.length;
        boolean swapped;
        for (int i=0;i<n-1; i++) {
            swapped = false;
            for(int j=0; j<n-1-i;j++) {
                if(array[j]> array[j + 1]) {
                    int temp=array[j];
                    array[j]=array[j+1];
                    array[j+1]=temp;
                    swapped=true;
```

```
                        }
                    }
            }
        }

    }
```

Output:

```
<terminated> UsingBubbleSortAlgorithmToSortArray [Java
Unsorted Array:
23
45
56
21
34
123


Sorted Array:
21
23
34
45
56
123
```

3. Write a program to input an array 10 elements and print the cube of prime numbers in it.

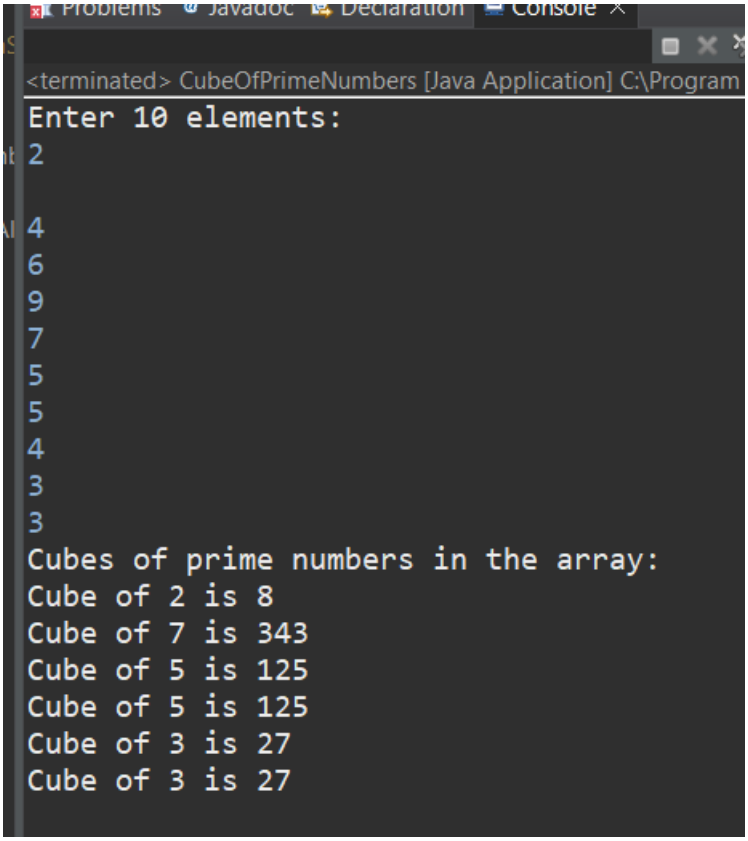
Code:

```
package lab6;

import java.util.Scanner;


public class CubeOfPrimeNumbers {


    // Function to check if a number is prime

    public static boolean isPrime(int num) {

            if (num <= 1) {
```

```
            return false;
        }
        for (int i = 2; i <= Math.sqrt(num); i++) {
            if (num % i == 0) {
                return false;
            }
        }
        return true;
    }

    // Function to calculate the cube of a number
    public static int cube(int num) {
        return num * num * num;
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int[] arr = new int[10];

        // Input 10 elements into the array
        System.out.println("Enter 10 elements:");
        for (int i = 0; i < 10; i++) {
            arr[i] = scanner.nextInt();
        }

        // Print the cube of prime numbers
        System.out.println("Cubes of prime numbers in the array:");
        for (int i = 0; i < 10; i++) {
            if (isPrime(arr[i])) {
                System.out.println("Cube of " + arr[i] + " is " + cube(arr[i]));
            }
        }
```

