Пензенский государственный университет

Кафедра «Вычислительная техника»

**ОТЧЕТ**

по лабораторной работе №2

по курсу «Разработка кроссплатформенных приложений»

на тему: «Работа с коллекциями объектов»

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Пенза 2024

**Цель работы:** изучить библиотеку стандартных коллекций Java Collections Framework, позволяющую хранить различные структуры данных.

**Ход работы:**

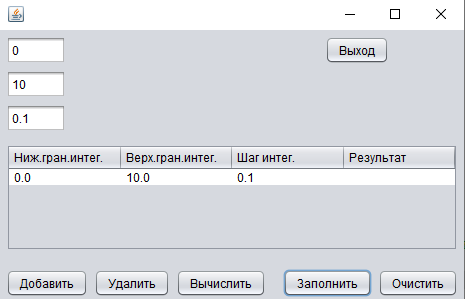


Рисунок 1- Реализация кнопки "Заполнить"

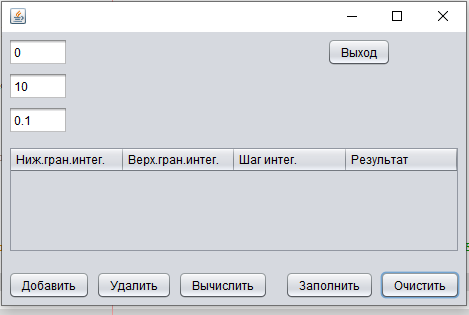


Рисунок 2- Реализация кнопки "Очистить"

**Результат работы программы:**

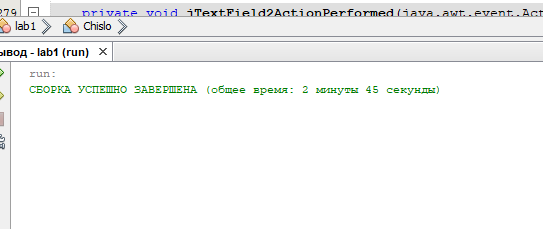


Рисунок 3- Результат

Листинг программы:

/\*

\* To change this license header, choose License Headers in Project Properties.

\* To change this template file, choose Tools | Templates

\* and open the template in the editor.

\*/

import javax.swing.table.DefaultTableModel;

import javax.swing.JOptionPane;

import java.util.ArrayList;

import java.util.logging.Level;

import java.util.logging.Logger;

/\*\*

\*

\* @author maxwe

\*/

public class lab1 extends javax.swing.JFrame {

/\*\*

\* Creates new form lab1

\*/

public lab1() {

initComponents();

}

/\*\*

\* This method is called from within the constructor to initialize the form.

\* WARNING: Do NOT modify this code. The content of this method is always

\* regenerated by the Form Editor.

\*/

@SuppressWarnings("unchecked")

// <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents

private void initComponents() {

jTextField1 = new javax.swing.JTextField();

jTextField2 = new javax.swing.JTextField();

jTextField3 = new javax.swing.JTextField();

jScrollPane1 = new javax.swing.JScrollPane();

jTable1 = new javax.swing.JTable();

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();

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT\_ON\_CLOSE);

jTextField1.setText("Ниж");

jTextField1.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jTextField1ActionPerformed(evt);

}

});

jTextField2.setText("Верх");

jTextField2.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jTextField2ActionPerformed(evt);

}

});

jTextField3.setText("Шаг");

jTextField3.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jTextField3ActionPerformed(evt);

}

});

jTable1.setModel(new javax.swing.table.DefaultTableModel(

new Object [][] {

{null, null, null, null},

{null, null, null, null},

{null, null, null, null},

{null, null, null, null},

{null, null, null, null}

},

new String [] {

"Ниж.гран.интег.", "Верх.гран.интег.", "Шаг интег.", "Результат"

}

) {

boolean[] canEdit = new boolean [] {

false, false, false, false

};

public boolean isCellEditable(int rowIndex, int columnIndex) {

return canEdit [columnIndex];

}

});

jScrollPane1.setViewportView(jTable1);

jButton1.setText("Добавить");

jButton1.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButton1ActionPerformed(evt);

}

});

jButton2.setText("Удалить");

jButton2.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButton2ActionPerformed(evt);

}

});

jButton3.setText("Вычислить");

jButton3.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButton3ActionPerformed(evt);

}

});

jButton4.setText("Выход");

jButton4.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButton4ActionPerformed(evt);

}

});

jButton5.setText("Заполнить");

jButton5.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButton5ActionPerformed(evt);

}

});

jButton6.setText("Очистить");

jButton6.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButton6ActionPerformed(evt);

}

});

javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());

getContentPane().setLayout(layout);

layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addContainerGap()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addComponent(jButton1)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addComponent(jButton2)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addComponent(jButton3)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)

.addComponent(jButton5)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addComponent(jButton6))

.addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED\_SIZE, 452, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING, false)

.addComponent(jTextField1)

.addComponent(jTextField2, javax.swing.GroupLayout.DEFAULT\_SIZE, 60, Short.MAX\_VALUE)

.addComponent(jTextField3))

.addGap(259, 259, 259)

.addComponent(jButton4)))

.addGap(0, 0, Short.MAX\_VALUE)))

.addContainerGap())

);

layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addContainerGap()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

.addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(jButton4))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addComponent(jTextField2, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addComponent(jTextField3, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

.addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED\_SIZE, 107, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

.addComponent(jButton1)

.addComponent(jButton2)

.addComponent(jButton3)

.addComponent(jButton6)

.addComponent(jButton5))

.addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))

);

pack();

