**LAPORAN TUGAS**

**ASISTENSI ALGORITMA PEMROGRAMAN**

***“Aproksimasi nilai f(x) dengan n angka penting”***



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**SURABAYA**

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1. **SOAL**

Input : a, n, x

Output :

Nilai f(x) soal nomor 4, 3, dan 5

1. **SOURCE CODE**

|  |
| --- |
| /\* |
|  | \* 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. |
|  | \*/ |
|  |  |
|  | /\*\* |
|  | \* |
|  | \* @author ASUS |
|  | \*/ |
|  | public class guii extends javax.swing.JFrame { |
|  |  |
|  |  |
|  |  |
|  | /\*\* |
|  | \* Creates new form guii |
|  | \*/ |
|  | public guii() { |
|  | 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() { |
|  |  |
|  | boxsoal = new javax.swing.JComboBox<>(); |
|  | jLabel1 = new javax.swing.JLabel(); |
|  | inputx = new javax.swing.JTextField(); |
|  | jLabel2 = new javax.swing.JLabel(); |
|  | inputa = new javax.swing.JTextField(); |
|  | jLabel3 = new javax.swing.JLabel(); |
|  | inputn = new javax.swing.JTextField(); |
|  | jLabel4 = new javax.swing.JLabel(); |
|  | nilaifx = new javax.swing.JTextField(); |
|  | tombolhitung = new javax.swing.JButton(); |
|  | tombolreset = new javax.swing.JButton(); |
|  | jScrollPane1 = new javax.swing.JScrollPane(); |
|  | jTextArea1 = new javax.swing.JTextArea(); |
|  | labelsoal = new javax.swing.JLabel(); |
|  | labelsyarat = new javax.swing.JLabel(); |
|  |  |
|  | setDefaultCloseOperation(javax.swing.WindowConstants.EXIT\_ON\_CLOSE); |
|  |  |
|  | boxsoal.setModel(new javax.swing.DefaultComboBoxModel<>(new String[] { "Pilih Soal", "Soal 1", "Soal 2", "Soal 3" })); |
|  | boxsoal.addActionListener(new java.awt.event.ActionListener() { |
|  | public void actionPerformed(java.awt.event.ActionEvent evt) { |
|  | pilihsoal(evt); |
|  | } |
|  | }); |
|  |  |
|  | jLabel1.setText("Masukkan nilai x"); |
|  |  |
|  | jLabel2.setText("Masukkan nilai a"); |
|  |  |
|  | jLabel3.setText("Masukkan nilai n"); |
|  |  |
|  | jLabel4.setText("Nilai f(x)"); |
|  |  |
|  | tombolhitung.setText("Hitung"); |
|  | tombolhitung.addActionListener(new java.awt.event.ActionListener() { |
|  | public void actionPerformed(java.awt.event.ActionEvent evt) { |
|  | hitung(evt); |
|  | } |
|  | }); |
|  |  |
|  | tombolreset.setText("Reset"); |
|  | tombolreset.addActionListener(new java.awt.event.ActionListener() { |
|  | public void actionPerformed(java.awt.event.ActionEvent evt) { |
|  | reset(evt); |
|  | } |
|  | }); |
|  |  |
|  | jTextArea1.setColumns(20); |
|  | jTextArea1.setRows(5); |
|  | jTextArea1.setText("Keterangan:\n- Nilai f(x) adalah aproksimasi dengan menggunakan deret Taylor dengan n angka penting.\n- Nilai a, n, x yang dimasukkan harus berupa angka. \n Jika menyatakan angka desimal, gunakan tanda \".\" bukan \",\"."); |
|  | jScrollPane1.setViewportView(jTextArea1); |
|  |  |
|  | 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() |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING) |
|  | .addGroup(javax.swing.GroupLayout.Alignment.LEADING, layout.createSequentialGroup() |
|  | .addContainerGap() |
|  | .addComponent(jScrollPane1)) |
|  | .addGroup(layout.createSequentialGroup() |
|  | .addGap(34, 34, 34) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addComponent(boxsoal, 0, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE) |
|  | .addGroup(layout.createSequentialGroup() |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addComponent(jLabel1, javax.swing.GroupLayout.DEFAULT\_SIZE, 118, Short.MAX\_VALUE) |
|  | .addComponent(jLabel2, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE) |
|  | .addComponent(jLabel3, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE) |
|  | .addComponent(jLabel4, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)) |
|  | .addGap(36, 36, 36) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addComponent(inputx) |
|  | .addComponent(inputa) |