```
            scanner.close();
    }
}
```

Output:



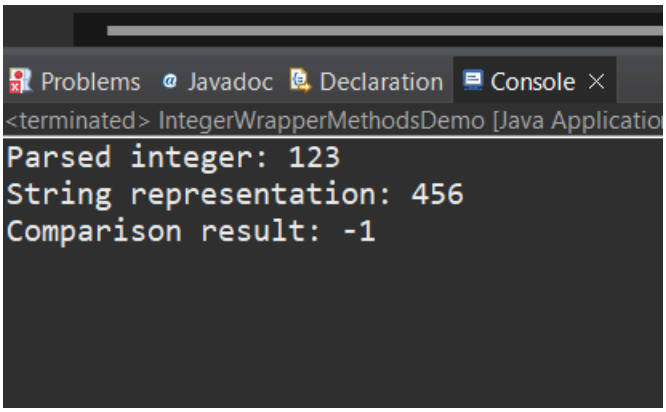
4. Write a java program to implement integer wrapper class methods.(any 3 methods)

Code:

```
package lab6;
public class IntegerWrapperMethodsDemo {
   public static void main(String[] args) {
      // Example 1: Using Integer.parseInt(String s)
      String numberStr = "123";
      int number = Integer.parseInt(numberStr);
      System.out.println("Parsed integer: " + number);

      // Example 2: Using Integer.toString(int i)
      int num = 456;
      String numStr = Integer.toString(num);
```

```
        System.out.println("String representation: " + numStr);


        // Example 3: Using Integer.compareTo(Integer anotherInteger)
        Integer int1 = 10;
        Integer int2 = 20;
        int comparisonResult = int1.compareTo(int2);
        System.out.println("Comparison result: " + comparisonResult); // -1 if int1 < int2
    }
}
```

Output:



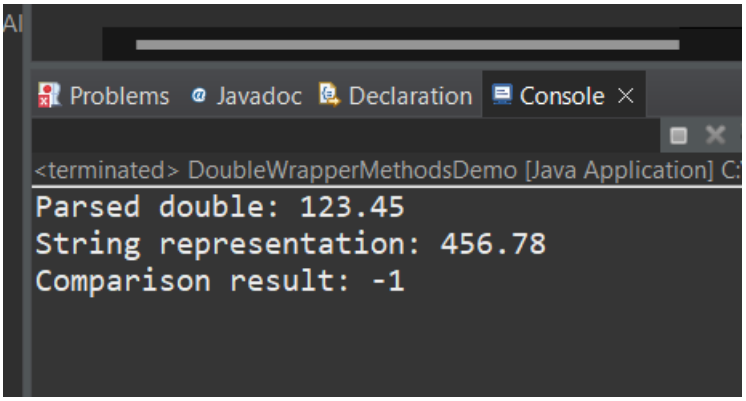
5. ***Write a java program to implement double wrapper class methods.(any 3 methods)***

Code:

```
package lab6;
public class DoubleWrapperMethodsDemo {
    public static void main(String[] args) {
        // Example 1: Using Double.parseDouble(String s)
        String doubleStr = "123.45";
        double number = Double.parseDouble(doubleStr);
        System.out.println("Parsed double: " + number);


        // Example 2: Using Double.toString(double d)
        double num = 456.78;
        String numStr = Double.toString(num);
        System.out.println("String representation: " + numStr);
```

```
        // Example 3: Using Double.compareTo(Double anotherDouble)
        Double double1 = 10.5;
        Double double2 = 20.5;
        int comparisonResult = double1.compareTo(double2);
        System.out.println("Comparison result: " + comparisonResult); // -1 if double1 < double2
    }
}
```

Output:



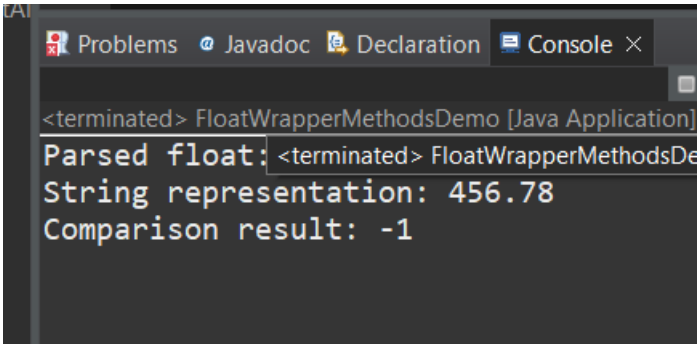
6. ***Write a java program to implement float wrapper class methods.(any 3 methods)***

Code:

```
package lab6;
public class FloatWrapperMethodsDemo {
    public static void main(String[] args) {
        // Example 1
        String floatStr = "123.45";
        float number = Float.parseFloat(floatStr);
        System.out.println("Parsed float: " + number);

        // Example 2
        float num = 456.78f;
        String numStr = Float.toString(num);
        System.out.println("String representation: " + numStr);
```

```
        // Example 3
        Float float1 = 10.5f;
        Float float2 = 20.5f;
        int comparisonResult = float1.compareTo(float2);
        System.out.println("Comparison result: " + comparisonResult); // -1 if float1 < float2
    }
}
```

Output:



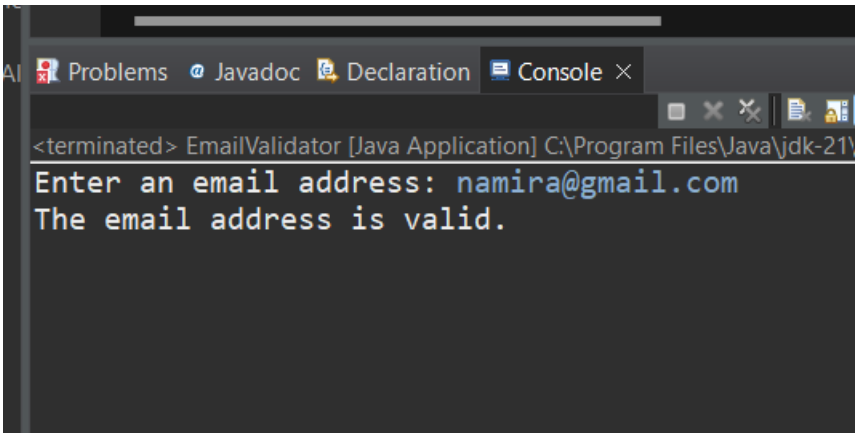
7. Write a Java program to validate email addresses using regular expressions. The email should have the format username@domain.com where username and domain can contain alphanumeric characters, dots, and hyphens.

Code:

```
package lab6;
import java.util.regex.Matcher;
import java.util.regex.Pattern;
import java.util.Scanner;

public class EmailValidator {
    // Regular expression for validating email
    private static final String EMAIL_REGEX = "^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\\.[a-zA-Z]{2,6}$";

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
```

```
        // Input email from user
        System.out.print("Enter an email address: ");
        String email = scanner.nextLine();

        // Validate email
        if (isValidEmail(email)) {
            System.out.println("The email address is valid.");
        } else {
            System.out.println("The email address is invalid.");
        }

        scanner.close();
    }

    // Method to validate email using regex
    public static boolean isValidEmail(String email) {
        Pattern pattern = Pattern.compile(EMAIL_REGEX);
        Matcher matcher = pattern.matcher(email);
        return matcher.matches();
    }
}
```

Output:



8. Create a Java program to validate phone numbers. The format should be (xxx) xxx-xxxx where x is a digit.

Code:

```
package lab6;
import java.util.regex.Matcher;
import java.util.regex.Pattern;
import java.util.Scanner;

public class PhoneNumberValidator {
    // Regular expression for validating phone numbers
    private static final String PHONE_REGEX = "^\\(\\d{3}\\) \\d{3}-\\d{4}$";

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

        // Input phone number from user
        System.out.print("Enter a phone number (format: (xxx) xxx-xxxx): ");
        String phoneNumber = scanner.nextLine();

        // Validate phone number
        if (isValidPhoneNumber(phoneNumber)) {
            System.out.println("The phone number is valid.");
        } else {
            System.out.println("The phone number is invalid.");
        }

        scanner.close();
    }
    // Method to validate phone number using regex
    public static boolean isValidPhoneNumber(String phoneNumber) {
        Pattern pattern = Pattern.compile(PHONE_REGEX);
```

```
        Matcher matcher = pattern.matcher(phoneNumber);
        return matcher.matches();
    }
}
```

Output: