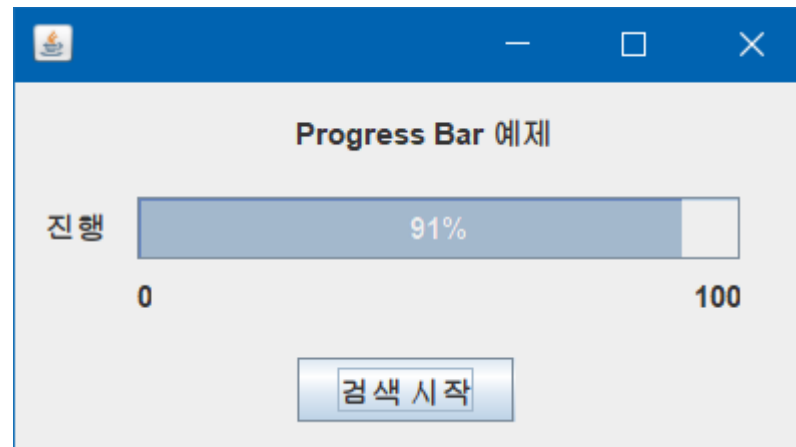




# GUI Control III





# 학습 목표

■ 이 강의를 마치면 학생들은

- ❖ TabbedPane Control 기능에 대하여 설명할 수 있다.
- ❖ Progress Bar Control 기능에 대하여 설명할 수 있다.
- ❖ Slider Control에 대하여 설명할 수 있다.

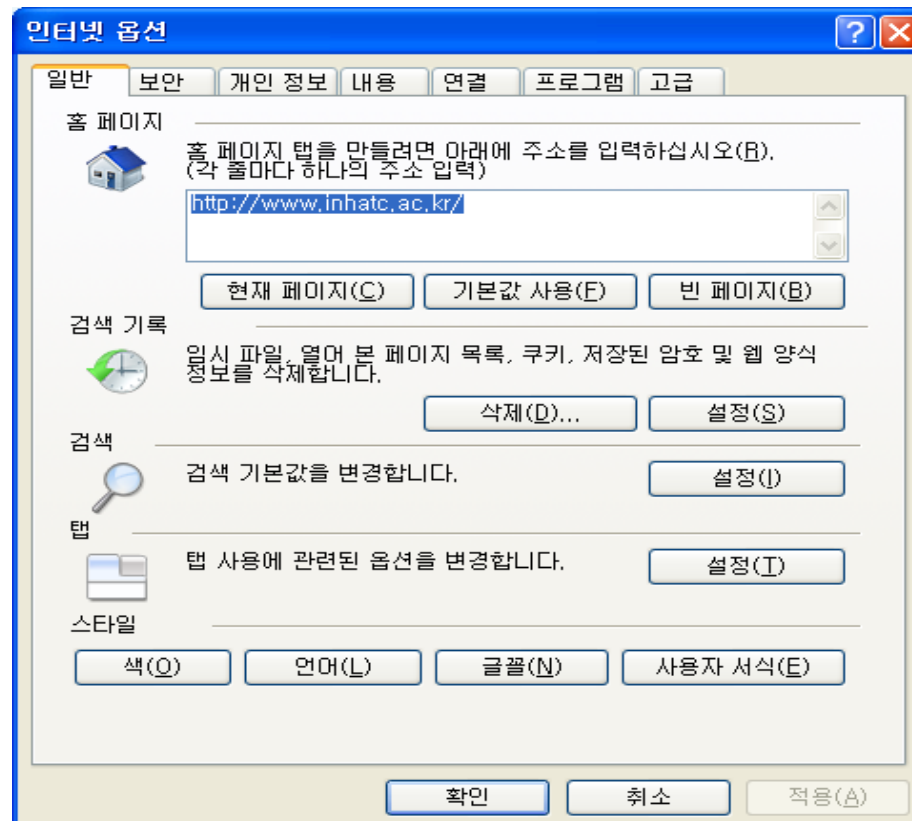




# Tab Control

## ■ Tab Control 기능

❖ 한 화면에 다양한 기능 표현



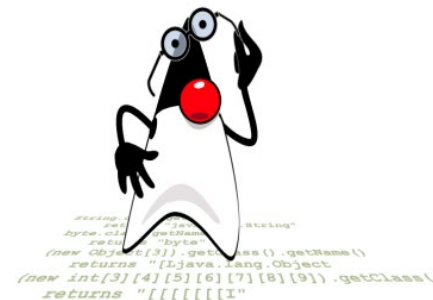
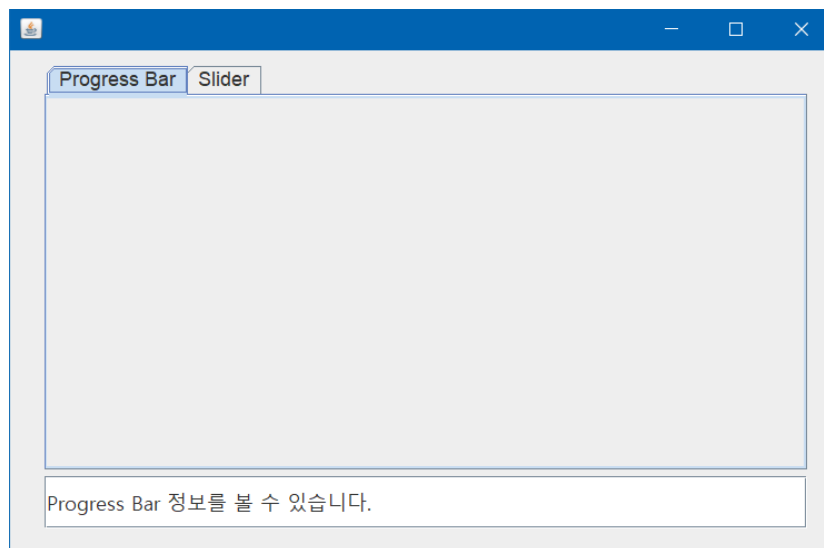


# Practice: Tab Control

❖ Project Name: Tab\_Source(Practice Time : 20 min)

■ TabbedPane 버튼 Click

• Pane의 Title을 상태 정보 출력 TextField에 출력한다.





# Practice 1 : Tab Control (1)

## Create Project

The screenshot shows the Apache NetBeans IDE interface. The 'File' menu is open, and the 'New Project...' option is highlighted. A yellow callout box labeled '1. Click' points to this option. The 'New Project' dialog box is open, showing the 'Steps' section with '1. Choose Project' and '2. ...'. A yellow callout box labeled '2. Click' points to the 'Java Application' option in the 'Projects' list. The 'Java with Ant' category is also highlighted in the 'Categories' list. A yellow callout box labeled '3. Click' points to the 'Next >' button at the bottom of the dialog. The 'Description' section at the bottom of the dialog explains that this creates a new Java SE application.

1. Click

2. Click

3. Click

**Steps**

1. Choose Project
2. ...

**Choose Project**

Filter:

**Categories:**

- Java with Maven
- Java with Gradle
- Java with Ant
- JavaFX
- Java Web
- Java Enterprise
- NetBeans Modules
- HTML5/JavaScript
- C/C++
- PHP

**Projects:**

- Java Application
- Java Class Library
- Java Project with Existing Sources
- Java Modular Project
- Java Free-Form Project

**Description:**

Creates a new Java SE application in a standard IDE project. You can also generate a main class in the project. Standard projects use an IDE-generated Ant build script to build, run, and debug your project.