}// </editor-fold>//GEN-END:initComponents

public class InvalidRecIntegralValueException extends Exception {

public InvalidRecIntegralValueException(double value) {

super("Invalid value: " + value + ". Value must be a number in the range from 0.000001 to 1000000.");

}

}

public class Chislo {

private double lowerBound;

private double upperBound;

private double step;

public Chislo() {

// Конструктор по умолчанию

}

public Chislo(double lowerBound, double upperBound, double step) {

this.lowerBound = lowerBound;

this.upperBound = upperBound;

this.step = step;

}

public void setLowerBound(double lowerBound) {

this.lowerBound = lowerBound;

}

public void setUpperBound(double upperBound) {

this.upperBound = upperBound;

}

public void setStep(double step) {

this.step = step;

}

@Override

public String toString() {

return "Chislo [lowerBound=" + lowerBound + ", upperBound=" + upperBound + ", step=" + step + "]";

}

}

private ArrayList<Chislo> RecIntegral = new ArrayList<>();

private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jButton1ActionPerformed

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

double lowerBound = Double.parseDouble(jTextField1.getText());

double upperBound = Double.parseDouble(jTextField2.getText());

double step = Double.parseDouble(jTextField3.getText());

Chislo chislo = new Chislo();

chislo.setLowerBound(lowerBound);

chislo.setUpperBound(upperBound);

chislo.setStep(step);

Object[] rowData = {lowerBound, upperBound, step, ""}; // Данные для добавления в таблицу

// Вставить данные в первую строку таблицы

model.insertRow(0, rowData);

// Добавление объекта Chislo в коллекцию на первую позицию

RecIntegral.add(0, chislo);

}//GEN-LAST:event\_jButton1ActionPerformed

private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jButton4ActionPerformed

// TODO add your handling code here:

System.exit(0);

}//GEN-LAST:event\_jButton4ActionPerformed

private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jButton2ActionPerformed

// TODO add your handling code here:

//Chislo chislo = new Chislo();

//ArrayList<Chislo> RecIntegral = new Chislo().ListChislo(); // Получаем коллекцию объектов Chislo

// Получаем индекс выбранной строки и столбца

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

int selectedRow = jTable1.getSelectedRow();

// Проверяем, что выбранная ячейка не пуста

if (selectedRow != -1) {

// Устанавливаем значение выбранной ячейки как null или пустую строку

model.removeRow(selectedRow);

RecIntegral.remove(selectedRow);

} else {

// Если ячейка не выбрана, выводим сообщение об ошибке

JOptionPane.showMessageDialog(this, "Пожалуйста, выберите ячейку для удаления значения.", "Ошибка", JOptionPane.ERROR\_MESSAGE);

}

}//GEN-LAST:event\_jButton2ActionPerformed

private void jTextField1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jTextField1ActionPerformed

// TODO add your handling code here:

}//GEN-LAST:event\_jTextField1ActionPerformed

private void jTextField2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jTextField2ActionPerformed

// TODO add your handling code here:

}//GEN-LAST:event\_jTextField2ActionPerformed

private void jTextField3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jTextField3ActionPerformed

// TODO add your handling code here:

}//GEN-LAST:event\_jTextField3ActionPerformed

private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jButton3ActionPerformed

// TODO add your handling code here:

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

int row = 0; // использовать первую строку таблицы

double lowerBound = Double.parseDouble(model.getValueAt(row, 0).toString());

double upperBound = Double.parseDouble(model.getValueAt(row, 1).toString());

double step = Double.parseDouble(model.getValueAt(row, 2).toString());

double i = 0;

double result = 0;

for(i = lowerBound; i < upperBound; i+=step){

if((i + step) < upperBound) {

result += ((1/i) + (1/(step + i))) \* (step/2);

}

else{

result += ((1/i) + (1/upperBound)) \* ((upperBound - i)/2);

lowerBound = lowerBound + step;

}

}

model.setValueAt(result, row, 3); // Устанавливаем значение результата в четвертый столбец таблицы

}//GEN-LAST:event\_jButton3ActionPerformed

private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jButton5ActionPerformed

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

for (Chislo chislo : RecIntegral) {

Object[] rowData = {chislo.lowerBound, chislo.upperBound, chislo.step, ""};

model.addRow(rowData); // Добавление данных в таблицу

}

}//GEN-LAST:event\_jButton5ActionPerformed

private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_jButton6ActionPerformed

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

model.setRowCount(0); // Очистка таблицы

}//GEN-LAST:event\_jButton6ActionPerformed

/\*\*

\* @param args the command line arguments

\*/

public static void main(String args[]) {

/\* Set the Nimbus look and feel \*/

//<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">

/\* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.

\* For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html

\*/

try {

for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {

if ("Nimbus".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());

break;

}

}

} catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(lab1.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(lab1.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(lab1.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(lab1.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

}

//</editor-fold>

/\* Create and display the form \*/

java.awt.EventQueue.invokeLater(new Runnable() {

public void run() {

new lab1().setVisible(true);

}

});

}

// Variables declaration - do not modify//GEN-BEGIN:variables

private javax.swing.JButton jButton1;

private javax.swing.JButton jButton2;

private javax.swing.JButton jButton3;

private javax.swing.JButton jButton4;

private javax.swing.JButton jButton5;

private javax.swing.JButton jButton6;

private javax.swing.JScrollPane jScrollPane1;

private javax.swing.JTable jTable1;

private javax.swing.JTextField jTextField1;

private javax.swing.JTextField jTextField2;

private javax.swing.JTextField jTextField3;

// End of variables declaration//GEN-END:variables

}S