

# Graphical User Interface

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BRIGIDA ARIE MINARTININGTYAS, M.KOM.

# User Interfaces digunakan untuk

Menerima input  
dari user

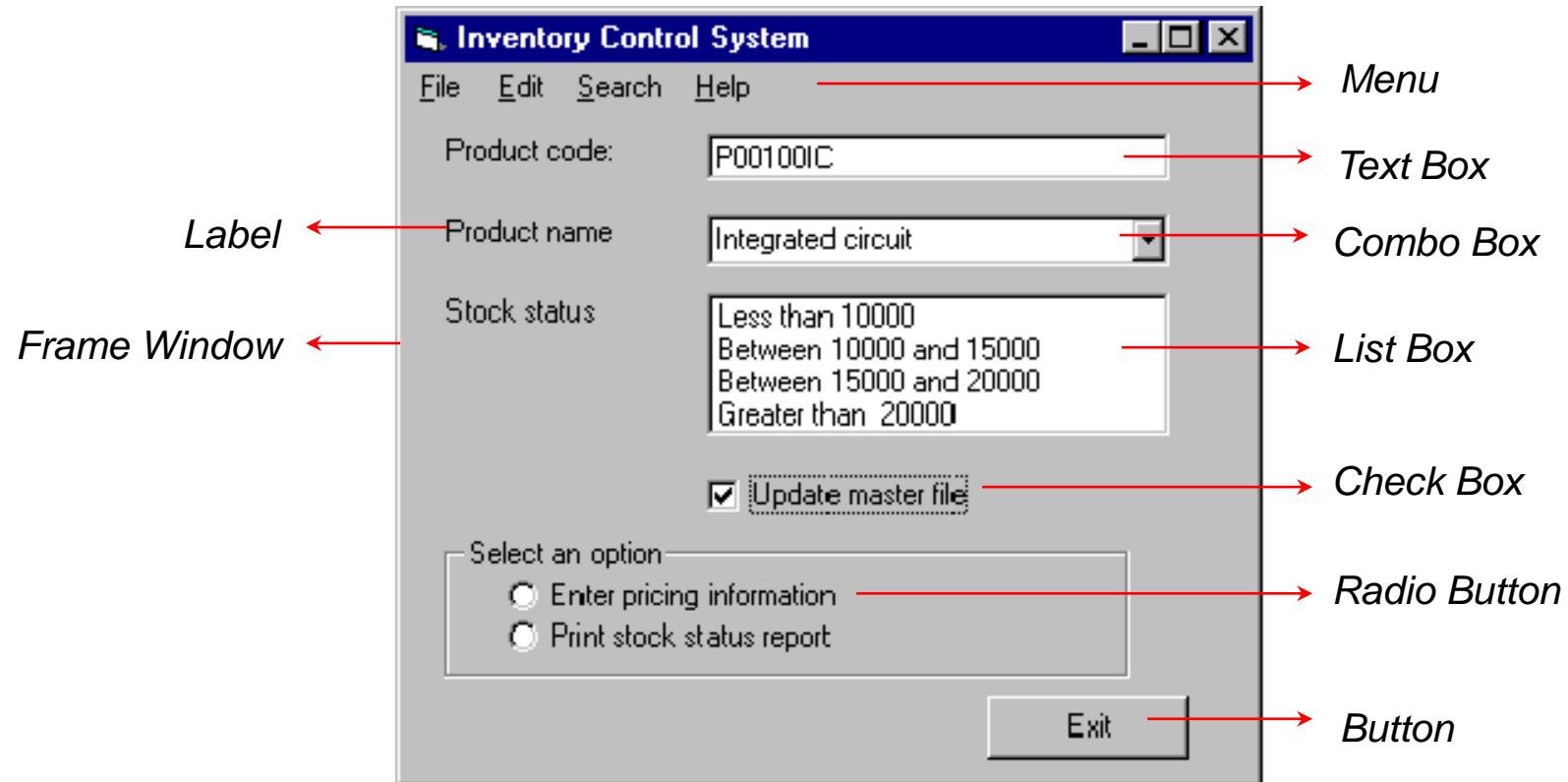
Membuat  
aplikasi menjadi  
*user-friendly*

# Tipe User Interfaces

Character User  
Interface (CUI)

Graphical User  
Interface (GUI)

# Komponen GUI



# Paket Pengembangan Program GU di JAVA

## AWT

- Komponen AWT diimport dari library `java.awt.*`

## SWING

- Komponen SWING diimport dari `javax.swing.*`.

## AWT

- dibawa oleh Java diawal kemunculannya ketika masih mengusung nama Java (Bukan Java 2)
- bentuk dari objek-objek AWT akan mengikuti bentuk default yang dibawa oleh sistem operasi, misalnya WINDOWS.
- hampir semua komponen AWT adalah turunan dari Class Component

## SWING

- sebutan bagi objek visual yang dibawa Java 2
- objek-objek Swing merupakan pengembangan dari objek AWT
- objek Swing memiliki desain yang berbeda dibandingkan dengan desain default dari sistem operasi.
- objek Swing adalah objek visual yang mengusung teknologi Java murni.
- hampir semua komponen Swing adalah turunan dari Class JComponent

# Fitur SWING

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1. **Komponen GUI Lengkap**: button, listbox, combobox, textarea, dsb
2. **Pluggable Look-and-Feel**: tampilan GUI dapat diubah sesuai dengan kehendak (tidak perlu mengikuti native sistem operasi)
3. **Data Transfer Antar Komponen**: drag and drop, copy and paste
4. **Internationalization**: proses desain aplikasi yang memungkinkan aplikasi dijalankan sesuai dengan preferensi tanpa rekompilasi
5. **Localization**: proses translasi teks ke bahasa lokal dan menambahkan komponen lokal

# Komponen Dasar SWING

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1. **Top-Level Container:** kontainer dasar dimana komponen lainnya diletakkan ([JFrame](#), [JDialog](#) dan [Applet](#))
2. **Intermediate Container:** kontainer perantara dimana komponen lainnya diletakkan ( [JPanel](#),  [JScrollPane](#),  [JTabbedPane](#),  [JToolbar](#),  [JSplitPane](#))
3. **Atomic Component:** komponen yang memiliki fungsi spesifik dan menerima interaksi langsung dari user ( [JButton](#),  [JLabel](#),  [JTextArea](#), dsb)
4. **Layout Manager:** mengatur tata letak dan posisi komponen dalam kontainer ( [BorderLayout](#),  [BoxLayout](#),  [FlowLayout](#),  [GridBagLayout](#),  [GridLayout](#))
5. **Event Handling:** menangani event yang dilakukan user ( [klik mouse](#),  [ketik keyboard](#),  [perbesar frame](#), dsb)

# Komponen SWING

## JComponent

- Kelas induk untuk semua komponen Swing

## JButton

- Tombol “push”

## JCheckBox

- Item yang dapat dipilih atau tidak oleh pengguna

## JFileChooser

- Mengijinkan pengguna untuk memilih sebuah file

## JTextField

- Mengijinkan untuk mengedit text satu baris.

# Komponen SWING

## JFrame

- Perlu mendapatkan content pane yang terbaru sebelum menambah sebuah komponen

## JPanel

- Turunan Jcomponent. Kontainer class sederhana tetapi bukan top-level

## JApplet

- Menambahkan komponen pada kontainer

## JOptionPane

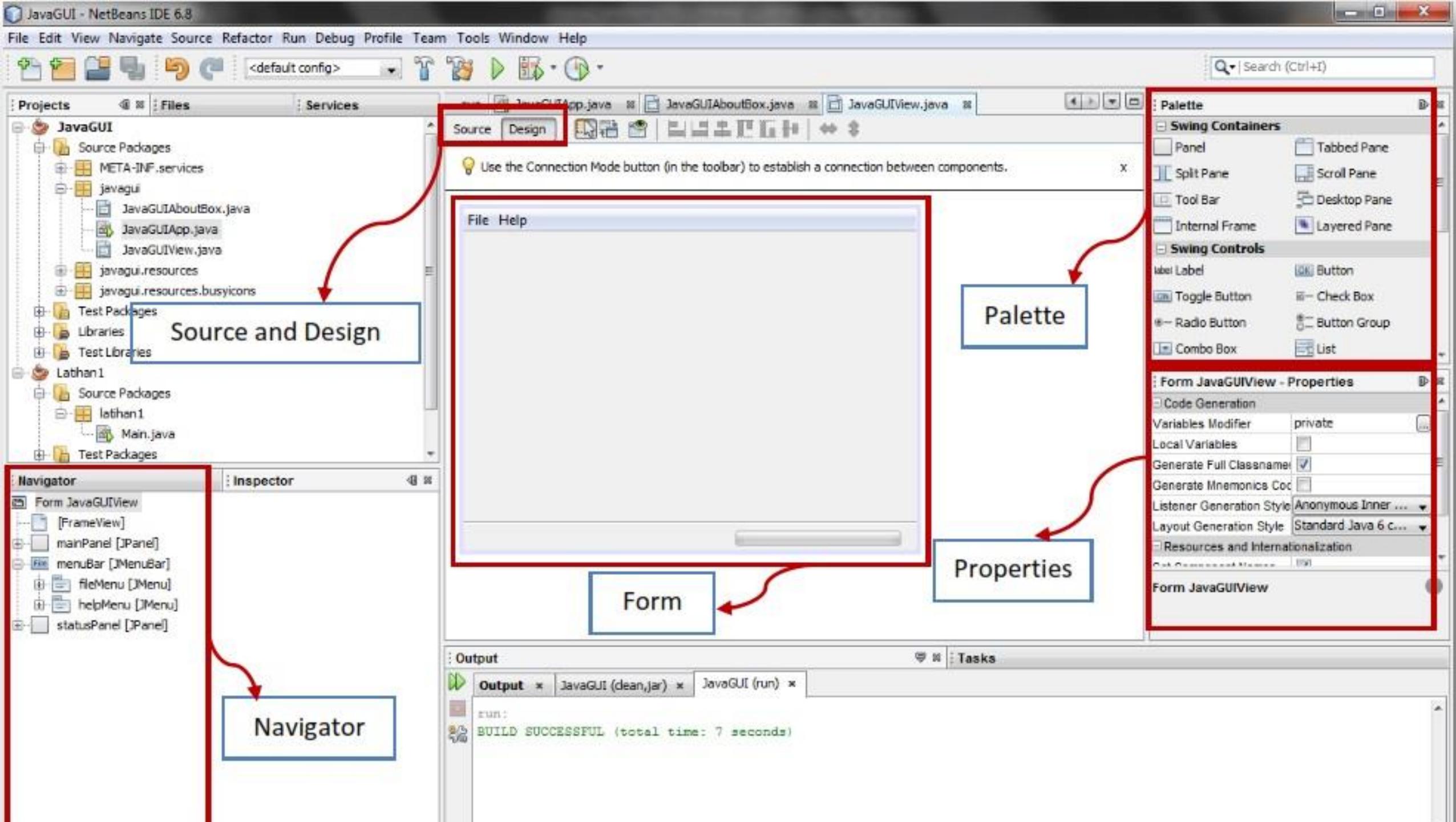
- Turunan JComponent. Disediakan untuk mempermudah menampilkan popup kotak dialog