< Back Next > Finish Cancel Help





# Practice 1 : Tab Control (2)

## ■ Project Name and Location

❖ Project name: Tab\_Source

The screenshot shows the 'New Java Application' dialog box. On the left, the 'Steps' pane lists '1. Choose Project' and '2. Name and Location'. The 'Name and Location' section contains the following fields and options:

- Project Name:** Tab\_Source (Annotated with '4. Input Project Name')
- Project Location:** C:\Java\_Project (with a 'Browse...' button)
- Project Folder:** C:\Java\_Project\Tab\_Source
- ☐ **Use Dedicated Folder for Storing Libraries** (with a 'Browse...' button)
- ☐ **Create Main Class** (Annotated with '5. Reset check'). The text 'tab\_source.Tab\_Source' is visible in the adjacent field.

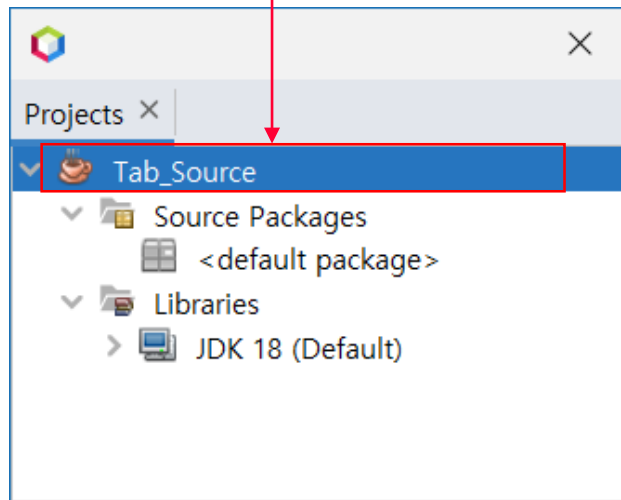
At the bottom, there are four buttons: '< Back', 'Next >', 'Finish' (Annotated with '6. Click'), and 'Cancel'. A 'Help' button is also present on the far right. A small cartoon character is visible in the bottom-left corner of the slide.



# Practice 1 : Tab Control (3)

## Create JFrame Form

7. Mouse right-button Click



New

Build  
Clean and Build  
Close

8. Click

Run  
Debug  
Profile  
Test  
Set Configuration

Set as Main Project  
Open Required Projects  
Close

Rename...  
Move...  
Copy...  
Delete

Find...  
Versioning  
Local History

Properties

JFrame Form...

Java Class...  
Java Package...

Java Main Class...  
Java Class...

JP...  
Entity Class...

Entity Classes from Database...

Other...

9. Click





# Practice 1 : Tab Control (4)

## ■ Setting JFrame Form Name

### ❖ Create MainFrame.java

**New JFrame Form**

**Steps**

1. Choose File Type
2. Name and Location

**Name and Location**

Class Name: MainFrame

Project: Tab\_Source

Location: Source Packages

Package:

Created File: C:\Java\_Project\Tab\_Source\src\MainFrame.java

Superclass: Browse...

Interfaces: Browse...

10. Input "MainFrame"

11. Click

Warning: It is highly recommended that you do not place Java classes in the default package

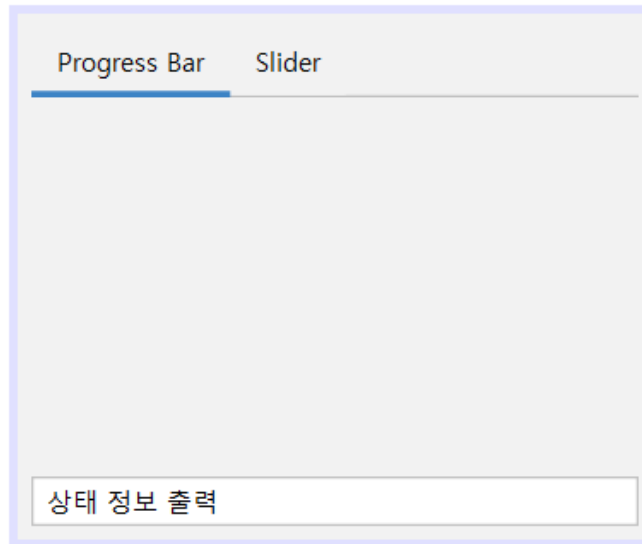
< Back Next > Finish Cancel Help





# Practice 1 : Tab Control (5)

## Control Layout & Property Setting



12. UI Design

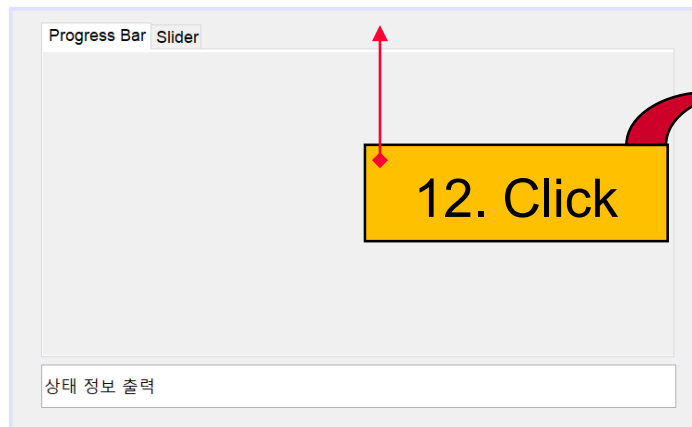
Control	Properties Setting
jTabbedPane1	
jPanel1	<ul style="list-style-type: none"><li>• Tab Title: ProgressBar</li></ul>
jPanel2	<ul style="list-style-type: none"><li>• Tab Title: Slider</li></ul>
jTextField1	<ul style="list-style-type: none"><li>• Variable Name: txtStateInfo</li><li>• Text: 상태 정보 출력</li></ul>



