Министерство образования Российской Федерации

Пензенский государственный университет

Кафедра «Вычислительная техника»

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ОТЧЕТ

по лабораторной работе №2

по курсу «Программирование на языке Java»

на тему «Работа с коллекциями объектов»

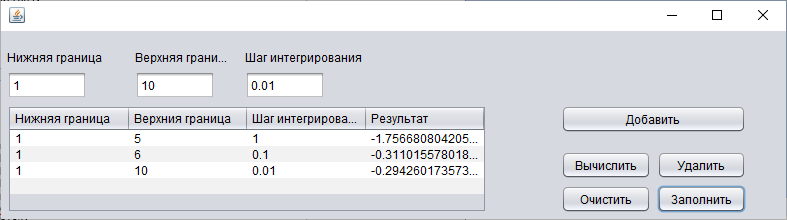
**Цель работы**:

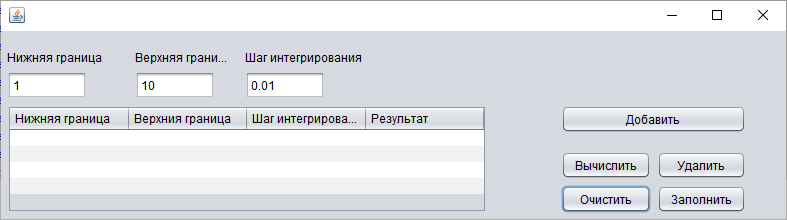
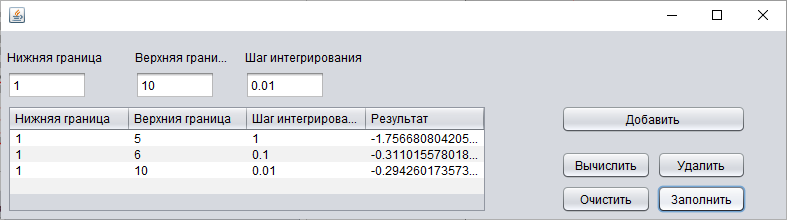
изучить библиотеку стандартных коллекций Java Collections Framework, позволяющую хранить различные структуры данных.

**Задание на лабораторную работу**:

модифицировать приложение из предыдущей лабораторной работы, реализовав хранение данных таблицы с использованием библиотеки коллекций. Для этого реализовать класс RecIntegral, способный хранить одну запись таблицы. Для нечетных вариантов в качестве класса-коллекции выбрать ArrayList, для четных - LinkedList. Кроме того, добавить пару кнопок: очистить / заполнить, которые будут очищать таблицу и заполнять ее данными из коллекции соответственно. Оформление лабораторной работы должно быть выполнено в соответствии с требованиями, приведенными в Приложении 2.

**Результат работы программы:**





**Вывод:** Мы изучили библиотеку стандартных коллекций Java Collections Framework, позволяющую хранить различные структуры данных.

Листинг:

/\*

\* 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.

\*/

package my.numberaddition;

import java.util.ArrayList;

import java.util.List;

/\*\*

\*

\* @author student

\*/

public class ContactEditorUI extends javax.swing.JFrame {

/\*\*

\* Creates new form ContactEditorUI

\*/

public ContactEditorUI() {

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">

private void initComponents() {

jPanel1 = new javax.swing.JPanel();

jTextField1 = new javax.swing.JTextField();

jTextField2 = new javax.swing.JTextField();

jTextField3 = new javax.swing.JTextField();

jLabel1 = new javax.swing.JLabel();

jLabel2 = new javax.swing.JLabel();

jLabel3 = new javax.swing.JLabel();

jScrollPane2 = new javax.swing.JScrollPane();

jTable2 = 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();

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

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

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

jTextField1ActionPerformed(evt);

}

});

jLabel1.setText("Нижняя граница");

jLabel2.setText("Верхняя граница");

jLabel3.setText("Шаг интегрирования");

jTable2.setModel(new javax.swing.table.DefaultTableModel(

new Object [][] {

{null, null, null, null},

{null, null, null, null},

{null, null, null, null},

{null, null, null, null}

},

new String [] {

"Нижняя граница", "Верхния граница", "Шаг интегрироваиня", "Результат"