## JDialog

- Biasanya digunakan untuk menginformasikan sesuatu kepada pengguna atau prompt pengguna untuk input

## JColorChooser

- Turunan Jcomponent. Mengijinkan pengguna untuk memilih warna





[JButton](#)



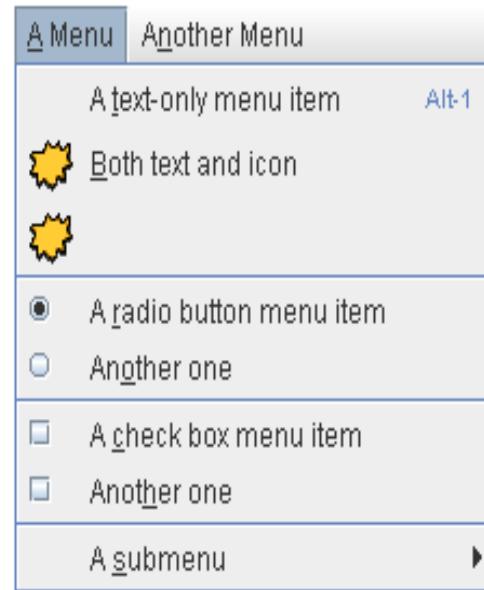
[JCheckBox](#)



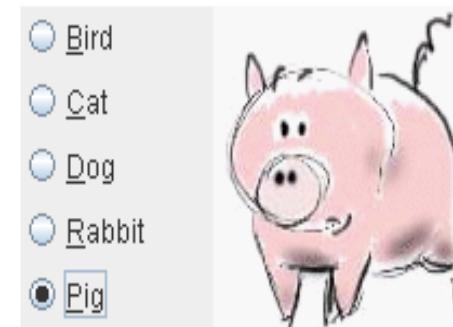
[JComboBox](#)



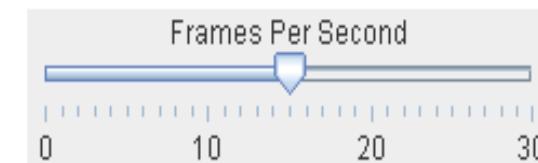
[JList](#)



[JMenu](#)



[JRadioButton](#)



[JSlider](#)



[JSpinner](#)



[JTextField](#)

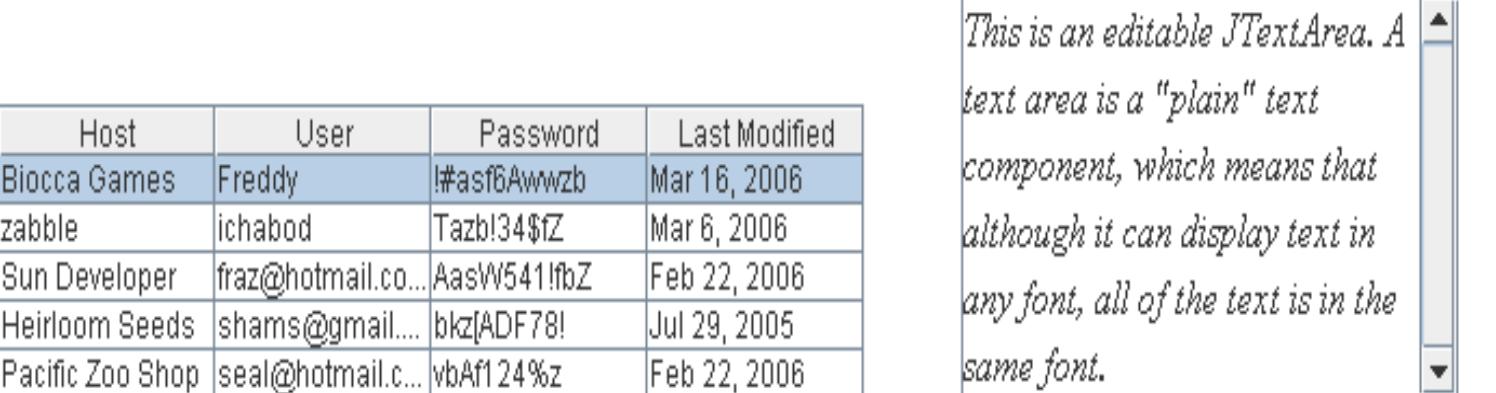


[JPasswordField](#)

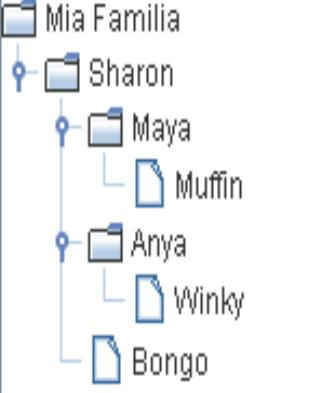
Host	User	Password	Last Modified
Biocca Games	Freddy	!#ASF6Awwzb	Mar 16, 2006
zabble	ichabod	Tazb!34\$fZ	Mar 6, 2006
Sun Developer	fraz@hotmail.co...	AasW541fbZ	Feb 22, 2006
Heirloom Seeds	shams@gmail....	bkz[ADF78!	Jul 29, 2005
Pacific Zoo Shop	seal@hotmail.c...	vbAf124%z	Feb 22, 2006

[JTable](#)

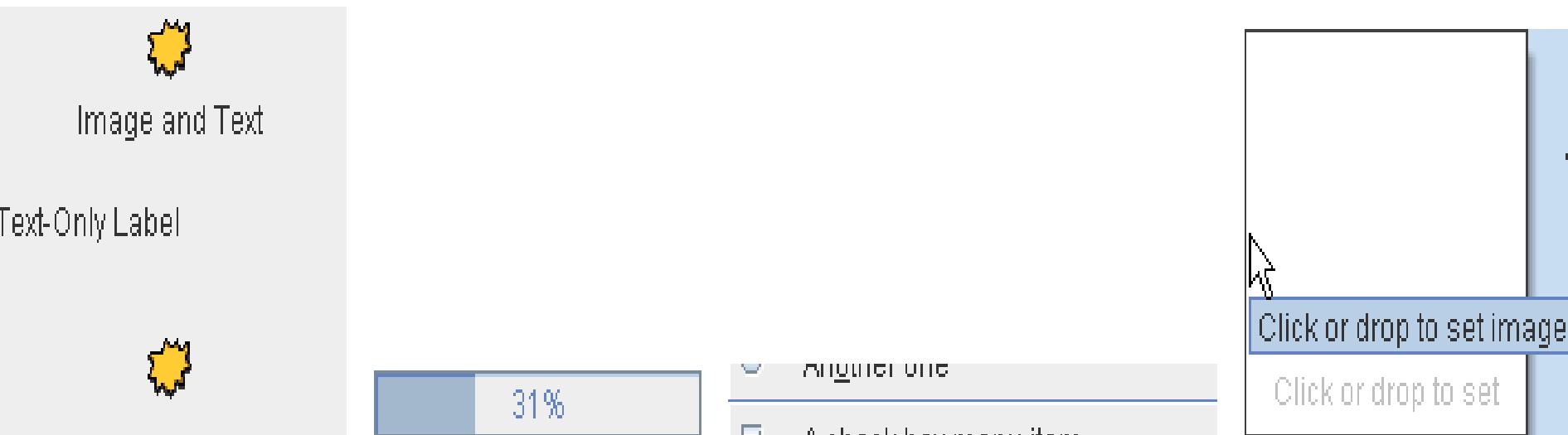
*This is an editable JTextArea. A text area is a "plain" text component, which means that although it can display text in any font, all of the text is in the same font.*



[JTextArea](#)



[JTree](#)



[JLabel](#)

[ProgressBar](#)

[JSeparator](#)

[JToolTip](#)

Swing.java

Source Design

Use the Connection Mode button (in the toolbar) to establish a connection between components.

Data Mahasiswa

Nama: [Text Field]

NIM: [Text Field]

Jurusan:  Laki - Laki  Perempuan

Hobby:  Coding  Tidur  Makan

Jurusan: TI-MTI  
TI-DGM  
SK

Semester: Semester 1

Bersihkan Tampilkan

Drag And Drop Component yang dibutuhkan

Palette

Swing Controls

- label Label
- OK Button
- ON Toggle Button
- Check Box
- Radio Button
- Button Group
- Combo Box
- List
- Text Field
- Text Area
- ScrollBar
- Slider
- ProgressBar
- Formatted Field
- Password Field
- Spinner
- Separator
- Text Pane
- Editor Pane
- Tree

Swing Menus

Properties

Name	Swing
Extension	java
All Files	C:\Users\SERVER\Music\...
File Size	14970
Modification Time	Sep 5, 2013 9:49:09 PM

Classpaths

Compile Classpath	...
Runtime Classpath	C:\Users\SERVER\Music\...
Boot Classpath	C:\Program Files\Java\jdk...

Swing.java

Output - JavaGui (run)

Tasks

# Diskusi

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1. Apa perbedaan jTextField dan jTextArea ?
2. Apa perbedaan jRadioButton dan jCheckBox?
3. Pada kasus data list semacam apa sehingga kita tidak baik menggunakan dropdown list?

# Event Handler

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- Di Java, event merepresentasikan semua interaksi antara aplikasi dan user.
- Event Handling sangatlah esensial di dalam GUI
- Ketika user berinteraksi dengan program (misalnya dengan meng-klik button), sistem akan menciptakan sebuah event yang merupakan representasi aksi tersebut dan mendeklasikannya ke kode event-handling di dalam program.
- Kode event-handling ini (event handler) menentukan bagaimana sistem menghandle event sehingga user mendapat respons yang sesuai.

## Event Object

- ketika user berinteraksi dengan aplikasi dengan menekan tombol keyboard atau click button misalnya, sebuah event object digenerate. Sistem Operasi menangkap event ini dan data-datanya. Informasi yang ada dalam event ini:
  - Kategori event (clicking button, mouse over, pressing key, closing window, dll)
  - Komponen yang men-generate event (button, combo box, textbox, dll)
  - Saat event terjadi

## Event Source

- objek yg men-generate sebuah event.
- Misalnya, click button, maka button adalah event source-nya.

## Event Handler

- sebuah method yang mengerti event dan memprosesnya.
- Parameternya sebuah event objek.