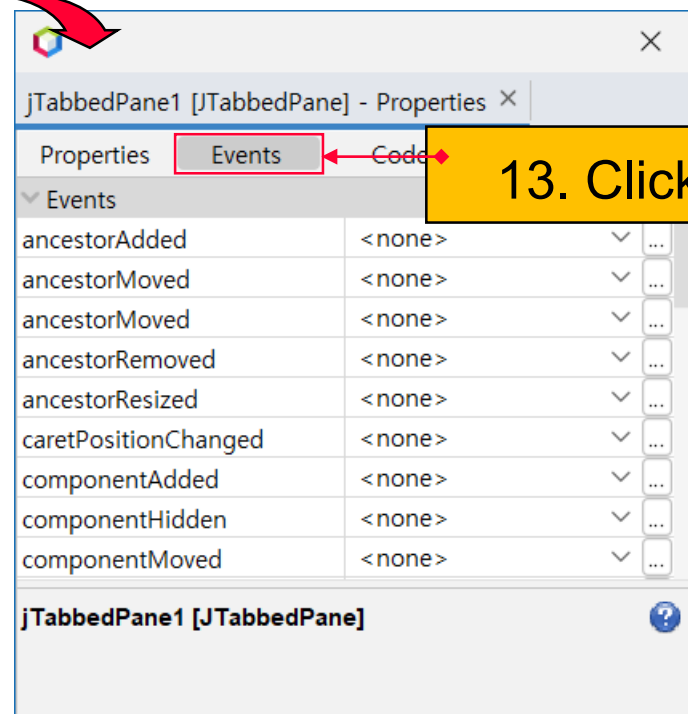


# Practice 1 : Tab Control (6)

## ■ jTabbedPane1 Control Event 지정



12. Click



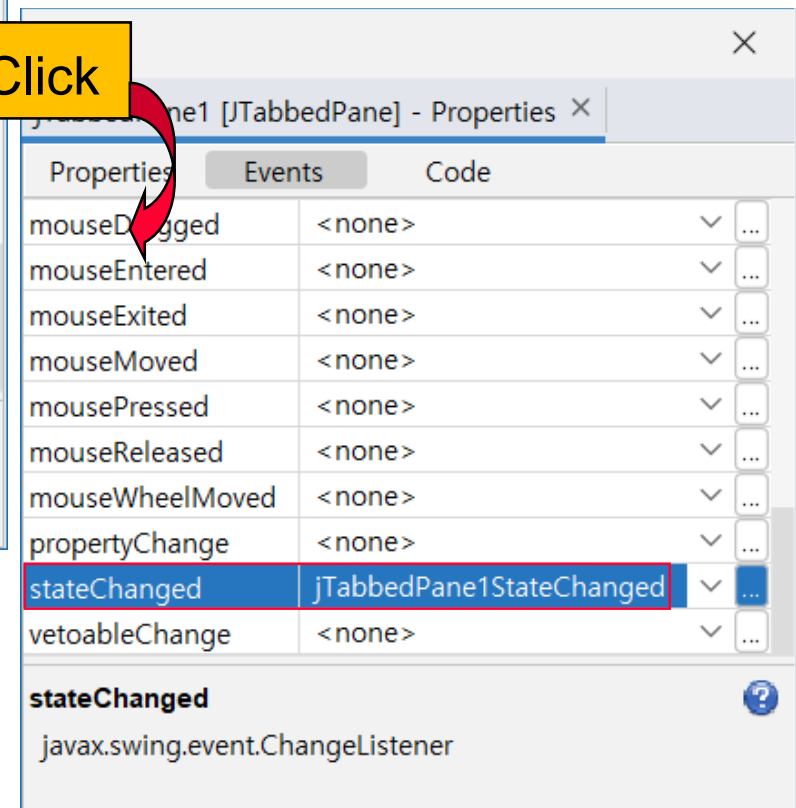
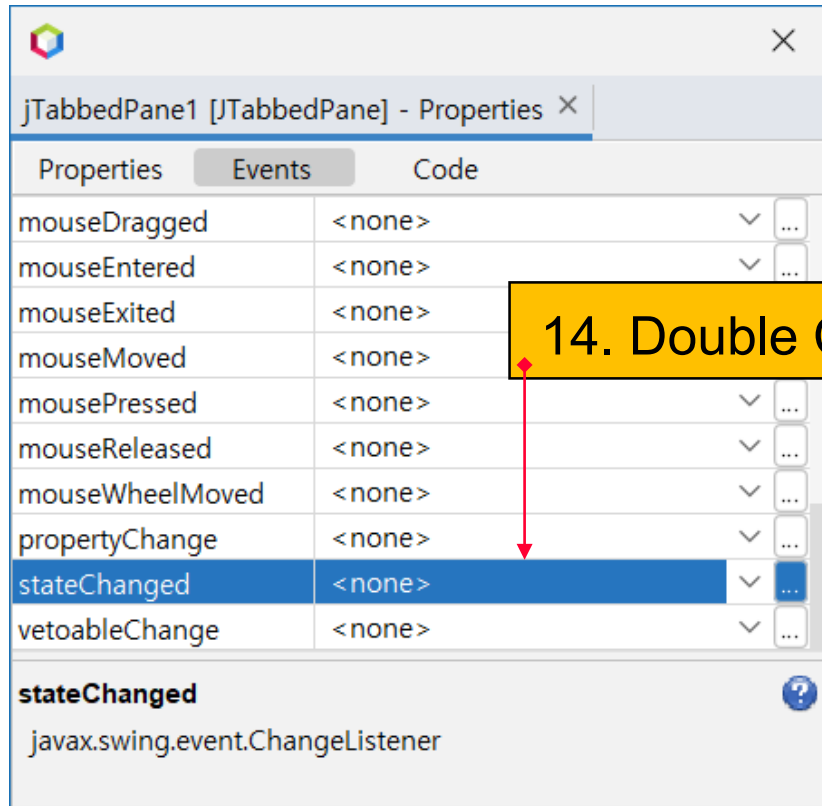
13. Click





# Practice 1 : Tab Control (7)

## ■ JTabbedPane1 Control StateChanged() Event 지정





# Practice 1 : Tab Control (8)

## ❖ jTablebedPane1StateChanged() Event Handler

```
MainFrame.java - Editor
MainFrame.java x
18 }
76
77
78
79
80
81
82 /**
83  * @param args the command line arguments
84  */
85 public static void main(String args[]) {
86     java.awt.EventQueue.invokeLater(new Runnable() {
87         public void run() {
88             new MainFrame().setVisible(true);
89         }
90     });
91 }
```

```
private void jTablebedPane1StateChanged(javax.swing.event.ChangeEvent evt) {
    int iTabinde = 0; // jTablebedPane1 index 저장
    String strTabTitle = null; // jTablebedPane1 Title 저장

    iTabinde = jTablebedPane1.getSelectedIndex(); // jTablebedPane1 index 반환
    strTabTitle = jTablebedPane1.getTitleAt(iTabindex); // jTablebedPane1 Title 반환
    txtStateInfo.setText( strTabTitle + " 정보를 볼 수 있습니다.");
}

/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    java.awt.EventQueue.invokeLater(new Runnable() {
        public void run() {
            new MainFrame().setVisible(true);
        }
    });
}
```

