RAPORT

LA LUCRAREA DE LABORATOR NR. 3

Disciplina : Medii interactive de dezvoltare a produselor soft

TEMA: „GUI Development"

Elaborat de: st.gr.TI-142 Damaschin Ion

Controlat de: Irina Cojanu

1. **Scopul lucrării**

Realizarea unui simplu GUI Calculator.

2. **Obiectivele lucrării**

   a) Realizează un simplu GUI Calculator
   b) Operațiile simple: +,-,*,/,putere, radical, inversare semn(+/-), operații cu numere zecimale
   c) Divizarea proiectului în două module - Interfață grafică(Modul GUI) și Modulul de bază(Core Module)

3. **Efectuarea lucrării de laborator**

   3.1. Task-uri implementate

   - *Basic Level* (nota 5 || 6):

     o Realizează un simplu GUI calculator care suportă funcțiile de bază: +, -, /, *.

   - *Normal Level* (nota 7 || 8):

     o Realizează un simplu GUI calculator care suportă următoarele funcții: +, -, /, *, putere, radical, inversare semn(+/-).

   - *Advanced Level* (nota 9 || 10):

     o Realizează un simplu GUI calculator care suportă următoarele funcții: +, -, /, *, putere, radical, inversare semn(+/-), operații cu numere zecimale.