|  | .addComponent(inputn) |
|  | .addComponent(nilaifx, javax.swing.GroupLayout.DEFAULT\_SIZE, 136, Short.MAX\_VALUE)))) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 153, Short.MAX\_VALUE) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addGroup(layout.createSequentialGroup() |
|  | .addComponent(tombolhitung) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 72, Short.MAX\_VALUE) |
|  | .addComponent(tombolreset)) |
|  | .addComponent(labelsoal, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))) |
|  | .addGroup(layout.createSequentialGroup() |
|  | .addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE) |
|  | .addComponent(labelsyarat, javax.swing.GroupLayout.PREFERRED\_SIZE, 309, javax.swing.GroupLayout.PREFERRED\_SIZE))) |
|  | .addContainerGap()) |
|  | ); |
|  | layout.setVerticalGroup( |
|  | layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING) |
|  | .addGroup(layout.createSequentialGroup() |
|  | .addGap(30, 30, 30) |
|  | .addComponent(boxsoal, 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, false) |
|  | .addGroup(layout.createSequentialGroup() |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addComponent(inputx) |
|  | .addComponent(jLabel1, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addComponent(inputa) |
|  | .addComponent(jLabel2, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false) |
|  | .addComponent(inputn) |
|  | .addComponent(jLabel3, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))) |
|  | .addComponent(labelsoal, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)) |
|  | .addGap(18, 18, 18) |
|  | .addComponent(labelsyarat, javax.swing.GroupLayout.PREFERRED\_SIZE, 26, javax.swing.GroupLayout.PREFERRED\_SIZE) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE) |
|  | .addComponent(jLabel4) |
|  | .addComponent(nilaifx, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED) |
|  | .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE) |
|  | .addComponent(tombolhitung) |
|  | .addComponent(tombolreset)) |
|  | .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED) |
|  | .addComponent(jScrollPane1, javax.swing.GroupLayout.DEFAULT\_SIZE, 148, Short.MAX\_VALUE) |
|  | .addContainerGap()) |
|  | ); |
|  |  |
|  | boxsoal.getAccessibleContext().setAccessibleName(""); |
|  |  |
|  | pack(); |
|  | }// </editor-fold>//GEN-END:initComponents |
|  |  |
|  | private void pilihsoal(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_pilihsoal |
|  | // TODO add your handling code here: |
|  | switch(boxsoal.getSelectedIndex()) |
|  | { |
|  | case 1: |
|  | labelsoal.setText("ln(-x)"); |
|  | labelsyarat.setText("Syarat: a <0, n bilangan bulat positif, x <0"); |
|  | inputa.setText(""); |
|  | inputx.setText(""); |
|  | inputn.setText(""); |
|  | nilaifx.setText(""); |
|  | break; |
|  |  |
|  | case 2: |
|  | labelsoal.setText("cosh(-6x)"); |
|  | labelsyarat.setText("Syarat: a bil real, n bil bulat positif, x bil real"); |
|  | inputa.setText(""); |
|  | inputx.setText(""); |
|  | inputn.setText(""); |
|  | nilaifx.setText(""); |
|  | break; |
|  |  |
|  | case 3: |
|  | labelsoal.setText("x / (1-x)"); |
|  | labelsyarat.setText("Syarat: a bil real, n bil bulat positif, -1 < x < 1 "); |
|  | inputa.setText(""); |
|  | inputx.setText(""); |
|  | inputn.setText(""); |
|  | nilaifx.setText(""); |
|  | break; |
|  |  |
|  | } |
|  | }//GEN-LAST:event\_pilihsoal |
|  |  |
|  | private void hitung(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_hitung |
|  | // TODO add your handling code here: |
|  | double a = Double.parseDouble(inputa.getText()); |
|  | double n = Double.parseDouble(inputn.getText()); |
|  | double x = Double.parseDouble(inputx.getText()); |
|  |  |
|  | switch(boxsoal.getSelectedIndex()) |
|  | { |
|  |  |
|  | case 1: |
|  | nilaifx.setText(String.valueOf(HasilSoal1(a, n, x))); |
|  | break; |
|  |  |
|  | case 2: |