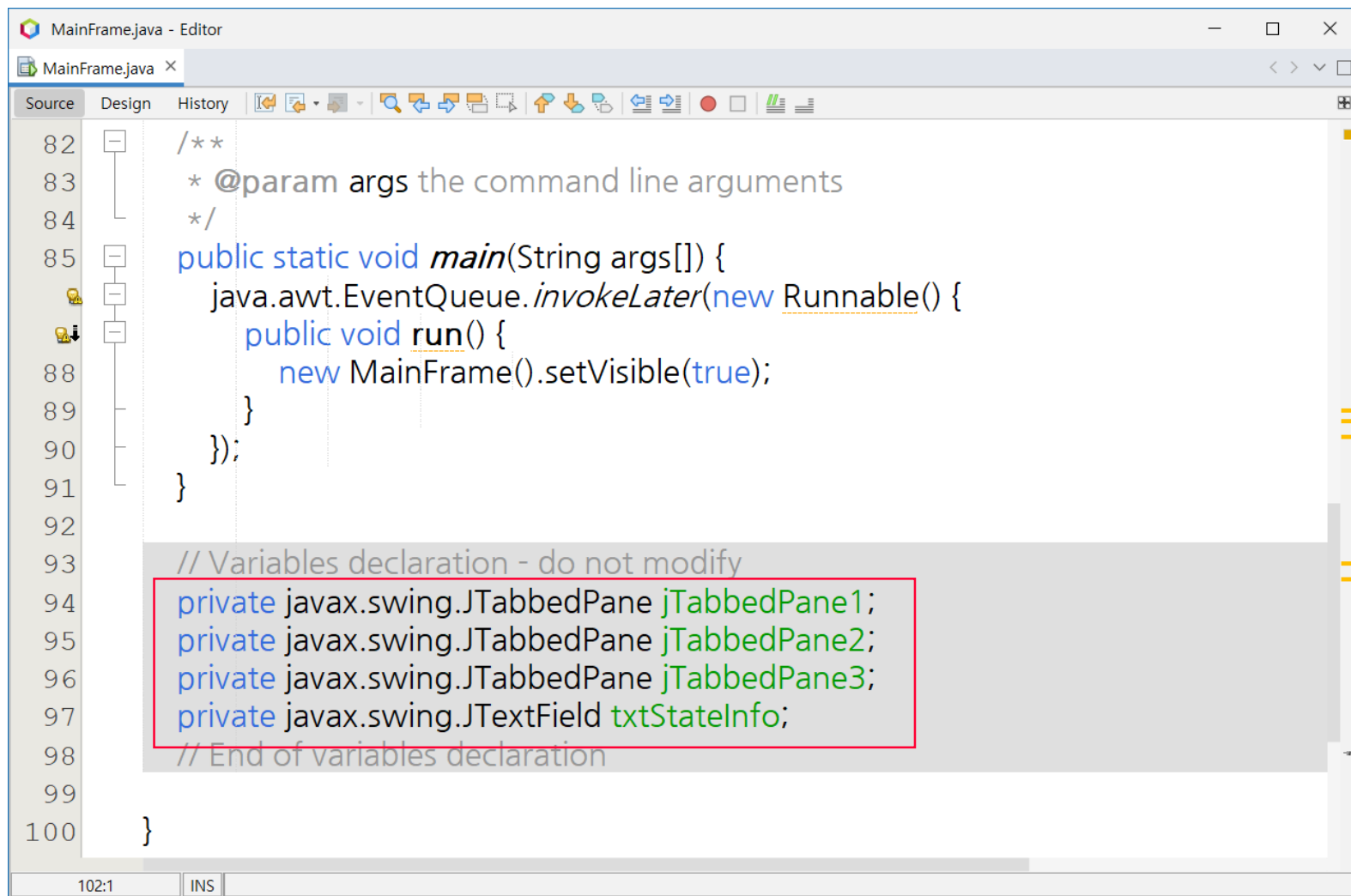
15. Coding





# Practice: Tab Control (9)

## ❖ JTabbedPane Control Declaration Code



```
82  /**
83   * @param args the command line arguments
84   */
85  public static void main(String args[]) {
86      java.awt.EventQueue.invokeLater(new Runnable() {
87          public void run() {
88              new MainFrame().setVisible(true);
89          }
90      });
91  }
92
93  // Variables declaration - do not modify
94  private javax.swing.JTabbedPane jTabbedPane1;
95  private javax.swing.JTabbedPane jTabbedPane2;
96  private javax.swing.JTabbedPane jTabbedPane3;
97  private javax.swing.JTextField txtStateInfo;
98  // End of variables declaration
99
100 }
```





# Practice 1 : Tab Control (10)

## ❖ JTabbedPane Control Properties Setting Code

```
MainFrame.java - Editor
MainFrame.java x
Source Design History
25 // <editor-fold defaultstate="collapsed" desc="Generated Code">
26 private void initComponents() {
27
28     jTabbedPane1 = new javax.swing.JTabbedPane();
29     jTabbedPane2 = new javax.swing.JTabbedPane();
30     jTabbedPane3 = new javax.swing.JTabbedPane();
31     txtStateInfo = new javax.swing.JTextField();
32
33     setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
34
35     jTabbedPane1.addChangeListener(new javax.swing.event.ChangeListener() {
36         public void stateChanged(javax.swing.event.ChangeEvent evt) {
37             jTabbedPane1StateChanged(evt);
38         }
39     });
40     jTabbedPane1.addTab("Progress Bar", jTabbedPane2);
41     jTabbedPane2.setAccessibleContext().setAccessibleParent(this);
42
43     jTabbedPane1.addTab("Slider", jTabbedPane3);
44
45     txtStateInfo.setText("상태 정보 출력");
46 }
```

101:1

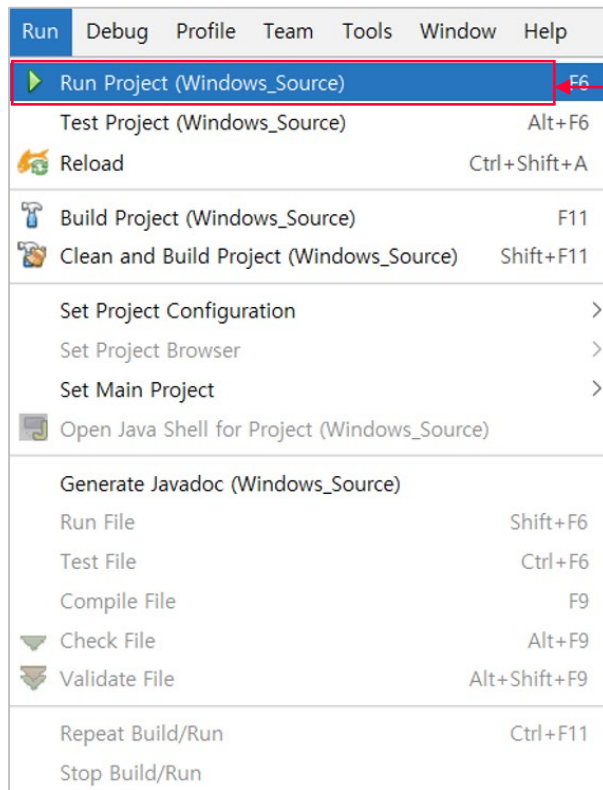
INS A breakpoint cannot be set at this location.



