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ОТЧЕТ

по лабораторной работе №2

по курсу «Программирование на языке Java»

на тему «Работа с коллекциями объектов»

Министерство образования Российской Федерации

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**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. Класса-коллекции выбрать LinkedList. Кроме того, добавить пару кнопок: очистить / заполнить, которые будут очищать таблицу и заполнять ее данными из коллекции соответственно.

Листинг:

RecIntegral.java:

package Var8;

import java.util.\*;

public class RecIntegral {

private String lowerIntegral;

private String upperIntegral;

private String integralStep;

private String integralResult;

public RecIntegral(String lowerIntegral, String upperIntegral,String integralStep){

this.lowerIntegral = lowerIntegral;

this.upperIntegral = upperIntegral;

this.integralStep = integralStep;

this.integralResult = "0";

}

public RecIntegral(String lowerIntegral, String upperIntegral,String integralStep,String integralResult){

this.lowerIntegral = lowerIntegral;

this.upperIntegral = upperIntegral;

this.integralStep = integralStep;

this.integralResult = integralResult;

}

public void setResult(String integralResult){

this.integralResult = integralResult;

}

public String getLowerIntegral(){

return this.lowerIntegral;

}

public String getUpperIntegral(){

return this.upperIntegral;

}

public String getIntegralStep(){

return this.integralStep;

}

public String getIntegralResult(){

return this.integralResult;

}

public double calculateIntegral(){

double l = Double.valueOf(this.lowerIntegral);

double h = Double.valueOf(this.upperIntegral);

double s = Double.valueOf(this.integralStep);

double n = (h-l)/s;

double result = 0;

for(int i=1; i<n-1; i++){

double index = l+i\*s;

result += (Math.sin(Math.pow(index, 2)));

}

result += (Math.sin(Math.pow(l, 2)) + Math.sin(Math.pow(h, 2)))/2;

result = s\*result;

this.integralResult = Double.toString(result);

return result;

}

}

JFrame.java:

package Var8;

import java.util.\*;

import javax.swing.table.DefaultTableModel;

public class JFrame extends javax.swing.JFrame {

/\*\*

\* Creates new form JFrame

\*/

public JFrame() {

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() {

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();

label1 = new java.awt.Label();

label2 = new java.awt.Label();

label3 = new java.awt.Label();

jButton5 = new javax.swing.JButton();

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

jTextField1.setText("0");

jTextField2.setText("0");

jTextField3.setText("0");

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

new Object [][] {

},

new String [] {

"Lower", "Upper", "Step", "Result"

}

));

jScrollPane1.setViewportView(jTable1);

jButton1.setText("Add");

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

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

jButton1ActionPerformed(evt);

}

});

jButton2.setText("Delete");

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

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

jButton2ActionPerformed(evt);

}

});

jButton3.setText("Calculate");

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

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

jButton3ActionPerformed(evt);

}

});

jButton4.setText("Load list");

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

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

jButton4ActionPerformed(evt);

}

});

label1.setText("Step:");

label2.setText("Lower:");

label3.setText("Upper:");

jButton5.setText("Clear");

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

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

jButton5ActionPerformed(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()

.addGap(33, 33, 33)

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

.addGroup(layout.createSequentialGroup()

.addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED\_SIZE, 498, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addGap(18, 18, 18)

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

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

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

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

.addComponent(jButton4, 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)))

.addGroup(layout.createSequentialGroup()

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

.addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED\_SIZE, 90, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(label2, 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)

.addComponent(jTextField2, javax.swing.GroupLayout.PREFERRED\_SIZE, 90, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(label3, 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)

.addComponent(label1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(jTextField3, javax.swing.GroupLayout.PREFERRED\_SIZE, 90, javax.swing.GroupLayout.PREFERRED\_SIZE))))

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

);

layout.setVerticalGroup(

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

.addGroup(layout.createSequentialGroup()

.addContainerGap()

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

.addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED\_SIZE, 257, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addGroup(layout.createSequentialGroup()

.addComponent(jButton1)

.addGap(18, 18, 18)

.addComponent(jButton2)

.addGap(18, 18, 18)

.addComponent(jButton3)

.addGap(18, 18, 18)

.addComponent(jButton4)

.addGap(18, 18, 18)

.addComponent(jButton5)))

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

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

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

.addComponent(label2, javax.swing.GroupLayout.Alignment.LEADING, javax.swing.GroupLayout.DEFAULT\_SIZE, 22, Short.MAX\_VALUE)

.addComponent(label3, javax.swing.GroupLayout.Alignment.LEADING, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))

.addComponent(label1, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.PREFERRED\_SIZE, 20, javax.swing.GroupLayout.PREFERRED\_SIZE))

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

.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(jTextField2)

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

.addContainerGap(26, Short.MAX\_VALUE))

);

pack();

}// </editor-fold>

LinkedList<RecIntegral> recIntegral = new LinkedList<>();

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

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

recIntegral.add(0,new RecIntegral(jTextField1.getText(),jTextField2.getText(),jTextField3.getText()));

dt.insertRow(0,new Object[]{jTextField1.getText(),jTextField2.getText(),jTextField3.getText(),0});

}

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

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

int row = jTable1.getSelectedRow();

if(row != -1){

dt.removeRow(jTable1.getSelectedRow());

recIntegral.remove(row);

}

}

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

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

int row = jTable1.getSelectedRow();

if(row != -1){

dt.setValueAt(recIntegral.get(row).calculateIntegral(), row, 3);

}

}

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

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

dt.setRowCount(0);

for (RecIntegral recInt : recIntegral)

{

dt.addRow(new Object[]{recInt.getLowerIntegral(), recInt.getUpperIntegral(), recInt.getIntegralStep(), recInt.getIntegralResult()});

}

}

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

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

dt.setRowCount(0);

}

/\*\*

\* @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(JFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (InstantiationException ex) {

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

} catch (IllegalAccessException ex) {

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

} catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(JFrame.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 JFrame().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.JScrollPane jScrollPane1;

private javax.swing.JTable jTable1;

private javax.swing.JTextField jTextField1;

private javax.swing.JTextField jTextField2;

private javax.swing.JTextField jTextField3;

private java.awt.Label label1;

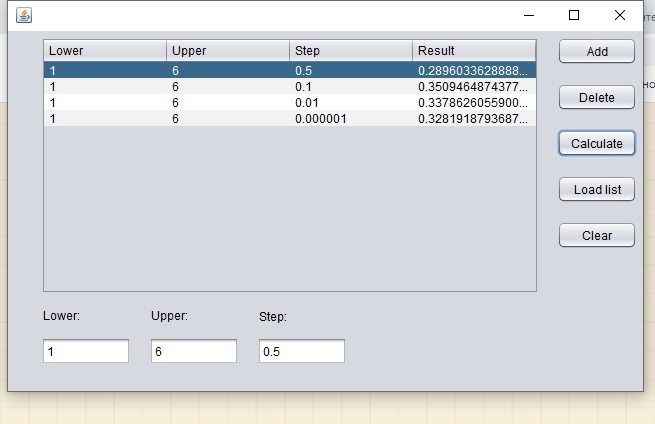
private java.awt.Label label2;

private java.awt.Label label3;

// End of variables declaration

}

Результат работы:



Вывод:

В ходе лабораторной работы изучили библиотеку стандартных коллекций Java Collections Framework, позволяющую хранить различные структуры данных.