3.2. Realizarea lucrării de laborator

a) Codul sursă

```java
package CalculatorGUI;


public class calculator extends javax.swing.JFrame {

    String var1;
    String semn;
    String var2;

    public calculator() {
        initComponents();
    }

    @SuppressWarnings("unchecked")
    private void initComponents() {

        txtedit = new javax.swing.JTextField();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jButton5 = new javax.swing.JButton();
        jButton6 = new javax.swing.JButton();
        jButton7 = new javax.swing.JButton();
        jButton8 = new javax.swing.JButton();
        jButton9 = new javax.swing.JButton();
        jButton10 = new javax.swing.JButton();
        jButton11 = new javax.swing.JButton();
        jButton12 = new javax.swing.JButton();
        jButton13 = new javax.swing.JButton();
        jButton14 = new javax.swing.JButton();
        jButton15 = new javax.swing.JButton();
        jButton16 = new javax.swing.JButton();
        jButton17 = new javax.swing.JButton();
        jButton18 = new javax.swing.JButton();
        jButton19 = new javax.swing.JButton();
        jButton20 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        jButton1.setBackground(new java.awt.Color(0, 102, 102));
        jButton1.setForeground(new java.awt.Color(255, 255, 255));
        jButton1.setText("1");
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setBackground(new java.awt.Color(0, 102, 102));
```

```java
    jButton2.setForeground(new java.awt.Color(255, 255, 255));
    jButton2.setText("4");
    jButton2.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButton2ActionPerformed(evt);
        }
    });

    jButton3.setBackground(new java.awt.Color(0, 102, 102));
    jButton3.setForeground(new java.awt.Color(255, 255, 255));
    jButton3.setText("7");
    jButton3.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButton3ActionPerformed(evt);
        }
    });

    jButton4.setBackground(new java.awt.Color(0, 102, 102));
    jButton4.setForeground(new java.awt.Color(255, 255, 255));
    jButton4.setText("0");
    jButton4.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButton4ActionPerformed(evt);
        }
    });

    jButton5.setBackground(new java.awt.Color(0, 102, 102));
    jButton5.setForeground(new java.awt.Color(255, 255, 255));
    jButton5.setText("2");
    jButton5.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButton5ActionPerformed(evt);
        }
    });

    jButton6.setBackground(new java.awt.Color(0, 102, 102));
    jButton6.setForeground(new java.awt.Color(255, 255, 255));
    jButton6.setText("+/-");
    jButton6.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButton6ActionPerformed(evt);
        }
    });

    jButton7.setBackground(new java.awt.Color(0, 102, 102));
    jButton7.setForeground(new java.awt.Color(255, 255, 255));
    jButton7.setText("8");
    jButton7.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButton7ActionPerformed(evt);
        }
    });

    jButton8.setBackground(new java.awt.Color(0, 102, 102));
    jButton8.setForeground(new java.awt.Color(255, 255, 255));
    jButton8.setText("5");
    jButton8.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
```

```java
                jButton8ActionPerformed(evt);
            }
        });

        jButton9.setBackground(new java.awt.Color(0, 102, 102));
        jButton9.setForeground(new java.awt.Color(255, 255, 255));
        jButton9.setText("3");
        jButton9.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton9ActionPerformed(evt);
            }
        });

        jButton10.setBackground(new java.awt.Color(0, 102, 102));
        jButton10.setForeground(new java.awt.Color(255, 255, 255));
        jButton10.setText(".");
        jButton10.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton10ActionPerformed(evt);
            }
        });

        jButton11.setBackground(new java.awt.Color(0, 102, 102));
        jButton11.setForeground(new java.awt.Color(255, 255, 255));
        jButton11.setText("9");
        jButton11.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton11ActionPerformed(evt);
            }
        });

        jButton12.setBackground(new java.awt.Color(0, 102, 102));
        jButton12.setForeground(new java.awt.Color(255, 255, 255));
        jButton12.setText("6");
        jButton12.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton12ActionPerformed(evt);
            }
        });

        jButton13.setBackground(new java.awt.Color(0, 102, 102));
        jButton13.setForeground(new java.awt.Color(255, 255, 255));
        jButton13.setText("-");
        jButton13.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton13ActionPerformed(evt);
            }
        });

        jButton14.setBackground(new java.awt.Color(0, 102, 102));
        jButton14.setForeground(new java.awt.Color(255, 255, 255));
        jButton14.setText("/");
        jButton14.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton14ActionPerformed(evt);
            }
        });
```

```java
        jButton15.setBackground(new java.awt.Color(0, 102, 102));
        jButton15.setForeground(new java.awt.Color(255, 255, 255));
        jButton15.setText("*");
        jButton15.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton15ActionPerformed(evt);
            }
        });

        jButton16.setBackground(new java.awt.Color(0, 102, 102));
        jButton16.setForeground(new java.awt.Color(255, 255, 255));
        jButton16.setText("+");
        jButton16.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton16ActionPerformed(evt);
            }
        });

        jButton17.setBackground(new java.awt.Color(0, 102, 102));
        jButton17.setForeground(new java.awt.Color(255, 255, 255));
        jButton17.setText("CE");
        jButton17.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton17ActionPerformed(evt);
            }
        });

        jButton18.setBackground(new java.awt.Color(0, 102, 102));
        jButton18.setForeground(new java.awt.Color(255, 255, 255));
        jButton18.setText("=");
        jButton18.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton18ActionPerformed(evt);
            }
        });

        jButton19.setBackground(new java.awt.Color(0, 102, 102));
        jButton19.setForeground(new java.awt.Color(255, 255, 255));
        jButton19.setText("в€љ");
        jButton19.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton19ActionPerformed(evt);
            }
        });

        jButton20.setBackground(new java.awt.Color(0, 102, 102));
        jButton20.setForeground(new java.awt.Color(255, 255, 255));
        jButton20.setText("x^2");
        jButton20.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton20ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new
    javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
```

```java
layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)
                        .addGroup(layout.createSequentialGroup()
                            .addGap(34, 34, 34)
                            .addComponent(txtedit,
javax.swing.GroupLayout.PREFERRED_SIZE, 327,
javax.swing.GroupLayout.PREFERRED_SIZE))
                        .addGroup(layout.createSequentialGroup()