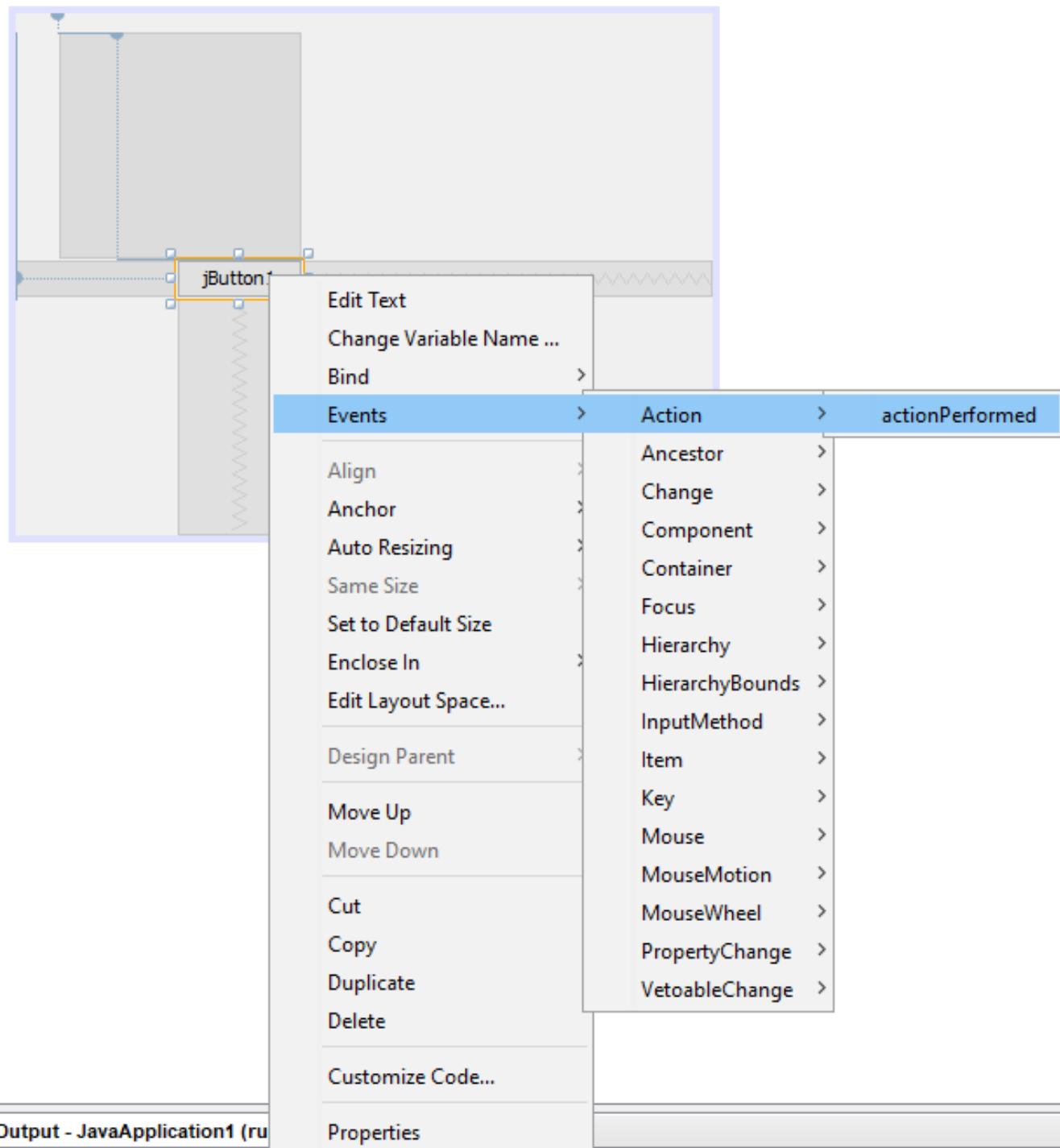
<b>Event Source</b>	<b>Event Object</b>	<b>Interface Name</b>	<b>Event Handler</b>
Window	WindowEvent	Window Listener	<code>void windowOpened (WindowEvent e)</code> <code>void windowClosing (WindowEvent e)</code> <code>void windowActivated (WindowEvent e)</code> <code>void windowDeactivated (WindowEvent e)</code> <code>void windowClosed (WindowEvent e)</code> <code>void windowIconified (WindowEvent e)</code> <code>void windowDeiconified (WindowEvent e)</code>

<b>Event Source</b>	<b>Event Object</b>	<b>Interface Name</b>	<b>Event Handler</b>
Component	Focus Event	Focus Listener	<pre>void focusGained (FocusEvent e) void focusLost (FocusEvent e)</pre>
Component	Component Event	Component Listener	<pre>void componentMoved (ComponentEvent e) void componentResized (ComponentEvent e)</pre>
Component	Action Event	Action Listener	<pre>void actionPerformed (ActionEvent e)</pre>

<b>Event Source</b>	<b>Event Object</b>	<b>Interface Name</b>	<b>Event Handler</b>
Item	Item Event	Item Listener	<code>void itemStateChanged (ItemEvent e)</code>
Component	Mouse Event	MouseMotion Listener	<code>void mouseDragged (MouseEvent e)</code> <code>void mouseMoved (MouseEvent e)</code>

<b>Event Source</b>	<b>Event Object</b>	<b>Interface Name</b>	<b>Event Handler</b>
Component	Mouse Event	MouseListener	<code>void mousePressed (MouseEvent e)</code> <code>void mouseReleased (MouseEvent e)</code> <code>void mouseEntered (MouseEvent e)</code> <code>void mouseExited (MouseEvent e)</code> <code>void mouseClicked (MouseEvent e)</code>

Kategori	Interface	Method
Action	ActionListener	actionPerformed(ActionEvent)
Item	ItemListener	itemStateChanged(ItemEvent)
Mouse	MouseListener	mouseClicked(MouseEvent) mouseEntered(MouseEvent) mouseExited(MouseEvent) mousePressed(MouseEvent) mouseReleased(MouseEvent)
Mouse Motion	MouseMotionListener	mouseDragged(MouseEvent) mouseMoved(MouseEvent)
Key	KeyListener	keyPressed(KeyEvent) keyReleased(KeyEvent) keyTyped(KeyEvent)
Focus	FocusListener	focusGained(FocusEvent) focusLost(FocusEvent)
Window	WindowListener	windowClosing(WindowEvent) windowOpened(WindowEvent) windowActivated(WindowEvent) windowDeactivated(WindowEvent)



Swing.java

Source Design

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TI-DGM  
SK

Semester: Semester 1

Bersihkan Tampilkan

Drag And Drop Component yang dibutuhkan

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Swing Menus

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Compile Classpath	...
Runtime Classpath	C:\Users\SERVER\Music\...
Boot Classpath	C:\Program Files\Java\jdk...

Swing.java

Output - JavaGui (run)

Tasks

Swing.java

Source Design

1

2  import javax.swing.JOptionPane;

3

4 /\*

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

6 \* and open the template in the editor.

7 \*/

8

9 /\*

10 \* Swing.java

11 \*

12 \* Created on Sep 5, 2013, 6:56:41 PM

13 \*/

14  /\*\*

15 \*

16 \* @author SERVER

17 \*/

18 public class Swing extends javax.swing.JFrame {

19  private String nama,nim,jurusan,hobi,info,jeniskelamin,semester;

20  /\*\* Creates new form Swing \*/

21  public Swing() {

22 initComponents();

23 }

24  /\*\* This method is called from within the constructor to

25 \* initialize the form.

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

27 \* always regenerated by the Form Editor.

28 \*/

29 @SuppressWarnings("unchecked")

30  Generated Code

208

209  private void txtnimActionPerformed(java.awt.event.ActionEvent evt) {

Klik Disini (Source)

Ini Variabel yang harus anda Tambahkan

```
] private void cmdtampilActionPerformed(java.awt.event.ActionEvent evt) {  
    // TODO add your handling code here:  
    nama=txtnama.getText();  
    nim=txtnim.getText();  
    if (cbhobi1.isSelected())  
        hobi = "Coding";  
    if (cbhobi2.isSelected())  
        hobi += " ,Tidur";  
    if (cbhobi3.isSelected())  
        hobi += " ,Makan";  
  
    if (rdjurusan1.isSelected())  
        jeniskelamin = "Laki - Laki";  
    else  
        jeniskelamin = "Perempuan";  
  
    jurusan = listjurusan.getSelectedValue().toString();  
    semester = comsemester.getSelectedItem().toString();  
  
    info="Nama      : "+nama+"\n";  
    info+="NIM      : "+nim+"\n";  
    info+="Jenis Kelamin : "+jeniskelamin+"\n";  
    info+="Jurusan : "+jurusan+"\n";  
    info+="Semester : "+semester+"\n";  
    info+="Hobi     : "+hobi+"";  
    hasil.setText(info);  
    JOptionPane.showMessageDialog(null, info);  
}
```

```
private void cmdbersihActionPerformed(java.awt.event.ActionEvent evt) {  
// TODO add your handling code here:  
    txtnama.setText("");  
    txtnim.setText("");  
    cbhobi1.setSelected(false);  
    cbhobi2.setSelected(false);  
    cbhobi3.setSelected(false);  
    hasil.setText("");  
}  
|
```

### Data Mahasiswa

Nama	Adi Panca Saputra Iskandar
NIM	11101420
Jurusan	<input checked="" type="radio"/> Laki - Laki <input type="radio"/> Perempuan
Hobby	<input checked="" type="checkbox"/> Coding <input type="checkbox"/> Tidur <input type="checkbox"/> Makan
Jurusan	TI-MTI TI-DGM
Semester	Semester 5

**Bersihkan** **Tampilkan**

**Message**

**i** Nama : Adi Panca Saputra Iskandar  
NIM : 11101420  
Jenis Kelamin : Laki - Laki  
Jurusan : TI-MTI  
Semester : Semester 5  
Hobi : Coding

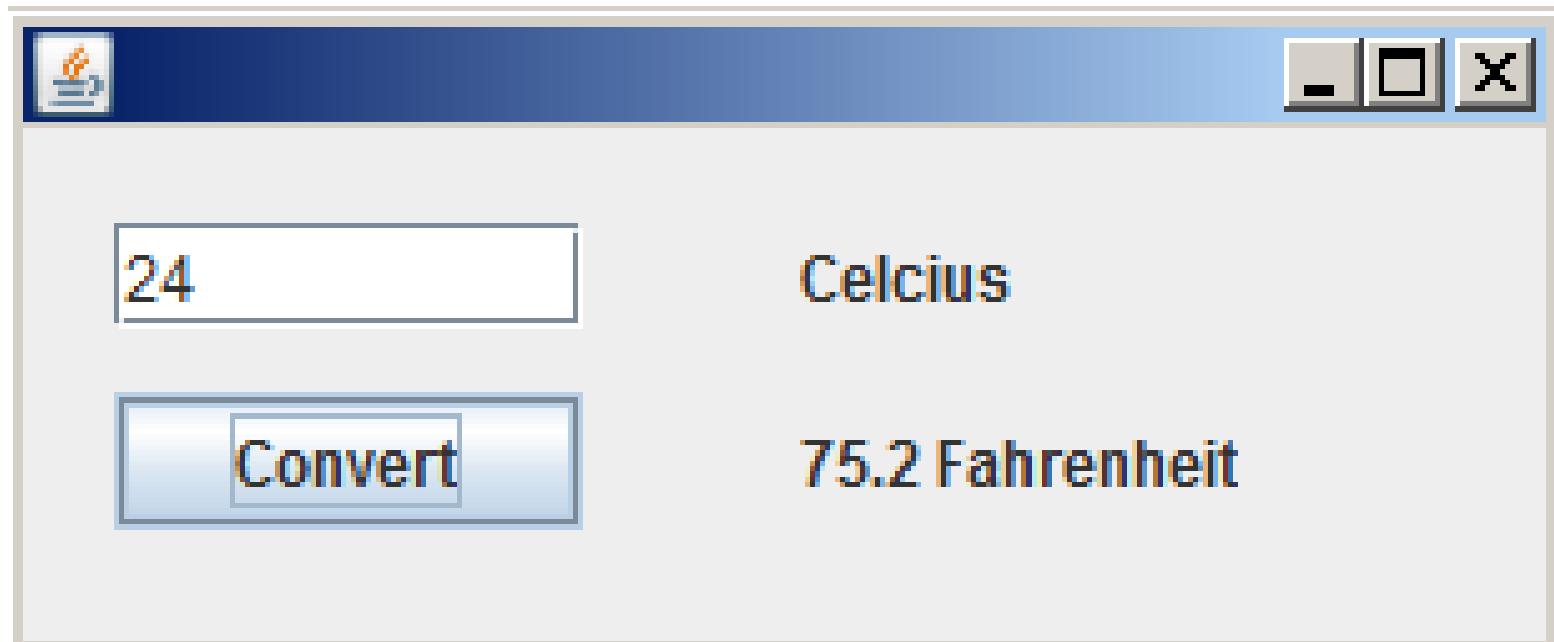
**OK**

# Aplikasi Konversi Suhu

---

GUI COMPONENT: TEXTFIELD, LABEL, BUTTON

EVENTS: ACTIONPERFORMED, MOUSECLICKED



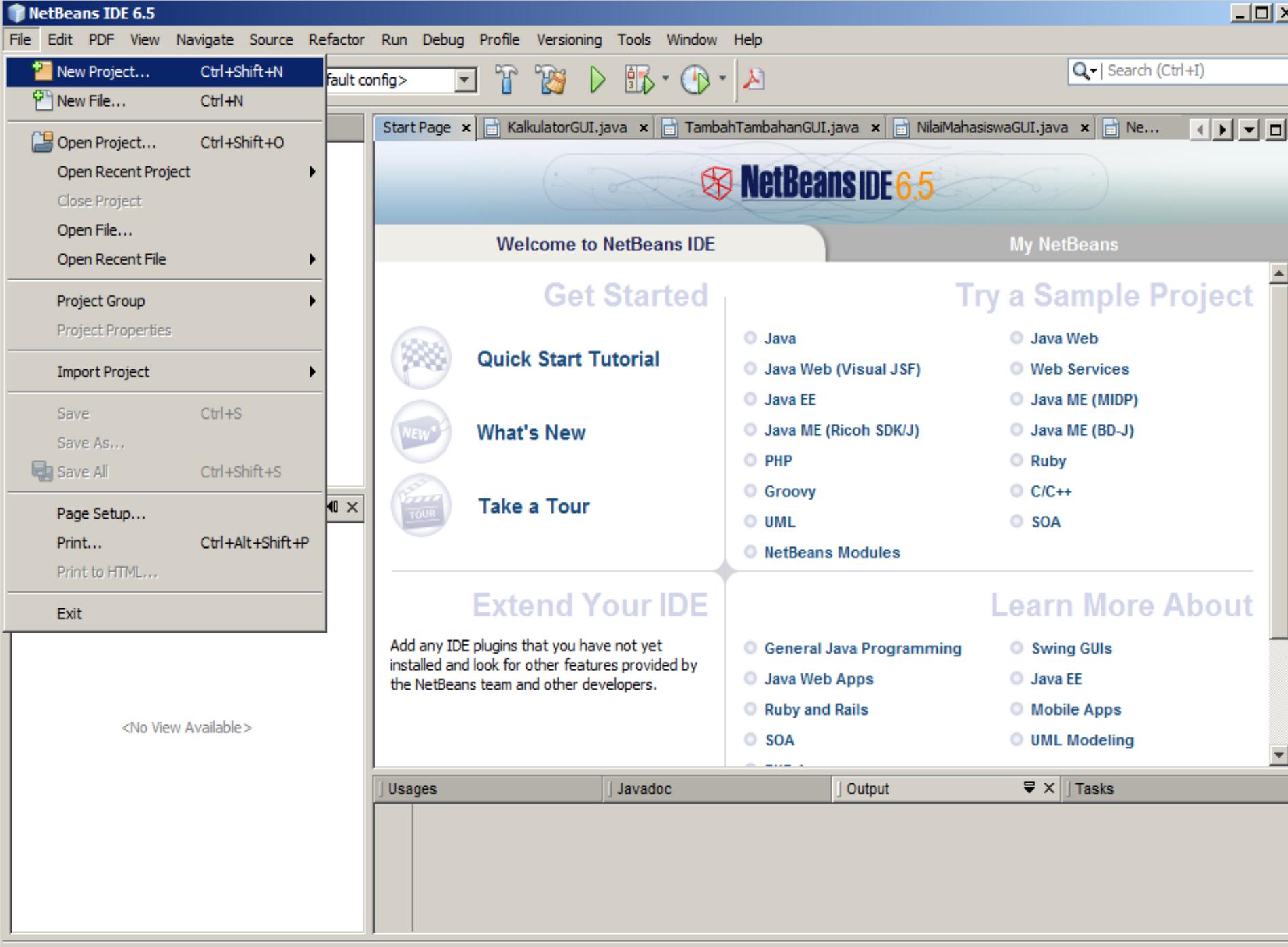
# Algoritma untuk Event Handling

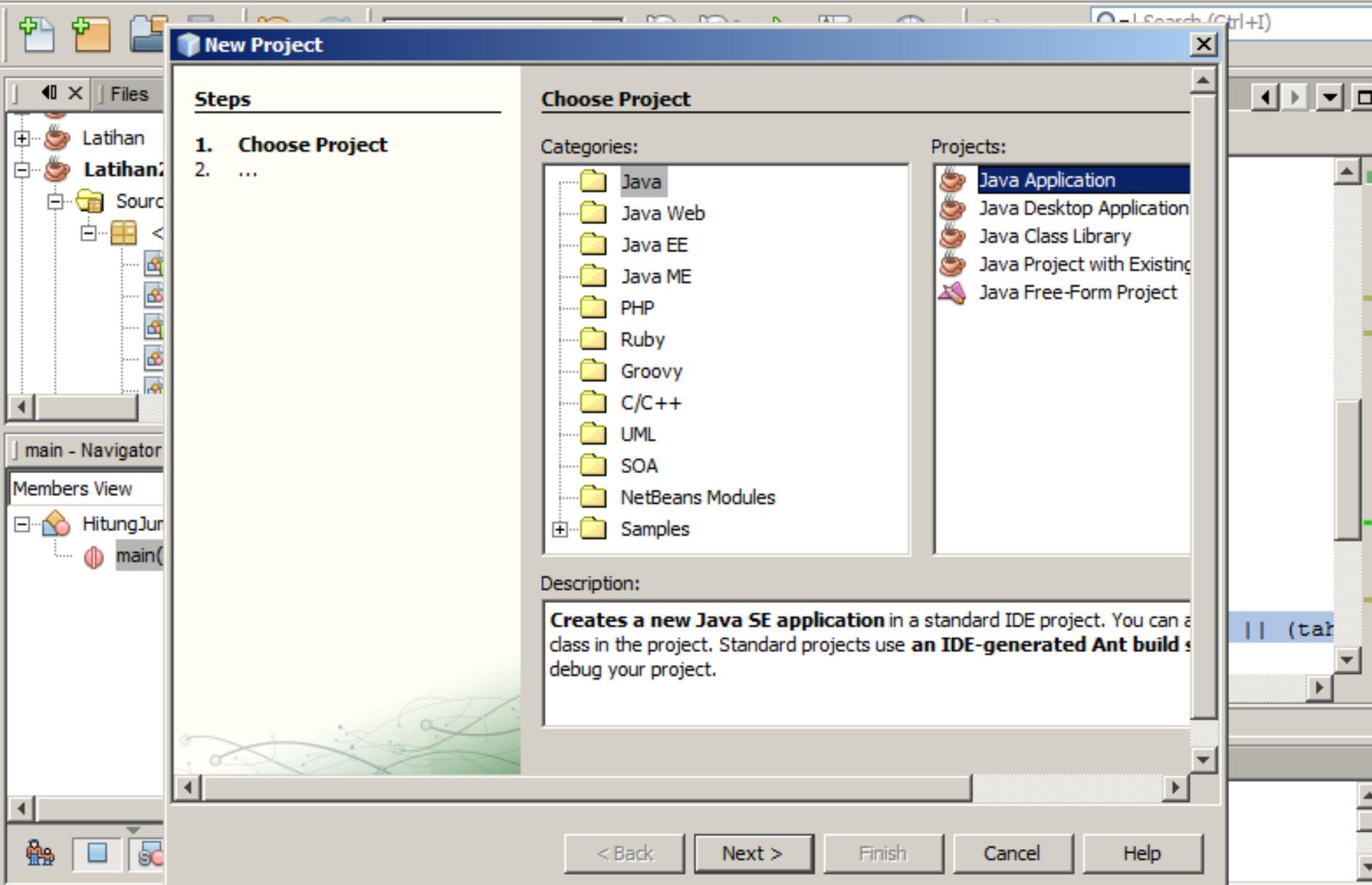
---

1. Ambil Isi dari textfield, simpan dalam variabel celcius
2. Konversi celcius ke fahrenheit dengan rumus di bawah, dan simpan hasilnya dalam variabel fahrenheit  
$$\text{fahrenheit} = 1.8 * \text{celcius} + 32$$
3. Tempelkan hasil (fahrenheit) ke label fahrenheit (menimpa isi lama)

# 1. Membuat Project Baru

---





# 2. Memberi Nama Project

---

NAMA PROJECT: CELCIUSTOFAHRENHEIT

UNCHECK: CREATE MAIN CLASS

New Java Application

Steps

1. Choose Project  
2. Name and Location

Name and Location

Project Name: CelciusToFahrenheit

Project Location: C:\Users\Romi Satria Wahono\Documents\NetBeansProjects

Project Folder: \Users\Romi Satria Wahono\Documents\NetBeansProjects\CelciusToFahrenheit

Use Dedicated Folder for Storing Libraries

Libraries Folder:

Different users and projects can share the same compilation libraries (see Help for details).

Create Main Class celciustofahrenheit.Main

Set as Main Project

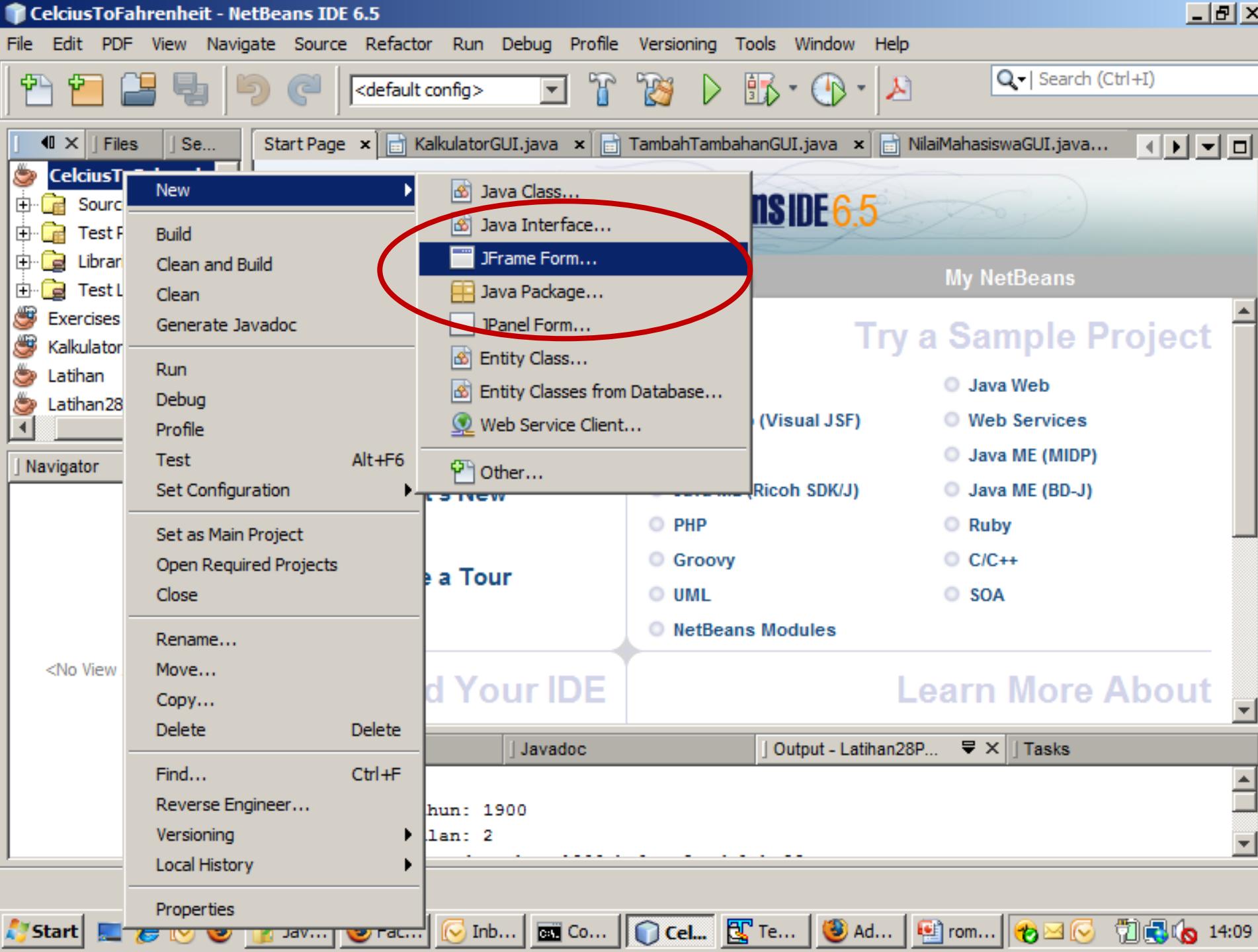
< Back Next > Finish Cancel Help

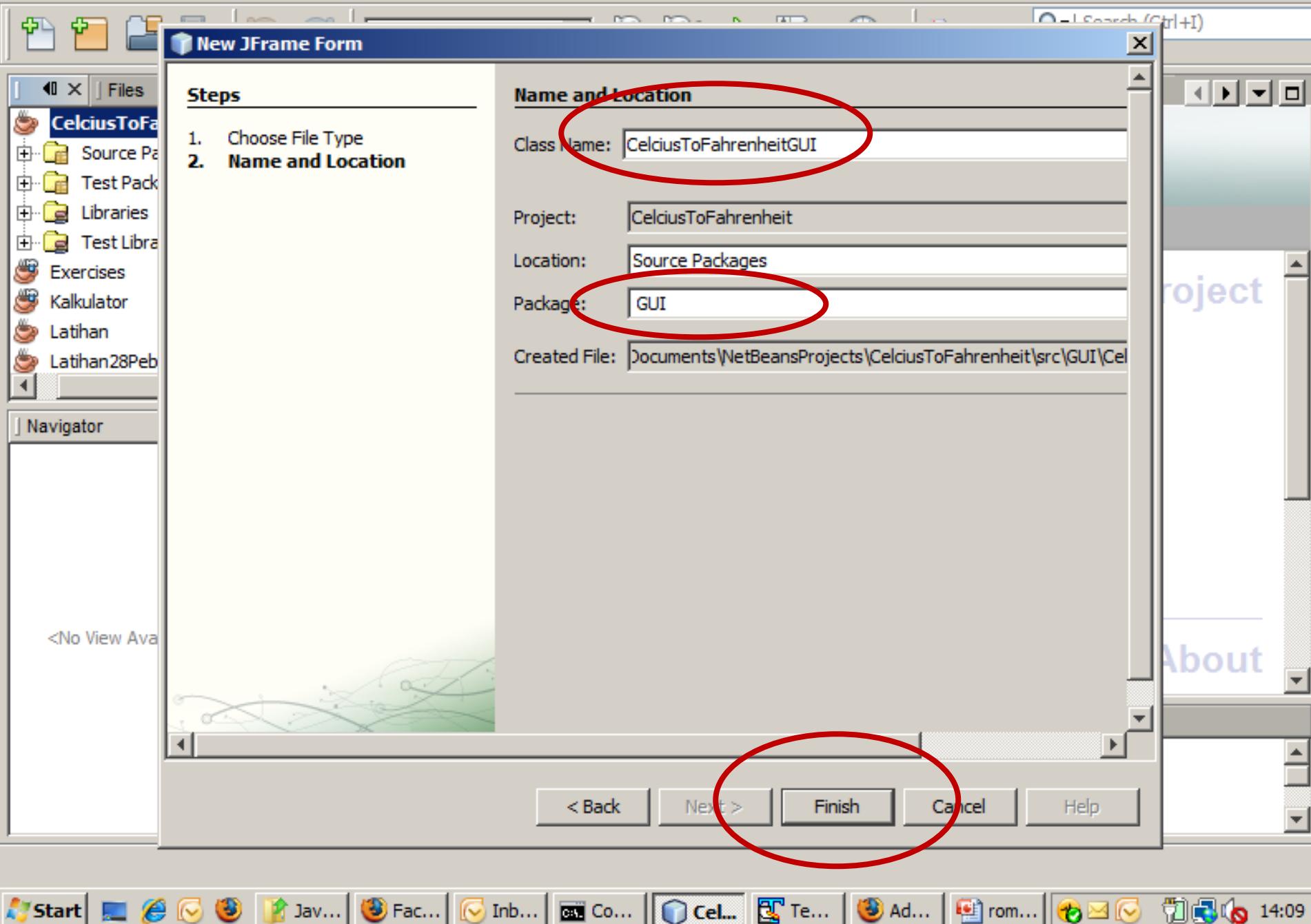
# 3. Menambahkan JFrame Form Pada Project

---

NAMA FRAME: CELCIUSTOFAHRENHEITGUI

PACKAGE: GUI





# 3. Menempatkan GUI Component ke Design (Frame)

---

# CelciusToFahrenheit - NetBeans IDE 6.5

File Edit PDF View Navigate Source Refactor Run Debug Profile Versioning Tools Window Help



<default config>



Search (Ctrl+I)

Files Se...

...va CelciusToFahrenheitView.java \*

Source Design

Palette Properties

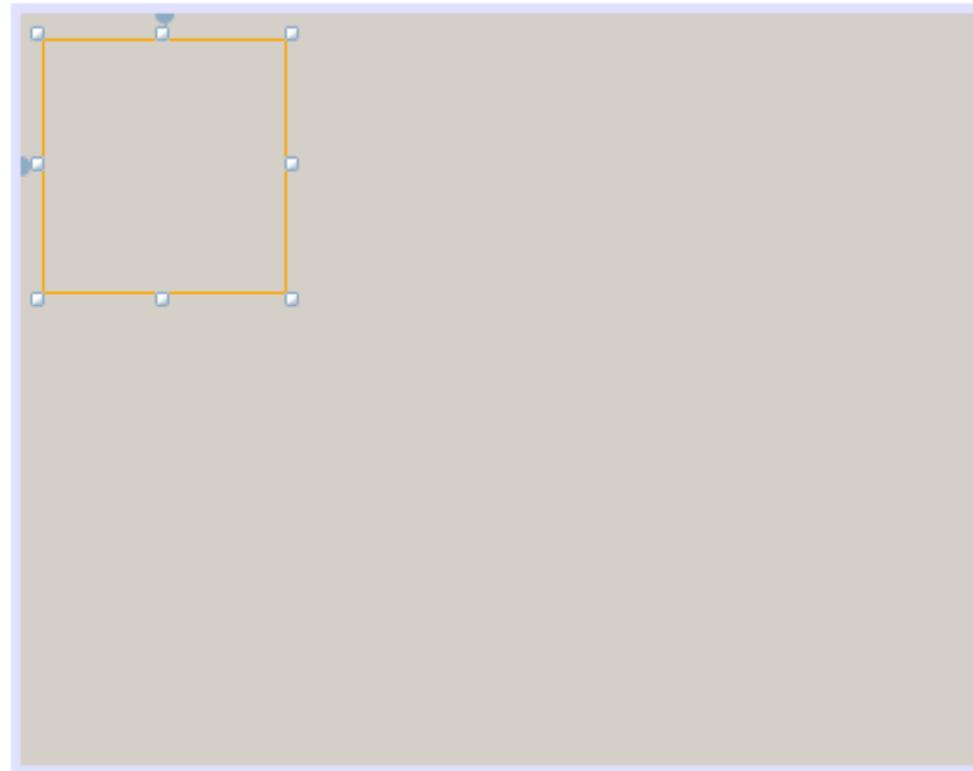
st Packages  
raries  
st Libraries  
Application4  
ses  
orld  
ject3  
tor  
ersiCelciusFahrenheit  
urce Packages

Navigator I...

Form CelciusToFahrenheitView

Other Components  
[JFrame]  
+ JPanel1 [JPanel]

Source Design

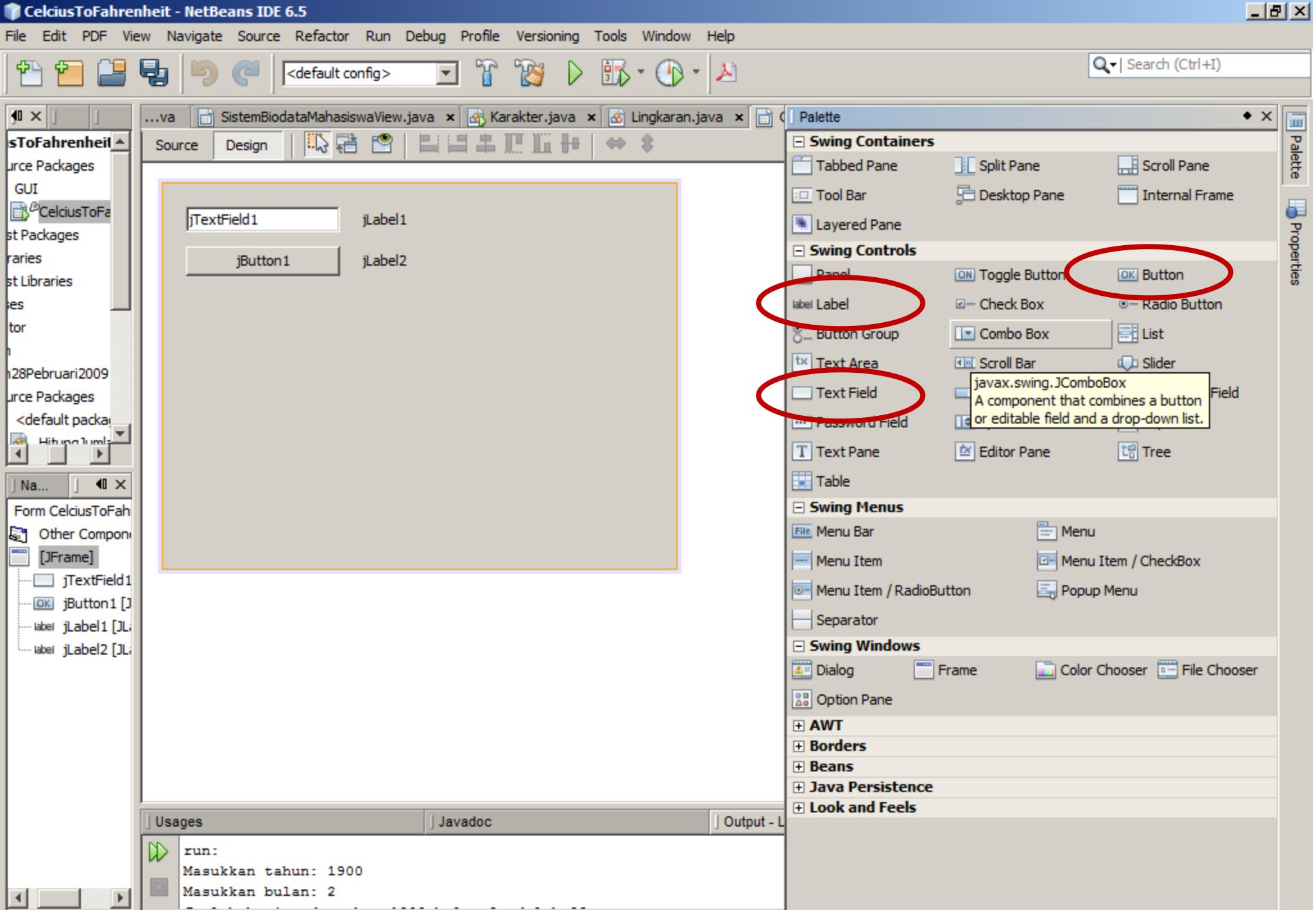


Swing Controls

- Panel
- Toggle Button
- Button
- Label
- Check Box
- Radio Button
- Button Group
- Combo Box
- List
- Text Area
- ScrollBar
- Slider
- Text Field
- ProgressBar

Usages Javadoc Output - Konversi... Tasks

run:  
BUILD SUCCESSFUL (total time: 31 seconds)



## 4. Mengubah Text dari GUI Component (Edit Text)

JTEXTFIELD1: KOSONGI

JLABEL1: CELCIUS

---

JLABEL2: FAHRENHEIT

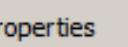
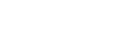
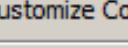
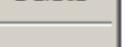
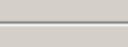
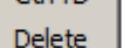
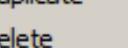
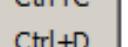
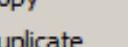
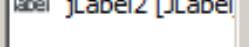
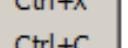
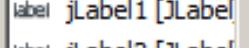
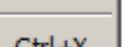
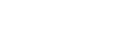
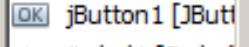
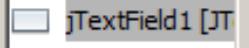
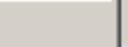
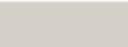
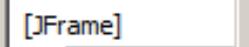
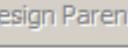
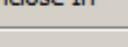
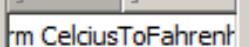
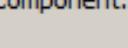
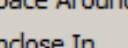
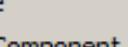
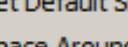
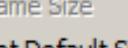
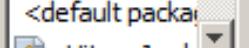
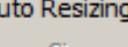
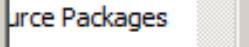
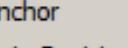
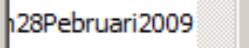
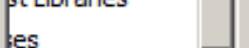
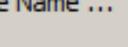
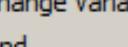
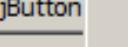
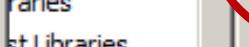
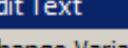
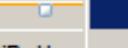
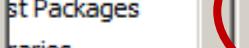
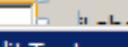
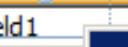
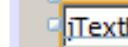
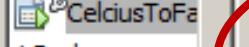
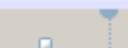
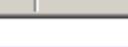
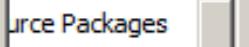
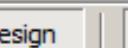
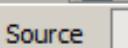
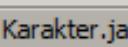
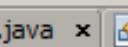
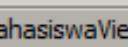
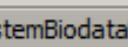
JBUTTON1: CONVERT

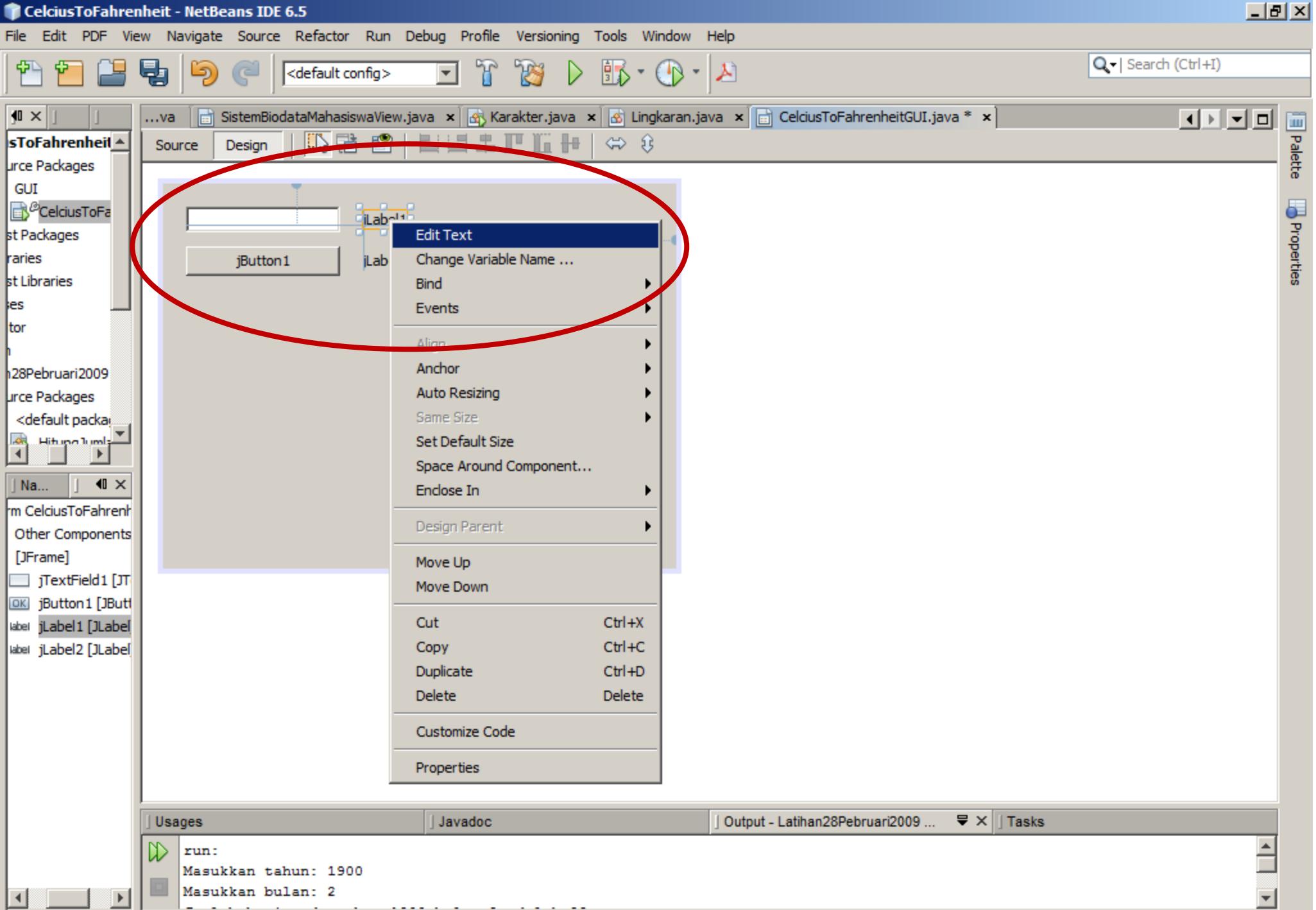


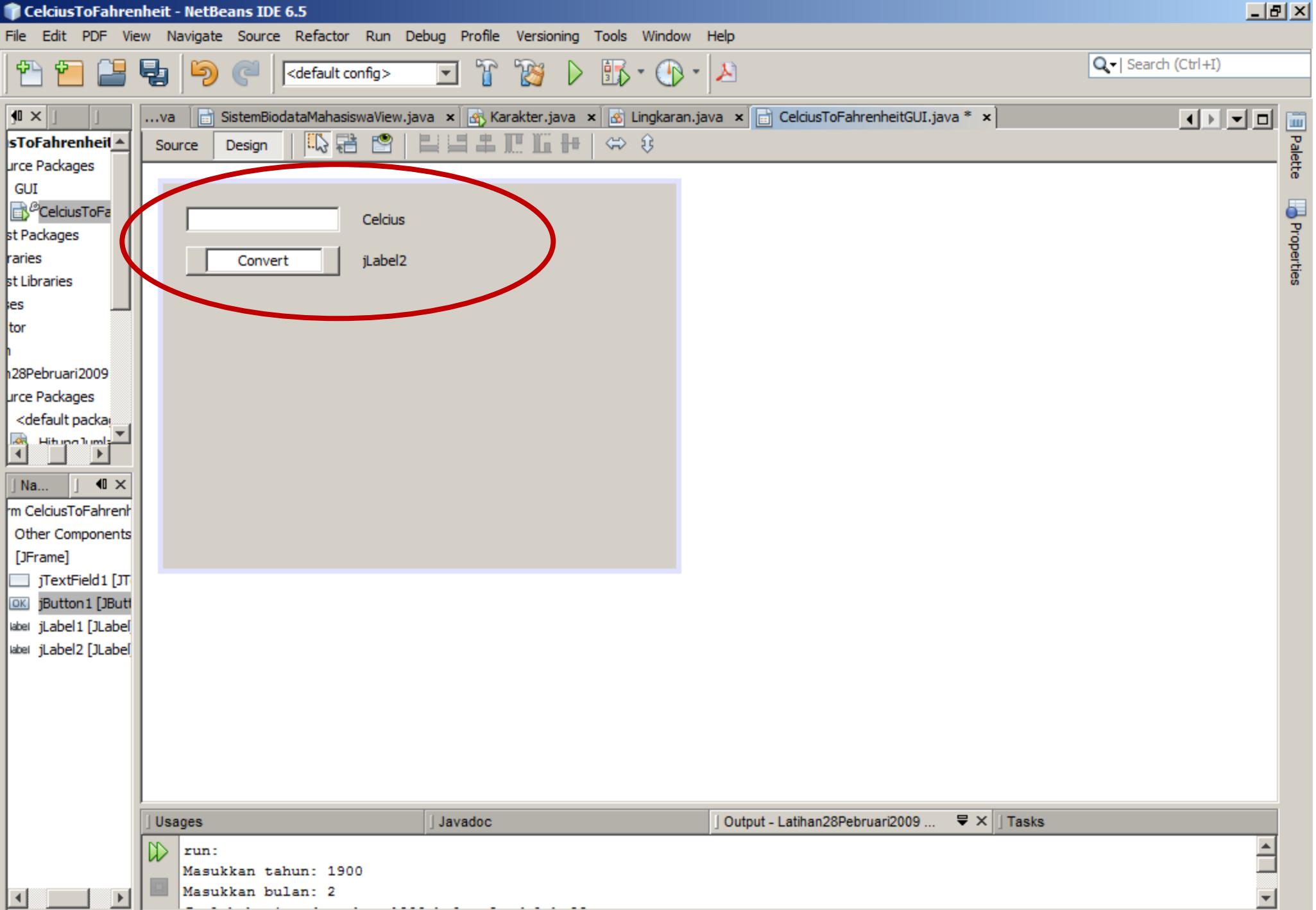
&lt;default config&gt;



Search (Ctrl+I)







## 5. Mengubah Nama Variable dari Setiap GUI Component (Change Variable Name)

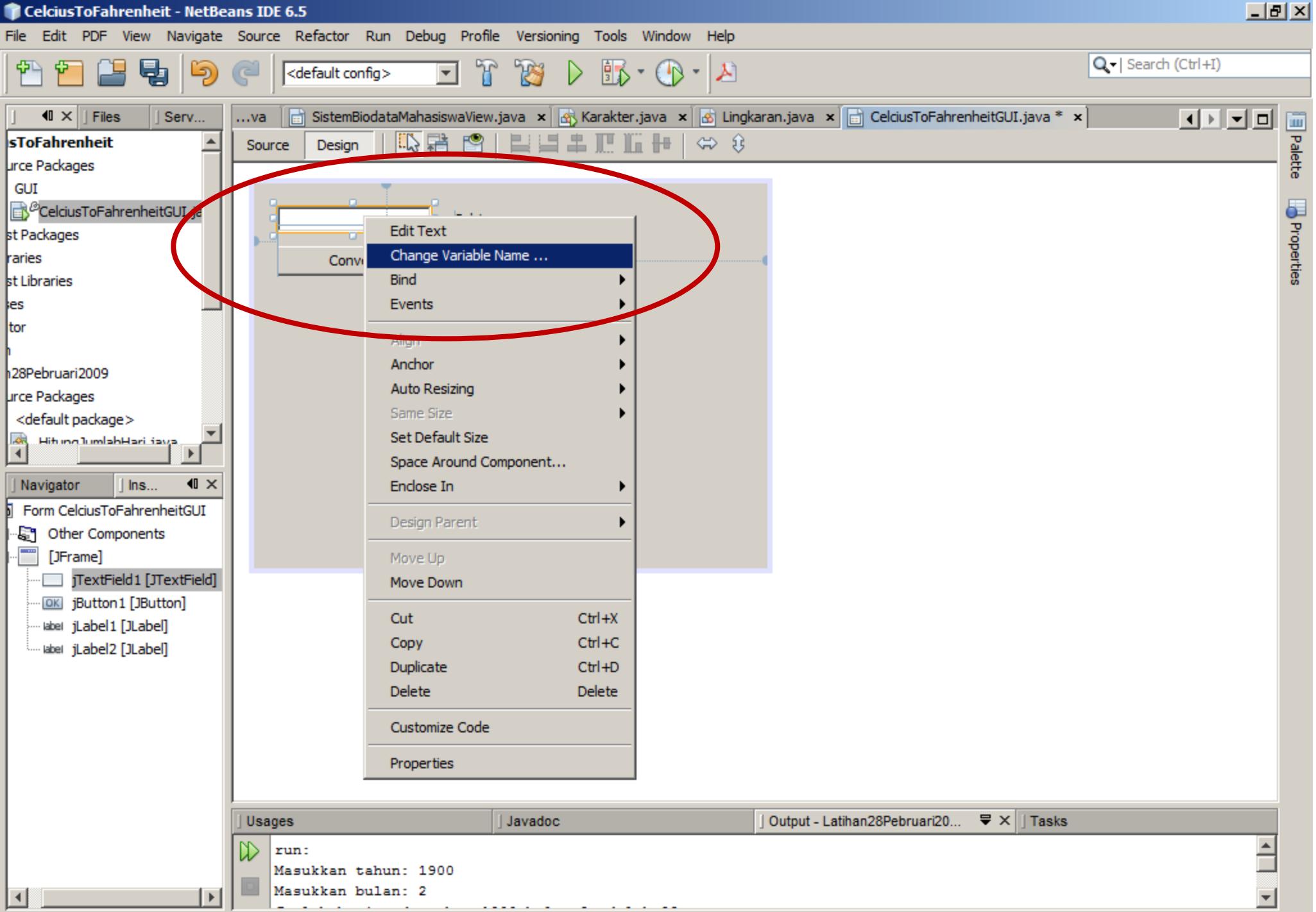
JTEXTFIELD1: CELCIUSTEXTFIELD

JLABEL1: CELCIUSLABEL

---

JLABEL2: FAHRENHEITLABEL

JBUTTON1: CONVERTBUTTON





&lt;default config&gt;



Search (C)

Files Serv...

## sToFahrenheit

Source Packages

GUI

CelciusToFahrenheitGUI.ja

st Packages

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st Libraries

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tor

n

128Pebruari2009

Source Packages

&lt;default package&gt;

HitungJumlahHari.java

Navigator Ins... &lt;&gt; X

## Form CelciusToFahrenheitGUI

Other Components

[JFrame]

jTextField1 [JTextField]

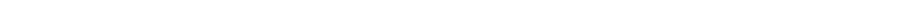
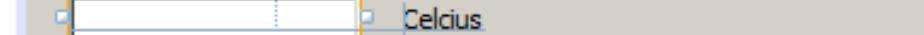
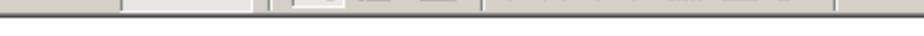
jButton1 [JButton]

label jLabel1 [JLabel]

label jLabel2 [JLabel]

SistemBiodataMahasiswaView.java x Karakter.java x Lingkaran.java x CelciusToFahrenheitGUI.java \*