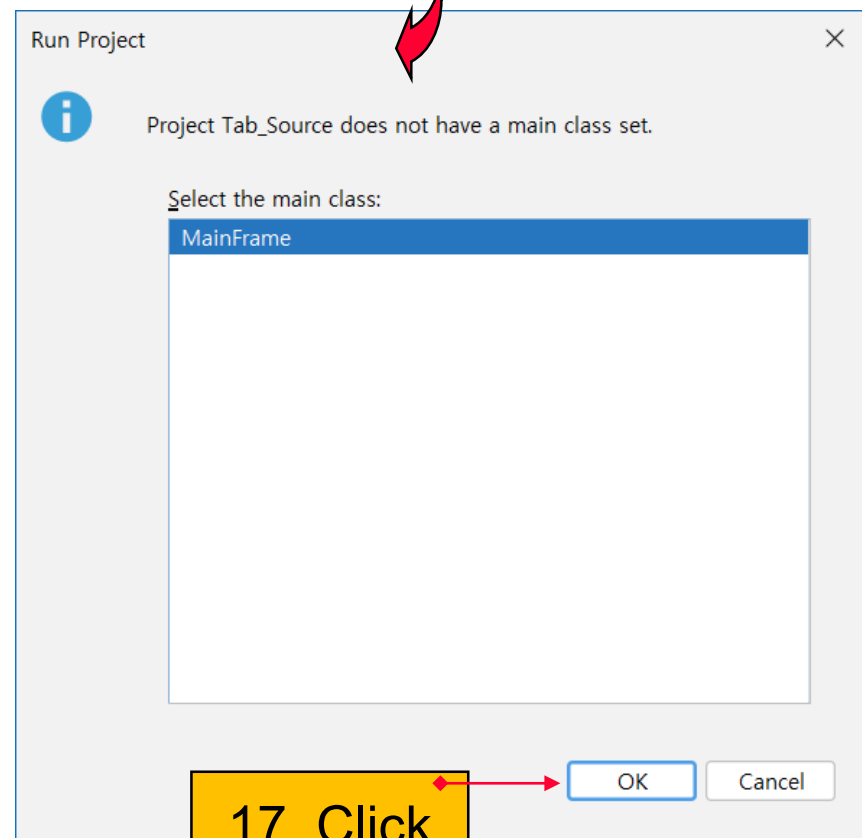


# Practice 1 : Tab Control (11)

## Run



16. Click



17. Click

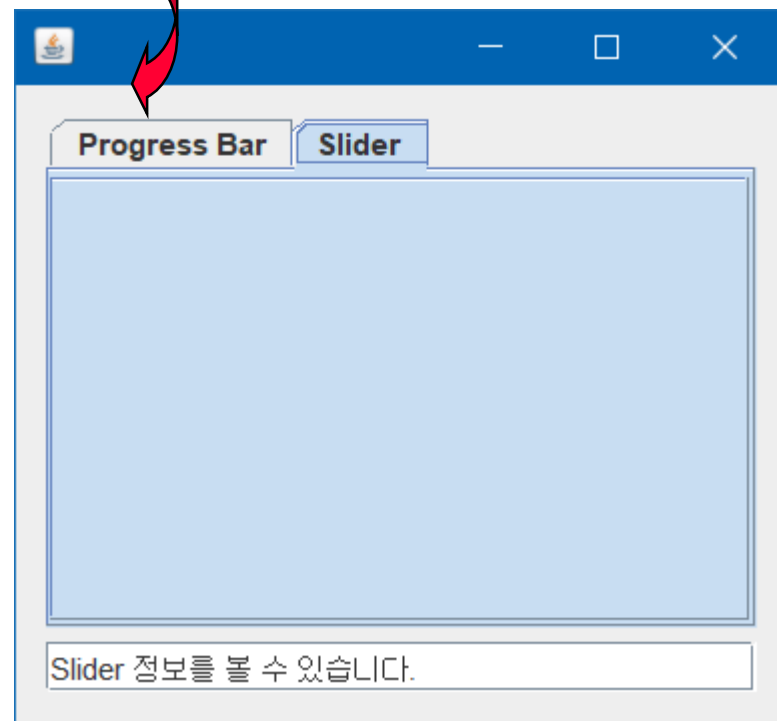
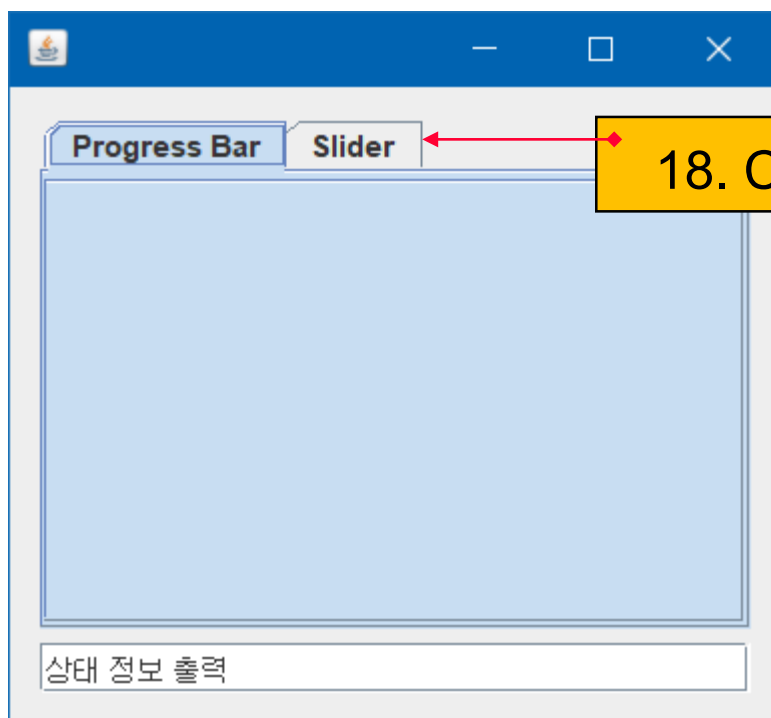




# Practice 1 : Tab Control (12)

■ Run

❖ Tab Click



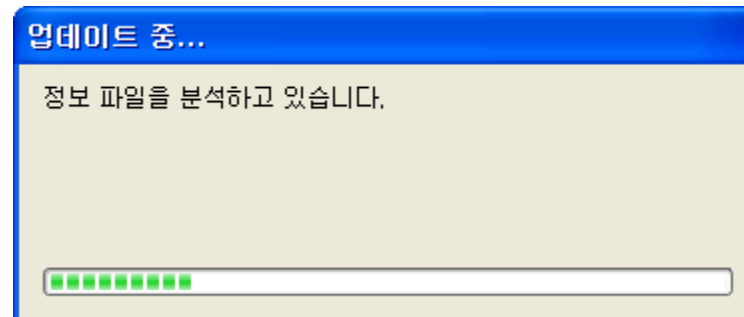




# Progress Bar Control

## ■ ProgressBar Control 기능

### ❖ 작업 진행 상태 표현

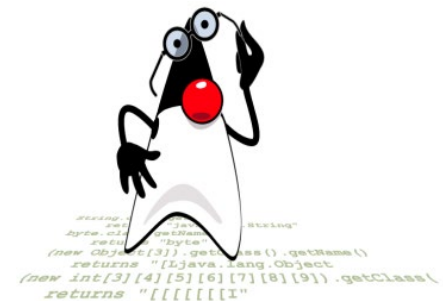
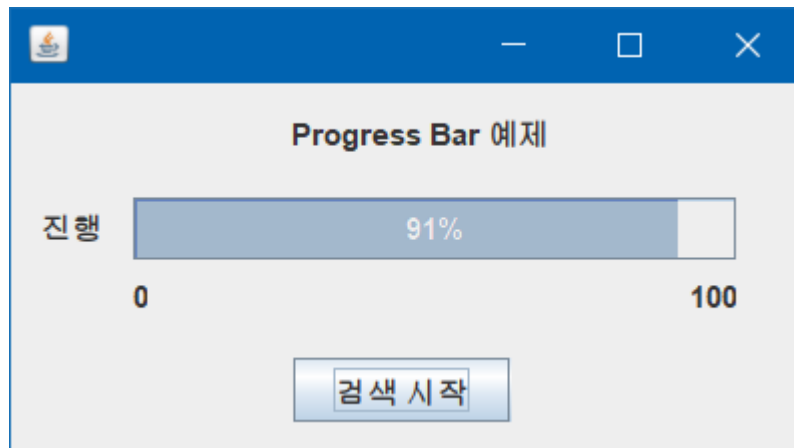




# Practice 2 : Progress Bar Control

## ❖ Project Name: ProgressBar\_Source(Time : 20 min)

- [검색 시작] Button Click
  - 진행 상태를 Progress Bar에 나타낸다.





# Practice 2 : Progress Bar Control (1)

## Create Project

The screenshot shows the Apache NetBeans IDE interface. The 'File' menu is open, and 'New Project...' is highlighted. A yellow callout '1. Click' points to this menu item. The 'New Project' dialog box is open, showing the 'Choose Project' tab. The 'Java with Ant' category is selected, and 'Java Application' is highlighted in the 'Projects' list. A yellow callout '2. Click' points to 'Java Application'. At the bottom of the dialog, the 'Next >' button is highlighted, with a yellow callout '3. Click' pointing to it. The 'Description' section at the bottom of the dialog explains that this creates a new Java SE application.

**1. Click**

**2. Click**

**3. Click**

**Steps**

1. Choose Project
2. ...

**Choose Project**

Filter:

**Categories:**

- Java with Maven
- Java with Gradle
- Java with Ant
- JavaFX
- Java Web
- Java Enterprise
- NetBeans Modules
- HTML5/JavaScript
- C/C++
- PHP

**Projects:**

- Java Application
- Java Class Library
- Java Project with Existing Sources
- Java Modular Project
- Java Free-Form Project

**Description:**

Creates a new **Java SE application** in a standard IDE project. You can also generate a main class in the project. Standard projects use an **IDE-generated Ant build script** to build, run, and debug your project.

< Back Next > Finish Cancel Help





# Practice 2 : Progress Bar Control (2)

## ■ Project Name and Location

❖ Project name: ProgressBar\_Source

New Java Application

**Steps**

1. Choose Project
2. **Name and Location**

**Name and Location**

Project Name: ProgressBar\_Source

Project Location: C:\Java\_Project Browse...

Project Folder: C:\Java\_Project\ProgressBar\_Source

☐ Use Dedicated Folder for Storing Libraries

Libraries Folder: Browse...

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

☐ Create Main Class progressbar\_source.ProgressBar\_Source

< Back Next > Finish Cancel Help

4. Input Project Name

5. Reset check

6. Click

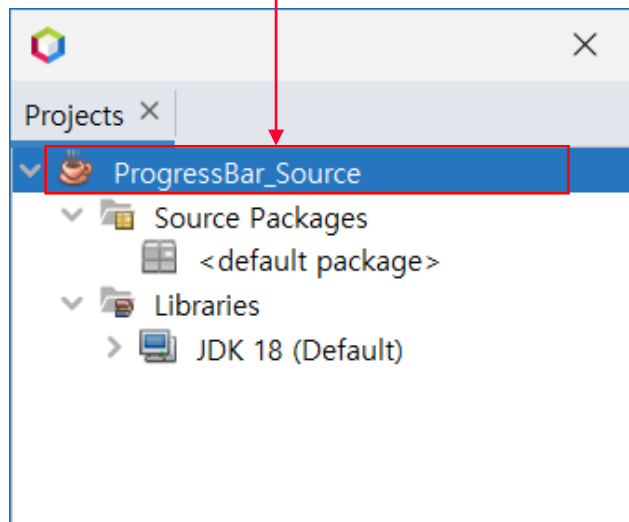




# Practice 2 : Progress Bar Control (3)

## Create JFrame Form

7. Mouse right-button Click



New

Build  
Clean and Build

8. Click

Run  
Debug  
Profile  
Test  
Set Configuration

Alt+F6

Set as Main Project  
Open Required Projects  
Close

Rename...  
Move...  
Copy...  
Delete

Delete

Find...  
Versioning  
Local History

Ctrl+F

Properties

9. Click

JFrame Form...

Java Class...

Java Package...

Java Main Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...

Java Class...



# Practice 2 : Progress Bar Control (4)

## ■ Setting JFrame Form Name

### ❖ Create MainFrame.java

**New JFrame Form**

**Steps**

1. Choose File Type
2. Name and Location

**Name and Location**

Class Name: MainFrame

Project: ProgressBar\_Source

Location: Source Packages

Package:

Created File: C:\Java\_Project\ProgressBar\_Source\src\MainFrame.java

Superclass: Browse...

Interfaces: Browse...

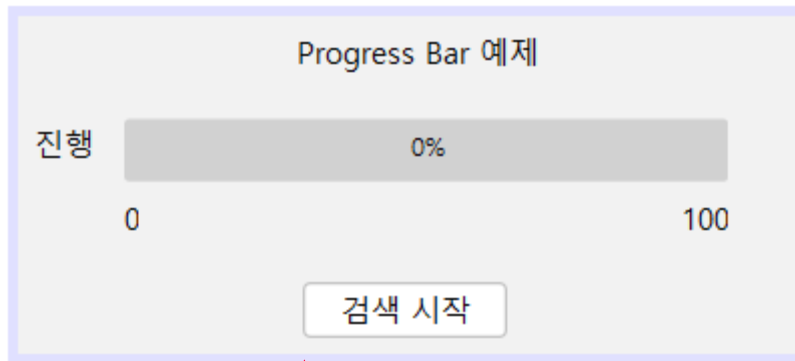
Warning: It is highly recommended that you do not place Java classes in the default package

< Back Next > Finish Cancel Help



# Practice 2 : Progress Bar Control (5)

## Control Layout & Property Setting



### 12. UI Design

Control	Properties Setting
jProgressBar	<ul style="list-style-type: none"><li>• maximum: 100</li><li>• minimum: 0</li><li>• borderPainted: <input checked="" type="checkbox"/></li><li>• string: 0%</li><li>• stringPainted: <input checked="" type="checkbox"/></li></ul>

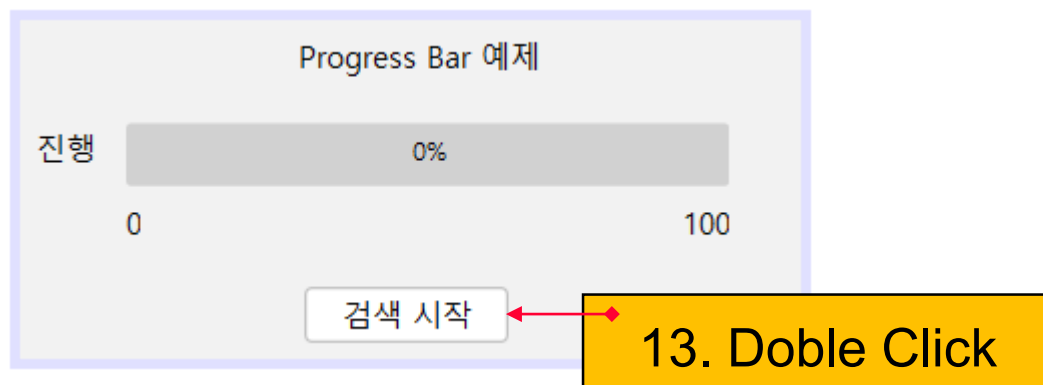
Control	Properties Setting
jLabel1	<ul style="list-style-type: none"><li>• Variable Name: lblTitle</li><li>• Text: Progress Bar 예제</li></ul>
jLabel2	<ul style="list-style-type: none"><li>• Variable Name: lblProgress</li><li>• Text: 진행</li></ul>
jLabel3	<ul style="list-style-type: none"><li>• Variable Name: lblStartVal</li><li>• Text: 0</li></ul>
jLabel4	<ul style="list-style-type: none"><li>• Variable Name: lblEndVal</li><li>• Text: 100</li></ul>
jButton1	<ul style="list-style-type: none"><li>• Variable Name: btnSearch</li><li>• Text: 검색 시작</li></ul>





# Practice 2 : Progress Bar Control (6)

## ■ btnSearchActionPerformed() Event Handler Setting

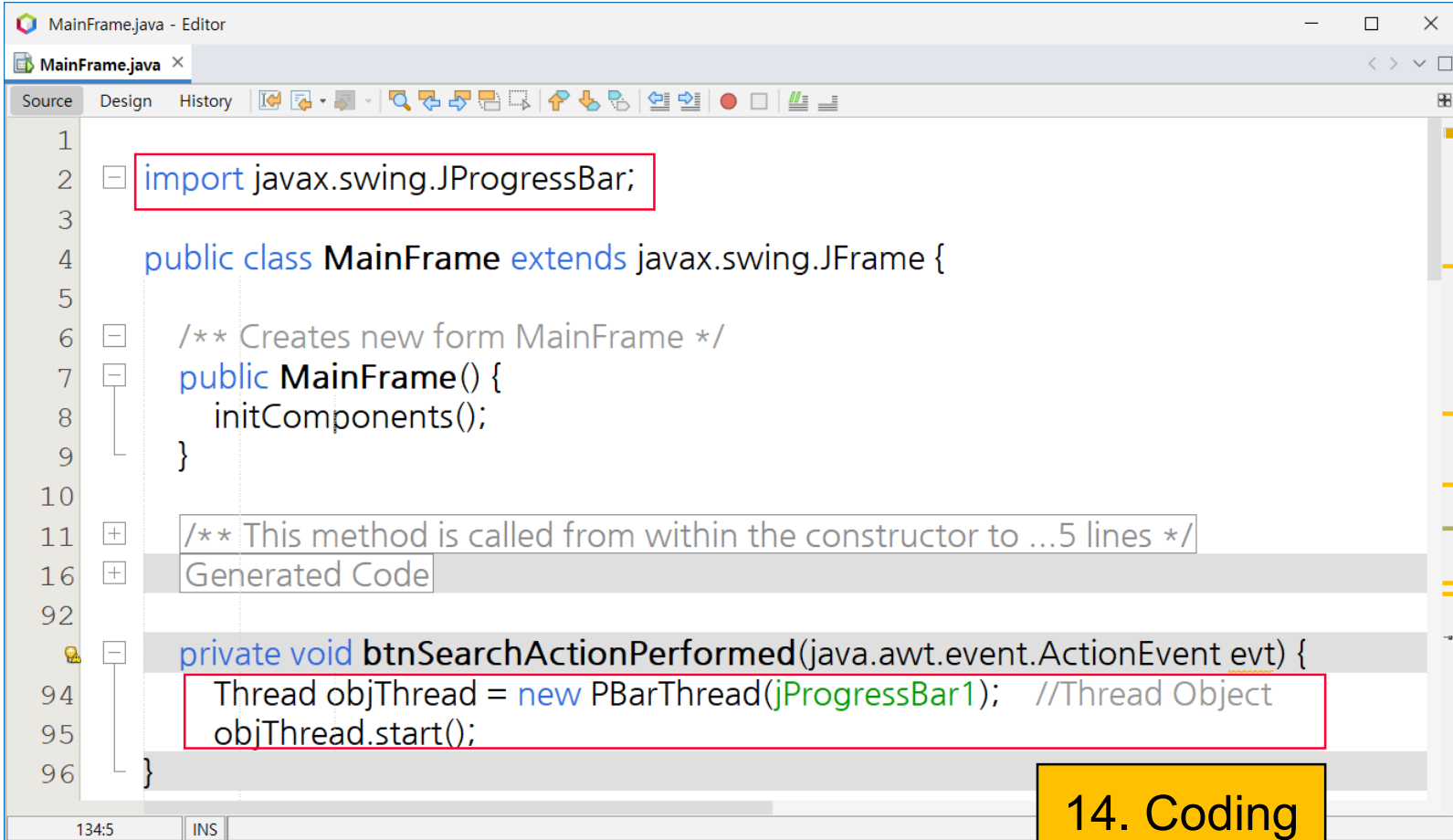






# Practice 2 : Progress Bar Control (7)

## ❖ btnSearchActionPerformed() Event Handler



```
1
2 import javax.swing.JProgressBar;
3
4 public class MainFrame extends javax.swing.JFrame {
5
6     /** Creates new form MainFrame */
7     public MainFrame() {
8         initComponents();
9     }
10
11     /** This method is called from within the constructor to ...5 lines */
12     Generated Code
13
14     private void btnSearchActionPerformed(java.awt.event.ActionEvent evt) {
15         Thread objThread = new PBarThread(jProgressBar1); //Thread Object
16         objThread.start();
17     }
18 }
```

134:5 INS

14. Coding





# Practice 2 : Progress Bar Control (8)

## ❖ Progress BarThread

15. Coding

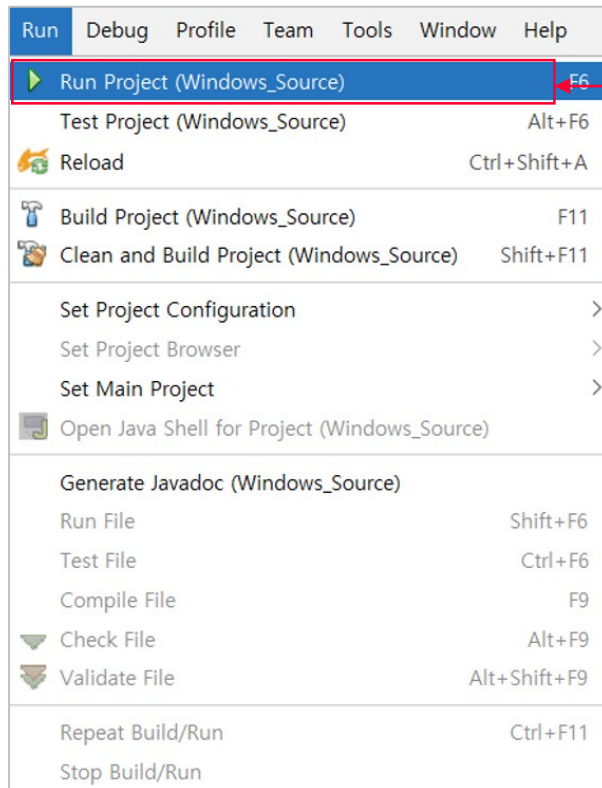
```
98 //Inner Class PBarThread
99 public class PBarThread extends Thread {
100     final static int DELAY = 500; //Thread delay 0.5 second
101     JProgressBar objProgressBar;
102
103     //Constructor
104     public PBarThread(JProgressBar objPB) {
105         objProgressBar = objPB;
106         objProgressBar.setStringPainted(true); //Show ProgressBar Value
107     }
108
109     public void run() {
110         int minValue = objProgressBar.getMinimum(); //ProgressBar.minimum value
111         int maxValue = objProgressBar.getMaximum(); //ProgressBar.maximum value
112
113         for (int idx = minValue; idx < maxValue; idx++) {
114             try {
115                 int iValue = objProgressBar.getValue();
116                 objProgressBar.setValue(iValue + 1); //Setting jProgressBar Value
117                 Thread.sleep(DELAY); //Thread Sleep
118             } catch (InterruptedException ignoredException) {
119             }
120         } //end of for loop
121     } //end of run() method
122 } //end of PBarThread Class
```



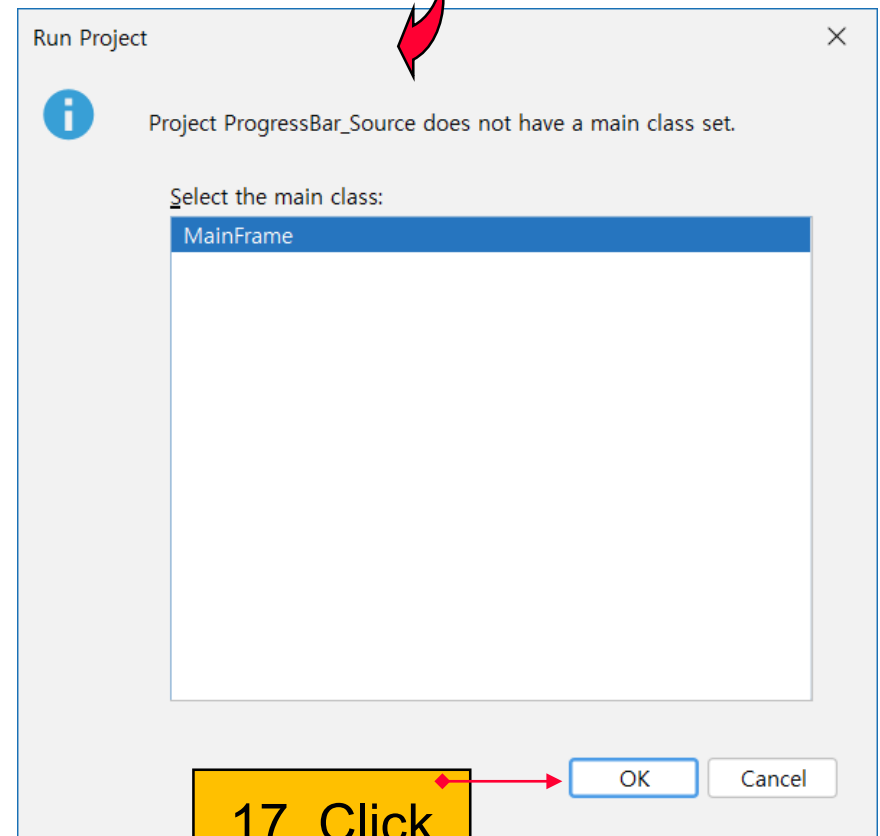


# Practice 2 : Progress Bar Control (9)

## Run



16. Click



17. Click





# Practice 2 : Progress Bar Control (10)

■ Run

❖ [검색 시작] button Click

The application window titled "Progress Bar 예제" contains a progress bar control. The progress bar has a label "진행" (Progress) on the left and numerical values "0" and "100" at the bottom. A button labeled "검색 시작" (Start Search) is located below the progress bar.