}

) {

boolean[] canEdit = new boolean [] {

true, true, true, false

};

public boolean isCellEditable(int rowIndex, int columnIndex) {

return canEdit [columnIndex];

}

});

jScrollPane2.setViewportView(jTable2);

jButton1.setText("Добавить");

jButton1.setActionCommand("jButton");

jButton1.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButton1MouseClicked(evt);

}

});

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

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

jButton1ActionPerformed(evt);

}

});

jButton2.setText("Удалить");

jButton2.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButton2MouseClicked(evt);

}

});

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

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

jButton2ActionPerformed(evt);

}

});

jButton3.setText("Вычислить");

jButton3.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButton3MouseClicked(evt);

}

});

jButton4.setText("Очистить");

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);

}

});

javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);

jPanel1.setLayout(jPanel1Layout);

jPanel1Layout.setHorizontalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(jPanel1Layout.createSequentialGroup()

.addContainerGap()

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(jPanel1Layout.createSequentialGroup()

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jLabel1)

.addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED\_SIZE, 80, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGap(33, 33, 33)

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jLabel2, javax.swing.GroupLayout.PREFERRED\_SIZE, 92, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(jTextField2, javax.swing.GroupLayout.PREFERRED\_SIZE, 80, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGap(18, 18, 18)

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jLabel3)

.addComponent(jTextField3, javax.swing.GroupLayout.PREFERRED\_SIZE, 80, javax.swing.GroupLayout.PREFERRED\_SIZE)))

.addGroup(jPanel1Layout.createSequentialGroup()

.addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED\_SIZE, 480, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addGap(74, 74, 74)

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jButton1, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)

.addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)

.addComponent(jButton4, javax.swing.GroupLayout.Alignment.LEADING, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)

.addComponent(jButton3, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))

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

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)

.addComponent(jButton2, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)

.addComponent(jButton5, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))))))

.addGap(40, 40, 40))

);

jPanel1Layout.setVerticalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(jPanel1Layout.createSequentialGroup()

.addGap(12, 12, 12)

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

.addComponent(jLabel2)

.addComponent(jLabel3)

.addComponent(jLabel1, javax.swing.GroupLayout.PREFERRED\_SIZE, 15, javax.swing.GroupLayout.PREFERRED\_SIZE))

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

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jTextField3, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT\_SIZE, 27, Short.MAX\_VALUE)

.addComponent(jTextField2)

.addComponent(jTextField1))

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

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(jPanel1Layout.createSequentialGroup()

.addComponent(jButton1)

.addGap(18, 18, 18)

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

.addComponent(jButton2)

.addComponent(jButton3))

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

.addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

.addComponent(jButton4)

.addComponent(jButton5)))

.addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED\_SIZE, 108, javax.swing.GroupLayout.PREFERRED\_SIZE)))

);

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

getContentPane().setLayout(layout);

layout.setHorizontalGroup(

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

.addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()

.addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)

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

);

layout.setVerticalGroup(

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

.addGroup(layout.createSequentialGroup()

.addContainerGap()

.addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)

.addContainerGap())

);

pack();

}// </editor-fold>

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

// TODO add your handling code here:

}

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

// TODO add your handling code here:

}

private void jTextField1ActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jButton1MouseClicked(java.awt.event.MouseEvent evt) {

String bottom = (String)jTextField1.getText();

String high= jTextField2.getText();

String step= jTextField3.getText();

for(int i = 0; ; i++)

{

if (jTable2.getValueAt(i, 1)==null){

jTable2.setValueAt(bottom, i, 0);

jTable2.setValueAt(high,i, 1);

jTable2.setValueAt(step,i, 2);

break;

}

if(i == 3)

{

break;

}

}

}

private void jButton2MouseClicked(java.awt.event.MouseEvent evt) {

jTable2.setValueAt(null, jTable2.getSelectedRow(), 0);

jTable2.setValueAt(null,jTable2.getSelectedRow(), 1);

jTable2.setValueAt(null,jTable2.getSelectedRow(), 2);

jTable2.setValueAt(null,jTable2.getSelectedRow(), 3);

}

private void jButton3MouseClicked(java.awt.event.MouseEvent evt) {

for(int i = 0; ; i++)

{

RecIntegral RecIntCapacitor = new RecIntegral();

if (jTable2.getValueAt(i, 1)!=null)