                            .addGap(21, 21, 21)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                .addComponent(jButton2,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton1,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton3,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton4,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                .addComponent(jButton8,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton5,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton7,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton6,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                .addComponent(jButton12,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton9,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton11,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton10,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGap(18, 18, 18)
```

```java
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                .addComponent(jButton16,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton13,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton15,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton14,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                .addComponent(jButton20,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton17,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton19,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jButton18,
javax.swing.GroupLayout.PREFERRED_SIZE, 52,
javax.swing.GroupLayout.PREFERRED_SIZE))))
                .addContainerGap(24, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(22, 22, 22)
                .addComponent(txtedit, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButton1,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                        .addComponent(jButton2,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addGap(18, 18, 18)
                        .addComponent(jButton3,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addGap(18, 18, 18)
```

```java
                                        .addComponent(jButton4,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButton5,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                                .addComponent(jButton8,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton7,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton6,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButton9,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                                .addComponent(jButton12,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton11,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton10,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButton13,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                                .addComponent(jButton16,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton15,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton14,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButton17,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
```

```java
                            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                                .addComponent(jButton20,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton19,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGap(18, 18, 18)
                                .addComponent(jButton18,
javax.swing.GroupLayout.PREFERRED_SIZE, 44,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                    .addContainerGap(25, Short.MAX_VALUE))
        );

        pack();
    }

    private void jButton8ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"5");
    }

    private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"8");
    }

    private void jButton13ActionPerformed(java.awt.event.ActionEvent evt) {

        if (!txtedit.getText().equals("")) {
            var1=txtedit.getText();
            semn="-";
            txtedit.setText("");
        }


    }

    private void jButton18ActionPerformed(java.awt.event.ActionEvent evt) {

        String rezulat;
        var2=txtedit.getText();

        if (!var2.equals("")) {
            rezulat=calculator(var1,var2,semn);
            txtedit.setText(rezulat);
        }


    }
public static String calculator(String var1,String var2,String semn){
    Double rezulat=0.0;
    String raspuns;


    if (semn.equals("-")) {
```

```java
            rezulat=Double.parseDouble(var1)-Double.parseDouble(var2);

        }
        if (semn.equals("+")) {
            rezulat=Double.parseDouble(var1)+Double.parseDouble(var2);

        }
        if (semn.equals("*")) {
            rezulat=Double.parseDouble(var1)*Double.parseDouble(var2);

        }
        if (semn.equals("/")) {
            rezulat=Double.parseDouble(var1)/Double.parseDouble(var2);

        }

        raspuns=rezulat.toString();
        return raspuns;
    }



    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"1");
    }

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"2");
    }

    private void jButton9ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"3");
    }

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"4");
    }

    private void jButton12ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"6");
    }

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"7");
    }

    private void jButton11ActionPerformed(java.awt.event.ActionEvent evt) {

        txtedit.setText(txtedit.getText()+"9");
    }
```

```java
private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {

    txtedit.setText(txtedit.getText()+"0");
}

private void jButton10ActionPerformed(java.awt.event.ActionEvent evt) {

    String k;
    k=txtedit.getText();

    if (k.length()<=0) {
        txtedit.setText("0.");

    }
    else{
        if (!dot(txtedit.getText())) {
            txtedit.setText(txtedit.getText()+".");

        }
    }

}

private void jButton17ActionPerformed(java.awt.event.ActionEvent evt) {

  txtedit.setText("");
}

private void jButton20ActionPerformed(java.awt.event.ActionEvent evt) {
    String k;
    double num;
    k=txtedit.getText();

    if (k.length()>0) {
        num = Double.parseDouble(k)*Double.parseDouble(k);
        txtedit.setText(String.valueOf(num));
    }
}

private void jButton19ActionPerformed(java.awt.event.ActionEvent evt) {

    String k;
    double num;
    k=txtedit.getText();
    if (k.length()>0) {
        num=Math.sqrt(Double.parseDouble(k));
        txtedit.setText(String.valueOf(num));


    }
}

private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {

    Double num;
    String k;
    k=txtedit.getText();
    if (k.length()>0) {
```

```java
            num=(-1)*Double.parseDouble(k);
            txtedit.setText(num.toString());
        }
    }

    private void jButton16ActionPerformed(java.awt.event.ActionEvent evt) {

        if (!txtedit.getText().equals("")) {
            var1=txtedit.getText();
            semn="+";
            txtedit.setText("");
        }
    }

    private void jButton15ActionPerformed(java.awt.event.ActionEvent evt) {

        if (!txtedit.getText().equals("")) {
            var1=txtedit.getText();
            semn="*";
            txtedit.setText("");
        }
    }

    private void jButton14ActionPerformed(java.awt.event.ActionEvent evt) {

        if (!txtedit.getText().equals("")) {
            var1=txtedit.getText();
            semn="/";
            txtedit.setText("");
        }
    }


    public static boolean dot(String k){
        boolean rezulat;
        rezulat=false;

        for (int i = 0; i < k.length(); i++) {
            if (k.substring(i, i+1).equals(".")) {
                rezulat=true;
                break;



            }

        }
        return rezulat;


    }

    public static void main(String args[]) {

        try {
            for (javax.swing.UIManager.LookAndFeelInfo info :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Nimbus".equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
```

