Lab06

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✓ *Lab06.1*

```
import java.util.HashMap;
class AbstractMath{
    int reverseNumber(int num){
        return 0;
    }
    int roundedNumber(double num){
        return 0;
    }
    int countDistinct(int []values){
        return 0;
    }
    int decimalToBinary(int decimal){
        return 0;
    }
}
class Maths extends AbstractMath{
    int reverseNumber(int num){
        String strnum = num+"";
        String renum = "";
        for(int i=strnum.length()-1;i>=0;i--){
            renum += strnum.charAt(i);
        }
        return Integer.parseInt(renum);
    }
    int roundedNumber(double num){
        int result= 0;
        float nm=(float) ((int)num+0.5);
        if(num>=nm){
            result = (int)(nm+1);
        }else{
            result = (int)(num);
        }
        return result;
    }
    int countDistinct(int []values){
        HashMap<Integer,Integer> map = new HashMap<>();
        map.put(values[0],1);
        for(int i=1; i<values.length; i++){
            if(map.get(values[i])!=null){
                if(map.get(values[i])>0){
                    map.put(values[i],map.get(values[i])+1);
                }else{
                    map.put(values[i],1);
                }
            }else{
                map.put(values[i],1);
            }
        }
        int count=0;
        for(int i=0;i<values.length;i++){
            if(map.get(values[i])==1){
                count++;
            }
        }
        return count;
    }
    int decimalToBinary(int decimal){
        int a = 0;
        int bs10=decimal;
        int bs2=0;
        if(bs10>=0&&bs10<=15){
            a=4;
        }else if(bs10>15&&bs10<=255){
            a=8;
```

```
        }else if(bs10>225&&bs10<=4095){
            a=12;
        }else if(bs10>4095&&bs10<=65535){
            a=16;
        }else if(bs10>65535&&bs10<=1048575){
            a=20;
        }else if(bs10>1048575&&bs10<=16777215){
            a=24;
        }else if(bs10>16777215&&bs10<=268435455){
            a=28;
        }

        int[] bar=new int[a];
        for(int k=0;k<a;k++){
            bar[k]=0;
        }
        int i=0;
        do{
            if(bs10%2==1){
                bs2=1;
            }else if(bs10%2==0){
                bs2=0;
            }
            bs10=bs10/2;
            bar[i]=bs2;
            i++;
        }while(bs10>0);
        StringBuilder res= new StringBuilder();
        for(int j=a-1;j>=0;j--){
            res.append(bar[j]);
        }
        return Integer.parseInt(res.toString());
    }
}

public class Lab06_1 {
    public static void main(String[] args){
        Maths math=new Maths();
        System.out.println(math.reverseNumber(1234));
        System.out.println(math.roundedNumber(3.4));
        System.out.println(math.roundedNumber(3.6));
        int[] arr={-1,-1,1,0,1,5,9};
        int[] arr1={-5,1,0,6,5,0};
        System.out.println(math.countDistinct(arr1));
        System.out.println(math.decimalToBinary(20));
    }
}
```

```
public static void main(String[] args){
    Maths math=new Maths();
    System.out.println(math.reverseNumber(1234));
    System.out.println(math.roundedNumber(3.4));
    System.out.println(math.roundedNumber(3.6));
    int[] arr={-1,-1,1,0,1,5,9};
    int[] arr1={-5,1,0,6,5,0};
    System.out.println(math.countDistinct(arr1));
    System.out.println(math.decimalToBinary(20));
}
```

```
4321
3
4
4
10100
```

✓ Lab06.2

```
import java.util.ArrayList;
import java.util.Scanner;
class math{
```

```
int sum(int a,int b){
    return a+b;
}
int sum(int a,int b,int c){
    return a+b+c;
}
int sum(int[] values){
    int result=0;
    for(int x:values){
        result+=x;
    }
    return result;
}
int multiply(int a,int b){
    return a*b;
}
int multiply(int a,int b,int c){
    return a*b*c;
}
int multiply(int[] values){
    int result=1;
    for(int x:values){
        result*=x;
    }
    return result;
}
int max(int a,int b){
    int result=a>=b?a:b;
    return result;
}
int max(int a,int b,int c){
    int[] values={a,b,c};
    int result=a;
    for(int x:values){
        if(x>result){
            result=x;
        }
    }
    return result;
}
int max(int[] values){
    int result=values[0];
    for(int x:values){
        if(x>result){
            result=x;
        }
    }
    return result;
}
int min(int a,int b){
    int result=a<=b?a:b;
    return result;
}
int min(int a,int b,int c){
    int[] values={a,b,c};
    int result=a;
    for(int x:values){
        if(x<result){
            result=x;
        }
    }
    return result;
}
int min(int[] values){
    int result=values[0];
    for(int x:values){
        if(x<result){
            result=x;
        }
    }
    return result;
}
```

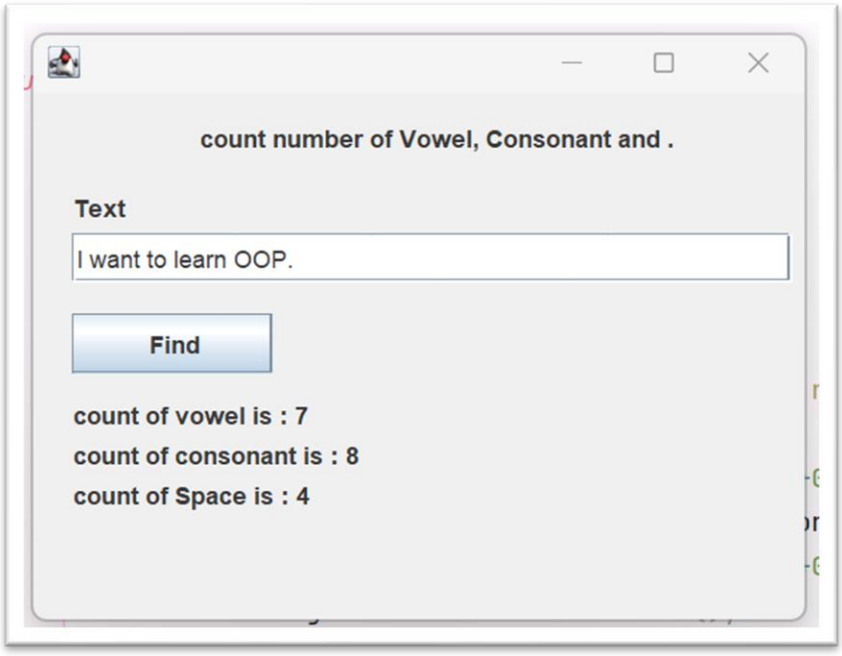
```
    double average(double a,double b){
      return (a+b)/2;
    }
    double average(double a,double b,double c){
        return (a+b+c)/3;
    }
    double average(int[] values){
        double result=0;
        for(double x:values){
            result+=x;
        }
        return result/values.length;
    }
}
public class Lab06_2 {
    static Scanner sc=new Scanner(System.in);
    private static void Menu(){
        math mth=new math();
        System.out.println("==== Menu ===\n" +
                "1. Sum of two values\n" +
                "2. Sum of three values\n" +
                "3. Sum of many values\n" +
                "4. Multiply of two values\n" +
                "5. Multiply of three values\n" +
                "6. Multiply of many values\n" +
                "7. Max of two values\n" +
                "8. Max of three values\n" +
                "9. Max of many values\n" +
                "10. Min of two values\n" +
                "11. Min of three values\n" +
                "12. Min of many values\n" +
                "13. Average of two values\n" +
                "14. Average of three values\n" +
                "15. Average of many values\n" +
                "16. Quit");
        System.out.print("choose: ");
        int opt=sc.nextInt();
        int value1,value2,value3;
        if(opt==1||opt==4||opt==7||opt==10||opt==13){
            System.out.print("Input value-1: ");
            value1=sc.nextInt();
            System.out.print("Input value-2: ");
            value2=sc.nextInt();
            System.out.print("Result = ");
            if(opt==1){
                System.out.println(mth.sum(value1,value2));
            }else if(opt==4){
                System.out.println(mth.multiply(value1,value2));
            }else if(opt==7){
                System.out.println(mth.max(value1,value2));
            }else if(opt==10){
                System.out.println(mth.min(value1,value2));
            }else if(opt==13){
                System.out.println(mth.average(value1,value2));
            }
            Menu();
        }else if(opt==2||opt==5||opt==8||opt==11||opt==14){
            System.out.print("Input value-1: ");
            value1=sc.nextInt();
            System.out.print("Input value-2: ");
            value2=sc.nextInt();
            System.out.print("Input value-3: ");
            value3=sc.nextInt();
            System.out.print("Result = ");
            if(opt==2){
                System.out.println(mth.sum(value1,value2,value3));
            }else if(opt==5){
                System.out.println(mth.multiply(value1,value2,value3));
            }else if(opt==8){
                System.out.println(mth.max(value1,value2,value3));
            }else if(opt==11){
                System.out.println(mth.min(value1,value2,value3));
```

```
            }else if(opt==14){
                System.out.println(mth.average(value1,value2,value3));
            }
            Menu();
        }else if(opt==3||opt==6||opt==9||opt==12||opt==15){
            int x=0;
            int count=1;
            ArrayList<Integer> list=new ArrayList<>();
            do{
                if(count<=2){
                    System.out.print("Input value-"+x+"");
                    x=sc.nextInt();
                    list.add(x);
                }else{
                    System.out.print("Input value-"+x+"(0->stop input): ");
                    x=sc.nextInt();
                    list.add(x);
                }
                count++;
            }while (x!=0);
            int []values = new int[list.size()];
            for(int i=0; i<values.length; i++){
                values[i] = list.get(i);
            }
            System.out.print("Result = ");
            if(opt==3){
                System.out.println(mth.sum(values));
            }else if(opt==6){
                System.out.println(mth.multiply(values));
            }else if(opt==9){
                System.out.println(mth.max(values));
            }else if(opt==12){
                System.out.println(mth.min(values));
            }else if(opt==15){
                System.out.println(mth.average(values));
            }
            Menu();
        }else if(opt==16){
            System.out.println("Quited");
        }else{
            System.out.println("Please input available");
            Menu();
        }

    }

    public static void main(String[] args){
        Menu();
    }
}
```

```
==== Menu ====
1. Sum of two values
2. Sum of three values
3. Sum of many values
4. Multiply of two values
5. Multiply of three values
6. Multiply of many values
7. Max of two values
8. Max of three values
9. Max of many values
10. Min of two values
11. Min of three values
12. Min of many values
13. Average of two values
14. Average of three values
15. Average of many values
16. Quit
choose: 5
Input value-1: 3
Input value-2: 4
Input value-3: 5
Result = 60
```

✓ Lab06.3

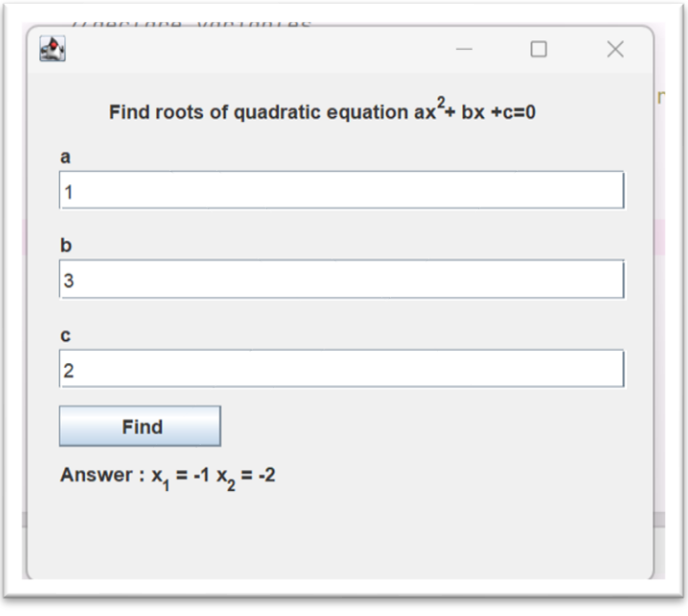
```
import javax.swing.*;
public class Lab06_3 {
    public static void main(String[] args){
        //declare variables
        JFrame frame = new JFrame();
        String numVowel = "count of vowel is : ";
        String numConsonant="count of consonant is : ";
        String numSpace="count of Space is : ";
        JLabel lblHeader = new JLabel(" count number of Vowel, Consonant and Space");
        JLabel lblText = new JLabel("Text");
        JLabel lblVowel = new JLabel(numVowel+0);
        JLabel lblConsonant = new JLabel(numConsonant+0);
        JLabel lblSpace = new JLabel(numSpace+0);
        JTextField jtfText = new JTextField();
        JButton btnFind = new JButton("Find");
        //JFrame
        frame.setSize(400,300);
        frame.setLocationRelativeTo(null);
        frame.setLayout(null);
        frame.setVisible(true);
        //lblHeader
        lblHeader.setBounds(80,10,240,25);
        frame.add(lblHeader);
        //lblText
        lblText.setBounds(20,45,100,25);
        frame.add(lblText);
        //jtfText