|  | nilaifx.setText(String.valueOf(HasilSoal2(a, n, x))); |
|  | break; |
|  |  |
|  | case 3: |
|  | nilaifx.setText(String.valueOf(HasilSoal3(a, n, x))); |
|  | break; |
|  | } |
|  | }//GEN-LAST:event\_hitung |
|  |  |
|  | private void reset(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_reset |
|  | // TODO add your handling code here: |
|  | inputa.setText(""); |
|  | inputx.setText(""); |
|  | inputn.setText(""); |
|  | nilaifx.setText(""); |
|  | }//GEN-LAST:event\_reset |
|  |  |
|  | public static double HasilSoal1(double a, double n, double x){ |
|  | double[] f = new double[10001]; |
|  | f[0] = Math.log(-a); |
|  | double Fungsi=0; |
|  | double es = 0.5 \* Math.pow(10, 2-n); |
|  | for(int i=1; i<=10000; i++){ |
|  | f[i]=f[i-1] + (Math.pow(-1,i+1)\*Math.pow(x-a, i))/(i\*Math.pow(a,i)); |
|  | double ea = ((f[i]-f[i-1])/f[i])\*100; |
|  | if(Math.abs(ea)<es){ |
|  | Fungsi += f[i]; |
|  | System.out.println(i); |
|  | break; |
|  | } |
|  | } |
|  | double Output = Math.floor(Fungsi\*10000)/10000; |
|  | return Output; |
|  |  |
|  | } |
|  |  |
|  | public static double HasilSoal2(double a, double n, double x){ |
|  | double[] f = new double[10001]; |
|  | f[0] = (Math.exp(6\*a)+Math.exp(-6\*a))/2; |
|  | double Fungsi=0; |
|  | double es = 0.5 \* Math.pow(10, 2-n); |
|  | for(int i=1; i<=10000; i++){ |
|  | if(a==0){ |
|  | f[i]=f[i-1] + Math.pow(6\*x,2\*i)/faktorial(2\*i); |
|  | }else{ |
|  | f[i]=f[i-1] + (( Math.exp(6\*a) + Math.pow(-1,i)\*Math.exp(-6\*a))\*(Math.pow(6,i)\*Math.pow(x-a,i)))/(2\*(faktorial(i))); |
|  | } |
|  | double ea = ((f[i]-f[i-1])/f[i])\*100; |
|  | if(Math.abs(ea)<es){ |
|  | Fungsi += f[i]; |
|  | break; |
|  | } |
|  | } |
|  | double Output = Math.floor(Fungsi\*10000)/10000; |
|  | return Output; |
|  |  |
|  | } |
|  |  |
|  | public static double HasilSoal3(double a, double n, double x) { |
|  | double[] f = new double[10001]; |
|  | f[0] = a/(1-a); |
|  | double Fungsi=0; |
|  | double es = 0.5 \* Math.pow(10, 2-n); |
|  | for(int i=1; i<=10000; i++){ |
|  | f[i]=f[i-1]+deret(x, a, i); |
|  | double ea = ((f[i]-f[i-1])/f[i])\*100; |
|  | if(Math.abs(ea)<es){ |
|  | Fungsi += f[i]; |
|  | System.out.println(i); |
|  | break; |
|  | } |
|  | } |
|  | double Output = Math.floor(Fungsi\*10000)/10000; |
|  | return Output; |
|  | } |
|  | /\*\* |
|  | \* @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(guii.class.getName()).log(java.util.logging.Level.SEVERE, null, ex); |
|  | } catch (InstantiationException ex) { |
|  | java.util.logging.Logger.getLogger(guii.class.getName()).log(java.util.logging.Level.SEVERE, null, ex); |
|  | } catch (IllegalAccessException ex) { |
|  | java.util.logging.Logger.getLogger(guii.class.getName()).log(java.util.logging.Level.SEVERE, null, ex); |
|  | } catch (javax.swing.UnsupportedLookAndFeelException ex) { |
|  | java.util.logging.Logger.getLogger(guii.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 guii().setVisible(true); |
|  | } |
|  | }); |
|  | } |
|  |  |
|  | // Variables declaration - do not modify//GEN-BEGIN:variables |
|  | private javax.swing.JComboBox<String> boxsoal; |
|  | private javax.swing.JTextField inputa; |
|  | private javax.swing.JTextField inputn; |
|  | private javax.swing.JTextField inputx; |
|  | private javax.swing.JLabel jLabel1; |
|  | private javax.swing.JLabel jLabel2; |
|  | private javax.swing.JLabel jLabel3; |
|  | private javax.swing.JLabel jLabel4; |
|  | private javax.swing.JScrollPane jScrollPane1; |
|  | private javax.swing.JTextArea jTextArea1; |
|  | private javax.swing.JLabel labelsoal; |
|  | private javax.swing.JLabel labelsyarat; |
|  | private javax.swing.JTextField nilaifx; |
|  | private javax.swing.JButton tombolhitung; |
|  | private javax.swing.JButton tombolreset; |
|  | // End of variables declaration//GEN-END:variables |
|  |  |
|  |  |
|  | } |

1. **RUNNING PROGRAM**

**[LAMPIRKAN GAMBAR HASIL SCREENSHOT DI DALAM SINI]**