12

```java
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(calculator.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(calculator.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(calculator.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(calculator.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        }


        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new calculator().setVisible(true);
            }
        });
    }

    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton10;
    private javax.swing.JButton jButton11;
    private javax.swing.JButton jButton12;
    private javax.swing.JButton jButton13;
    private javax.swing.JButton jButton14;
    private javax.swing.JButton jButton15;
    private javax.swing.JButton jButton16;
    private javax.swing.JButton jButton17;
    private javax.swing.JButton jButton18;
    private javax.swing.JButton jButton19;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton20;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JButton jButton6;
    private javax.swing.JButton jButton7;
    private javax.swing.JButton jButton8;
    private javax.swing.JButton jButton9;
    private javax.swing.JTextField txtedit;

}
```
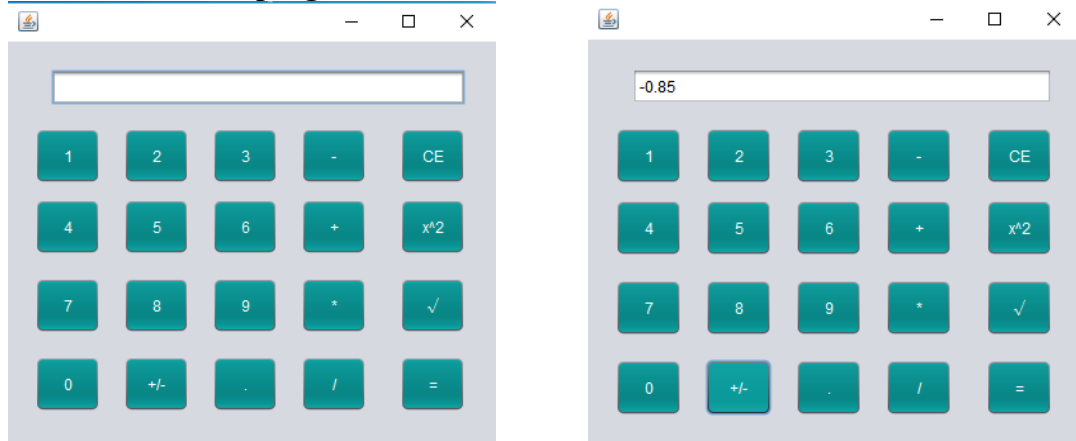
b) Rezultatul rulării programului

Concluzie

În urma realizării laboratorului nr.3 la tema: *"GUI Development"*, am însuşit utilizarea NetBeans, cît şi limbajul de programare JAVA.

Acesta include operaţii simple ca: +, -, *, /, putere, radical, inversare semn(+/-), operaţii cu numere zecimale.

Java este un limbaj foarte dinamic şi puternic.Am ales acest limbaj pentru realizarea lucrării deoarece consider că sarcina a fost mai uşor de implementat în JAVA decît în C++ ,sau C# etc.

NetBeans ca IDE este unul complex şi relativ uşor de învăţat.Redactorul de forme este foarte util.

Micile dificultăţi întîlnite au fost uşor soluţionate cu ajutorul materialelor video din internet,si documentaţiei oficiale.

Bibliografie

1. https://netbeans.org/kb/index.html
2. http://www.homeandlearn.co.uk/java/java_events.html