        jtfText.setBounds(20,70,360,25);
        frame.add(jtfText);
        //btnFind
        btnFind.setBounds(20,110,100,30);
        frame.add(btnFind);
        btnFind.addActionListener(e->{
            String str=jtfText.getText();
            int countVowel=0;
            int countconsonant=0;
            int countspace=0;
            str=str.toLowerCase();
            for(int i=0;i<str.length();i++) {

if(str.charAt(i)=='i'||str.charAt(i)=='e'||str.charAt(i)=='u'||str.charAt(i)=='o'||str.charAt(i)=='a'
) {
                    countVowel+=1;
                }else if(str.charAt(i)==' ') {
                    countspace+=1;
                }else
if((str.charAt(i)>'a'&&str.charAt(i)<'e')||(str.charAt(i)>'e'&&str.charAt(i)<'i')||(str.charAt(i)>'i'
&&str.charAt(i)<'o')||(str.charAt(i)>'o'&&str.charAt(i)<'u')||(str.charAt(i)>'u'&&str.charAt(i)<='z')
) {
                    countconsonant+=1;
                }
            }
            lblVowel.setText(numVowel+countVowel);
            lblConsonant.setText(numConsonant+countconsonant);
            lblSpace.setText(numSpace+countspace);
        });
        //lblVowel
        lblVowel.setBounds(20,150,300,20);
        frame.add(lblVowel);
        //lblConsonant
        lblConsonant.setBounds(20,170,300,20);
        frame.add(lblConsonant);
        //lblSpace
        lblSpace.setBounds(20,190,300,20);
        frame.add(lblSpace);
    }
}
```



✓ Lab06.4

```
import javax.swing.*;
import java.text.DecimalFormat;
public class Lab06_4 {
    public static void main(String[] args){
        //declare variables
        JFrame frame=new JFrame();
        JLabel lblPurpose=new JLabel("<html>Find roots of quadratic equation ax<sup>2</sup>+ bx
+c=0<html>");
        JLabel lblA=new JLabel("a");
        JLabel lblB=new JLabel("b");
        JLabel lblC=new JLabel("c");
        String answer="Answer : ";
        JLabel lblAnswer = new JLabel(answer);
        JTextField jtfA=new JTextField();
        JTextField jtfB=new JTextField();
        JTextField jtfC=new JTextField();
        JButton btnFind=new JButton("Find");
        //frame
        frame.setSize(400,350);
        frame.setLocationRelativeTo(null);
        frame.setLayout(null);
        frame.setVisible(true);
        //lblPurpose
        lblPurpose.setBounds(50,10,300,20);
        frame.add(lblPurpose);
        //lblA
        lblA.setBounds(20,40,100,20);
        frame.add(lblA);
        //jtfA
        jtfA.setBounds(20,60,350,25);
        frame.add(jtfA);
        //lblB
        lblB.setBounds(20,95,100,20);
        frame.add(lblB);
        //jtfB
        jtfB.setBounds(20,115,350,25);
        frame.add(jtfB);
        //lblC
        lblC.setBounds(20,150,100,20);
        frame.add(lblC);
        //jtfC
        jtfC.setBounds(20,170,350,25);
        frame.add(jtfC);
        //btnFind
```

```
        btnFind.setBounds(20,205,100,25);
        frame.add(btnFind);


        btnFind.addActionListener(e->{
            DecimalFormat decimalFormat = new DecimalFormat("0.00");
            int a=Integer.parseInt(jtfA.getText());
            int b=Integer.parseInt(jtfB.getText());
            int c=Integer.parseInt(jtfC.getText());
            int belta=b*b-4*a*c;
            double rootBelta;
            double x1,x2,x;
            if(belta>0) {
               rootBelta= java.lang.Math.sqrt(belta);
                x1=(-b+rootBelta)/(2*a);
                x2=(-b-rootBelta)/(2*a);
                String strx1,strx2;
                if((int)x1==x1){
                    strx1=(int)x1+"";
                }else{
                    strx1=decimalFormat.format(x1)+"";