{

RecIntCapacitor.SetBottom((String)jTable2.getValueAt(i, 0));

RecIntCapacitor.SetHigh((String)jTable2.getValueAt(i, 1));

RecIntCapacitor.SetStep((String)jTable2.getValueAt(i, 2));

double temp;

double tempBottom = RecIntCapacitor.GetdwBottom();

double tempStep = RecIntCapacitor.GetdwStep();

double tempResult = 0.0;

while (tempBottom < RecIntCapacitor.GetdwHigh())

{

temp = 0.0;

temp = Math.cos(Math.pow(tempBottom, 2))/2;

tempBottom += tempStep;

temp += Math.cos(Math.pow(tempBottom, 2))/2;

tempResult += temp \* tempStep;

}

jTable2.setValueAt(tempResult,i, 3);

RecIntCapacitor.SetResult(tempResult);

Array.add(RecIntCapacitor);

tempResult = 0.0;

continue;

}

if(i == 3)

{

break;

}

}

}

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

for(int i = 0; i < jTable2.getRowCount(); i++)

{

jTable2.setValueAt(null, i, 0);

jTable2.setValueAt(null,i, 1);

jTable2.setValueAt(null,i, 2);

jTable2.setValueAt(null,i, 3);

}

}

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

for (int i = 0; i < Array.size(); i++)

{

jTable2.setValueAt(Array.get(i).GetBottom(), i, 0);

jTable2.setValueAt(Array.get(i).GetHigh(),i, 1);

jTable2.setValueAt(Array.get(i).GetStep(),i, 2);

jTable2.setValueAt(Array.get(i).GetResult(),i, 3);

}

}

ArrayList <RecIntegral> Array = new ArrayList <RecIntegral>();

/\*\*

\* @param args the command line arguments

\*/

public class RecIntegral

{

// ArrayList <RecIntegral> Array = new ArrayList <RecIntegral>();

//private int ArrayCount = 0;

private String bottom;

private Double dwBottom;

private String high;

private Double dwHigh;

private String step;

private Double dwStep;

private String result;

private Double dwResult;

public RecIntegral()

{

bottom = "";

dwBottom = 0.0;

high = "";

dwHigh = 0.0;

step = "";

dwStep = 0.0;

result = "";

dwResult = 0.0;

}

public void SetBottom(String bottom)

{

this.bottom = bottom;

this.dwBottom = Double.parseDouble(bottom);

}

public void SetBottom(Double dwBottom)

{

this.dwBottom = dwBottom;

this.bottom = dwBottom.toString();

}

public void SetHigh(String high)

{

this.high = high;

this.dwHigh = Double.parseDouble(high);

}

public void SetHigh(Double dwHigh)

{

this.dwHigh = dwHigh;

this.high = dwHigh.toString();

}

public void SetStep(String step)

{

this.step = step;

this.dwStep = Double.parseDouble(step);

}

public void SetStep(Double dwStep)

{

this.dwStep = dwStep;

this.step = dwStep.toString();

}

public void SetResult(String result)

{

this.result = result;

this.dwResult = Double.parseDouble(result);

}

public void SetResult(Double dwResult)

{

this.dwResult = dwResult;

this.result = dwResult.toString();

}

public String GetBottom()

{

return this.bottom;

}

public Double GetdwBottom()

{

return this.dwBottom;

}

public String GetHigh()

{

return this.high;

}

public Double GetdwHigh()

{

return this.dwHigh;

}

public String GetStep()

{

return this.step;

}

public Double GetdwStep()

{

return this.dwStep;

}

public String GetResult()

{

return this.result;

}

public Double GetdwResult()

{

return this.dwResult;

}

}

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(ContactEditorUI.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (InstantiationException ex) {

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

} catch (IllegalAccessException ex) {

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

} catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(ContactEditorUI.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 ContactEditorUI().setVisible(true);

}

});

}

// Variables declaration - do not modify

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.JLabel jLabel1;

private javax.swing.JLabel jLabel2;

private javax.swing.JLabel jLabel3;

private javax.swing.JPanel jPanel1;

private javax.swing.JScrollPane jScrollPane2;

private javax.swing.JTable jTable2;

private javax.swing.JTextField jTextField1;

private javax.swing.JTextField jTextField2;

private javax.swing.JTextField jTextField3;

// End of variables declaration

}