Source Design

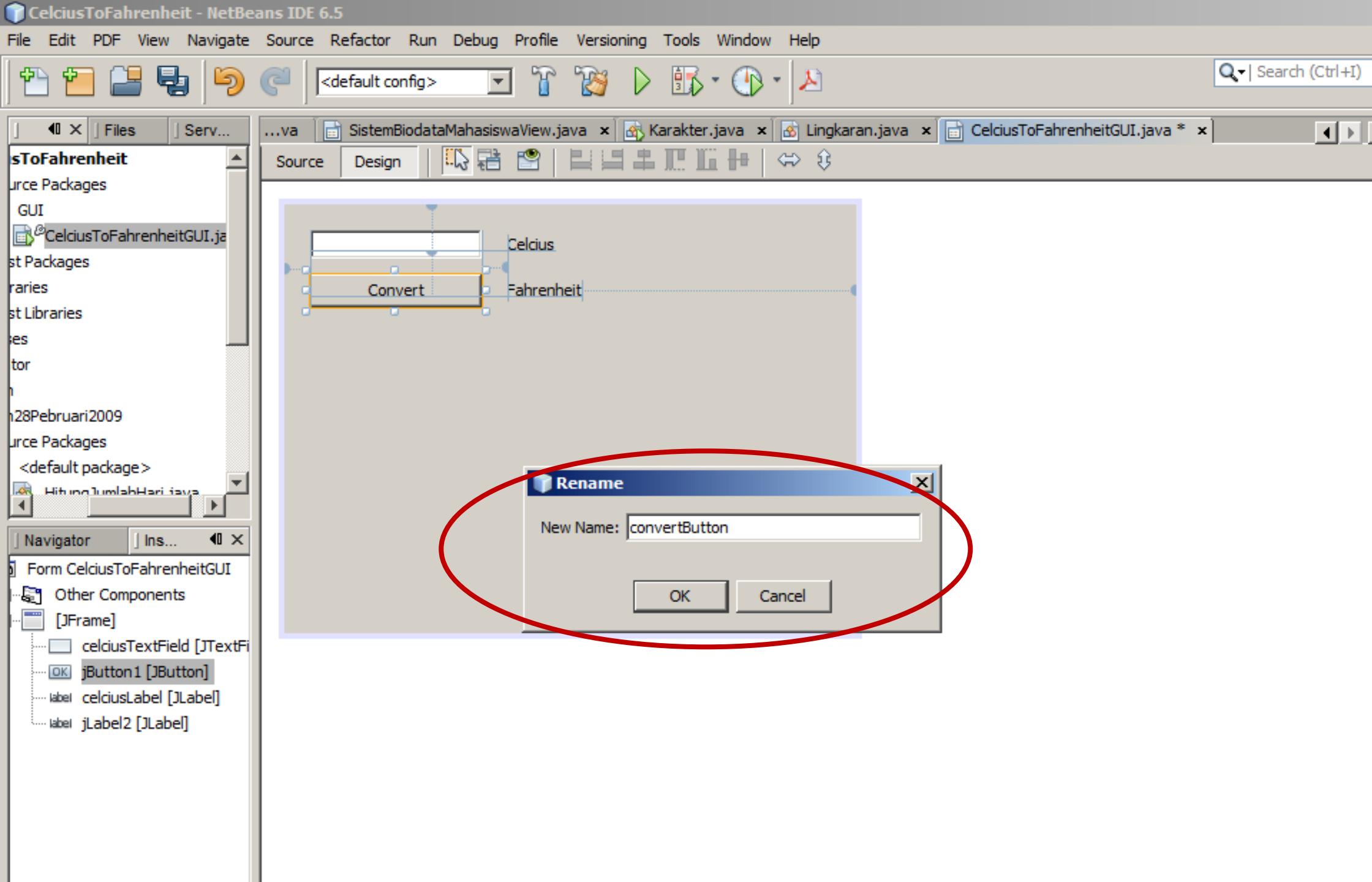


Rename

New Name: celciusTextField

OK

Cancel



## 6. Rapikan Tampilan Frame Program Kita (Potong Yang Tidak Perlu)

---

# CelciusToFahrenheit - NetBeans IDE 6.5

File Edit PDF View Navigate Source Refactor Run Debug Profile Versioning Tools Window Help



<default config>



Files Serv...

## CelciusToFahrenheit

Source Packages

GUI



Test Packages

Varianies

Test Libraries

Issues

Author

1

28Pebruari2009

Source Packages

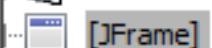
<default package>



Navigator Ins...

Form CelciusToFahrenheitGUI

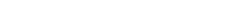
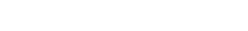
Other Components



- celciusTextField [JTextField]
- convertButton [JButton]
- celciusLabel [JLabel]
- fahrenheitLabel [JLabel]

SistemBiodataMahasiswaView.java Karakter.java Lingkaran.java CelciusToFahrenheitGUI.java

Source Design

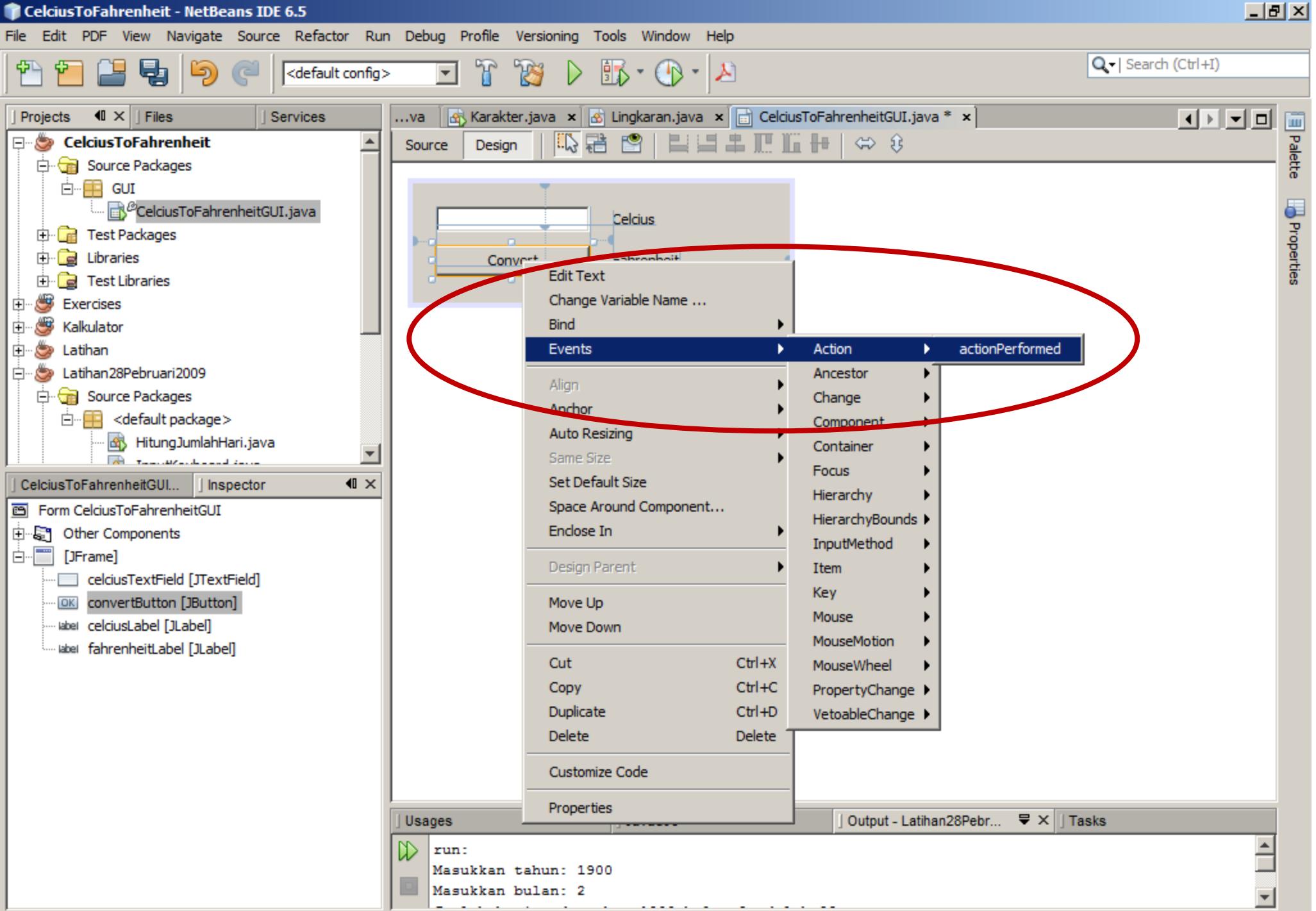


## 7. Buat Event untuk Convert Button

KLIK KANAN PADA CONVERT BUTTON

PILIH EVENT → ACTION → ACTIONPERFOMED

ATAU PILIH EVENT → MOUSE → MOUSECLICK



## 8. Buat Code untuk Event Handling di Convert Button

DOUBLE CELCIUS =

DOUBLE.PARSEDOUBLE(CELCIUSTEXTFIELD.GETTEXT());

DOUBLE FAHRENHEIT = CELCIUS \* 1.8 + 32;

FAHRENHEITLABEL.SETTEXT(FAHRENHEIT + " FAHRENHEIT");

```
22     initComponents();
23 }
24
25 /**
26  * This method is called from within the constructor to
27  * initialize the form.
28  *
29  * WARNING: Do NOT modify this code. The content of this method is
30  * always regenerated by the Form Editor.
31  */
32 @SuppressWarnings("unchecked")
33
34 + Generated Code
35
36
37
38
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83
84 - private void convertButtonActionPerformed(java.awt.event.ActionEvent evt) {
85
86     double fahrenheit = Double.parseDouble(celciusTextField.getText()) * 1.8 + 32;
87     fahrenheitLabel.setText(fahrenheit + " Fahrenheit");
88
89 }
90
91 /**
92  * @param args the command line arguments
93 */
94 public static void main(String args[]) {
```

## 9. Kompilasi (Build, F11) Project

---

File Edit PDF View Navigate Source Refactor Run Debug Profile Versioning Tools Window Help

Run Main Project F6  
Test Project (CelciusToFahrenheit) Alt+F6

Build Main Project F11  
Clean and Build Main Project Shift+F11  
Batch Build Main Project...

Set Project Configuration  
Set Main Project

Generate Javadoc (CelciusToFahrenheit)

Run File Shift+F6  
Test File Ctrl+F6  
Compile File F9

Check File Alt+F9  
Validate File Alt+Shift+F9

Repeat Build/Run: ProgramKonversiSuhu (run)  
Stop Build/Run

```
private double fahr = Double.parseDouble(textField.getText());
        ...
    }

public static void main(String args[]) {
    ...
}
```

87:58 INS

Usages Javadoc Output - ProgramKo... Tasks

run:  
BUILD SUCCESSFUL (total time: 15 seconds)

Start Facebook | ... romi-oop-03... romi-oop-04... romi-oop-05... CelciusToF... 10:46

## 10. Jalankan (Run, F6) Project

---

File Edit PDF View Navigate Source Refactor Run Debug Profile Versioning Tools Window Help

<default config>

Run Main Project F6  
Test Project (CelciusToFahrenheit) Alt+F6  
Build Main Project F11  
Clean and Build Main Project Shift+F11  
Batch Build Main Project...  
Set Project Configuration  
Set Main Project  
Generate Javadoc (CelciusToFahrenheit)  
Run File Shift+F6  
Test File Ctrl+F6  
Compile File F9  
Check File Alt+F9  
Validate File Alt+Shift+F9  
Repeat Build/Run: ProgramKonversiSuhu (run)  
Stop Build/Run

convertButtonActionPerformed

Members View

CelciusToFahrenheitGUI ::

- ↳ CelciusToFahrenheitGUI
- convertButtonActionPerformed
- initComponents()
- main(String[] args)
- celciusLabel : JLabel
- celciusTextField : JTextField
- convertButton : JButton
- fahrenheitLabel : JLabel

87:58 INS

Usages Javadoc Output - ProgramKon... Tasks

run:  
BUILD SUCCESSFUL (total time: 15 seconds)

Bisa Juga dengan Klik  
Kanan dan pilih Run  
Pada File Java

---