                }
                if((int)x2==x2){
                    strx2=(int)x2+"";
                }else{
                    strx2=decimalFormat.format(x2)+"";
                }
                lblAnswer.setText("<html>"+answer+"x<sub>1</sub>"+" = "+strx1+"   x<sub>2</sub>"+" =
"+strx2+"</html>");
            }else if(belta<0) {

                lblAnswer.setText(answer+"Equation roots are complex!");
            }else if(belta==0) {
                x=(-b)/(2*a);
                String strx;
                if((int)x==x){
                    strx=(int)x+"";
                }else{
                    strx=decimalFormat.format(x)+"";
                }
                lblAnswer.setText("<html>"+answer+"x<sub>1</sub> =x<sub>2</sub> = "+strx+"</html>");
            }
        });
        //lblAnswer
        lblAnswer.setBounds(20,240,300,20);
        frame.add(lblAnswer);
    }
}
```



✓ Lab06.5

```
import javax.swing.*;

public class Lab06_5 {
    public static void main(String[] args){
        JFrame frame = new JFrame();
        JLabel lblTitle = new JLabel("Calculator");
        JLabel lblA=new JLabel("A=");
        JLabel lblB=new JLabel("B=");
        JLabel lblSum=new JLabel("= ");
        JLabel lblSub=new JLabel("= ");
        JLabel lblDiv=new JLabel("= ");
        JLabel lblMul=new JLabel("= ");
        JTextField jtfA=new JTextField();
        JTextField jtfB=new JTextField();
        JButton btnSum=new JButton("A+B");
        JButton btnSub=new JButton("A-B");
        JButton btnMul=new JButton("AxB");
        JButton btnDiv=new JButton("A/B");
        //frame
        frame.setSize(300,450);
        frame.setLocationRelativeTo(null);
        frame.setLayout(null);
        frame.setVisible(true);
        //lblTitle
        lblTitle.setBounds(100,20,100,20);
        frame.add(lblTitle);
        //lblA
        lblA.setBounds(20,50,100,20);
        frame.add(lblA);
        //jtfA
        jtfA.setBounds(20,70,250,25);
        frame.add(jtfA);
        //lblB
        lblB.setBounds(20,105,100,20);
        frame.add(lblB);
        //jtfB
        jtfB.setBounds(20,125,250,25);
        frame.add(jtfB);
        //btnSum
        btnSum.setBounds(20,160,100,25);
        frame.add(btnSum);
        btnSum.addActionListener(e->{
            int result = Integer.parseInt(jtfA.getText())+Integer.parseInt(jtfB.getText());
            lblSum.setText("= "+result);
        });
        //lblSum
        lblSum.setBounds(20,190,250,20);
        frame.add(lblSum);
        //btnSub
        btnSub.setBounds(20,220,100,25);
        frame.add(btnSub);
        btnSub.addActionListener(e->{
            int result=Integer.parseInt(jtfA.getText())-Integer.parseInt(jtfB.getText());
            lblSub.setText("= "+result);
        });
        //lblSub
        lblSub.setBounds(20,250,250,20);
        frame.add(lblSub);
        //btnMul
        btnMul.setBounds(20,280,100,25);
        frame.add(btnMul);
        btnMul.addActionListener(e->{
            int result=Integer.parseInt(jtfA.getText())*Integer.parseInt(jtfB.getText());
            lblMul.setText("= "+result);
        });
        //lblMul
        lblMul.setBounds(20,310,250,20);
        frame.add(lblMul);
        //btnDiv
        btnDiv.setBounds(20,340,100,25);
```

```
        frame.add(btnDiv);
        btnDiv.addActionListener(e->{
            float result=(float) Integer.parseInt(jtfA.getText())/Integer.parseInt(jtfB.getText());
            lblDiv.setText("= "+result);
        });
        //lblDiv
        lblDiv.setBounds(20,370,250,20);
        frame.add(lblDiv);

    }
}
```