18. Click

The first screenshot shows the initial state where the progress bar is empty (0%).

The second screenshot shows the progress bar filled to 91% after the "검색 시작" button is clicked.

The third screenshot shows the progress bar filled to 100% after the "검색 시작" button is clicked again.





# Slider Control

## ■ Slider Control 기능

### ❖ 값 조정 및 진행 상태 표현





- Slider 조정

- 
- A cartoon character with a large red nose and wide eyes, looking surprised or excited, standing on a background of Java code. The code includes comments like "Printing...", "new", "Byte", "Object", and "String", along with a series of array indices [4] [5] [6] [7] [8] [9] and a return statement.





# Practice 3 : Slider Control (1)

## Create Project

The screenshot shows the Apache NetBeans IDE interface. The 'File' menu is open, and 'New Project...' is highlighted. A yellow callout box labeled '1. Click' points to this menu item. The 'New Project' dialog box is open, showing the 'Steps' section with '1. Choose Project' and '2. ...'. The 'Choose Project' section has a 'Filter:' field and a list of 'Categories'. 'Java with Ant' is selected. A yellow callout box labeled '2. Click' points to 'Java Application' in the 'Projects:' list. The 'Description:' section at the bottom explains that it creates a new Java SE application. A yellow callout box labeled '3. Click' points to the 'Next >' button at the bottom right of the dialog.

1. Click

2. Click

3. Click





# Practice 3 : Slider Control (2)

## ■ Project Name and Location

❖ Project name: Slider\_Source

The screenshot shows the 'New Java Application' dialog box. On the left, the 'Steps' pane lists '1. Choose Project' and '2. Name and Location'. The 'Name and Location' section contains the following fields and options:

- Project Name:** Slider\_Source (Annotated with '4. Input Project Name')
- Project Location:** C:\Java\_Project (with a 'Browse...' button)
- Project Folder:** C:\Java\_Project\Slider\_Source
- ☐ **Use Dedicated Folder for Storing Libraries**
- Libraries Folder:** (with a 'Browse...' button)
- ☐ **Create Main Class** slider\_source.Slider\_Source (Annotated with '5. Reset check')

Below the 'Libraries Folder' field, there is a note: 'Different users and projects can share the same compilation libraries (see Help for details).' At the bottom, there are four buttons: '< Back', 'Next >', 'Finish' (Annotated with '6. Click'), and 'Cancel'. A 'Help' button is also present on the far right.



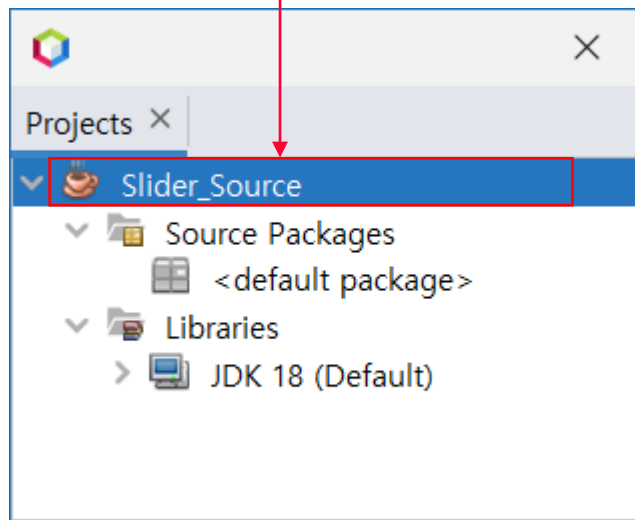




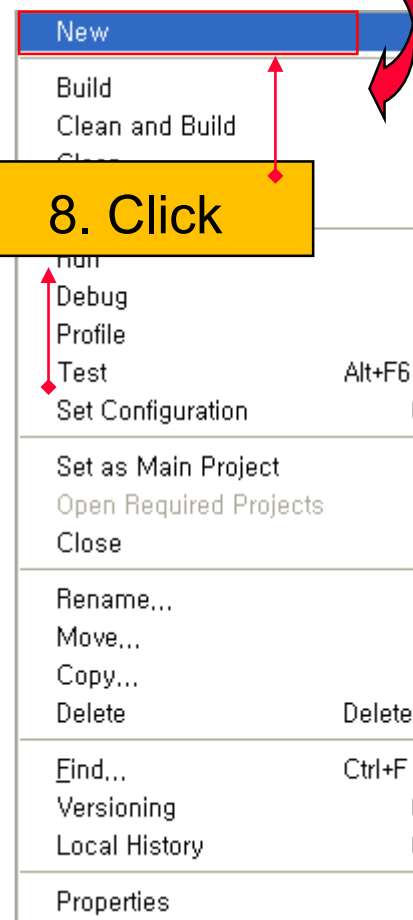
# Practice 3 : Slider Control (3)

## Create JFrame Form

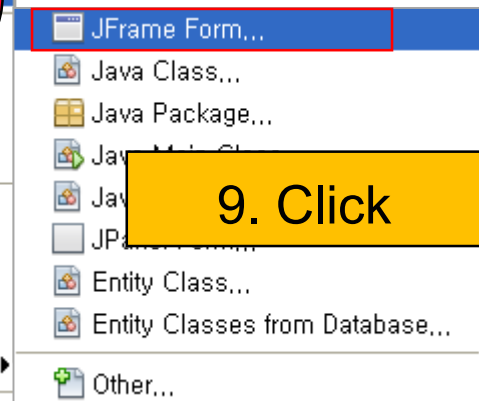
7. Mouse right-button Click



8. Click



9. Click





# Practice 3 : Slider Control (4)

## ■ Setting JFrame Form Name

### ❖ Create MainFrame.java

**New JFrame Form**

**Steps**

1. Choose File Type
2. **Name and Location**

**Name and Location**

Class Name: MainFrame

Project: Slider\_Source

Location: Source Packages

Package:

Created File: C:\Java\_Project\Slider\_Source\src\MainFrame.java

Superclass: Browse...

Interfaces: Browse...

10. Input "MainFrame"

11. Click

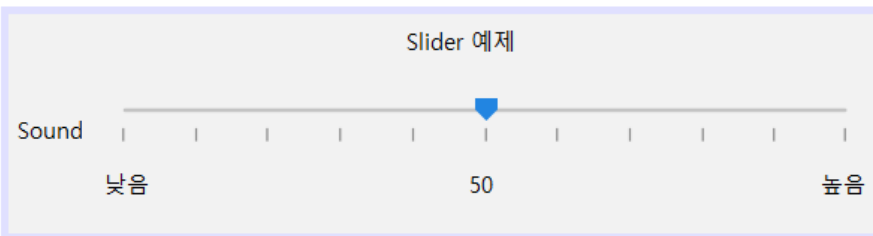
Warning: It is highly recommended that you do not place Java classes in the default package

< Back Next > Finish Cancel Help



# Practice 3 : Slider Control (5)

## Control Layout & Property Setting



Control	Properties Setting
jLabel1	<ul style="list-style-type: none"><li>• Variable Name : lblTitle</li><li>• Text : Slider 예제</li></ul>
jLabel2	<ul style="list-style-type: none"><li>• Variable Name : lblSound</li><li>• Text : Sound</li></ul>
jLabel3	<ul style="list-style-type: none"><li>• Variable Name : lblLow</li><li>• Text : 낮음</li></ul>
jLabel4	<ul style="list-style-type: none"><li>• Variable Name : lblHigh</li><li>• Text : 높음</li></ul>
jLabel5	<ul style="list-style-type: none"><li>• Variable Name : lblValue</li><li>• Text : 50</li></ul>

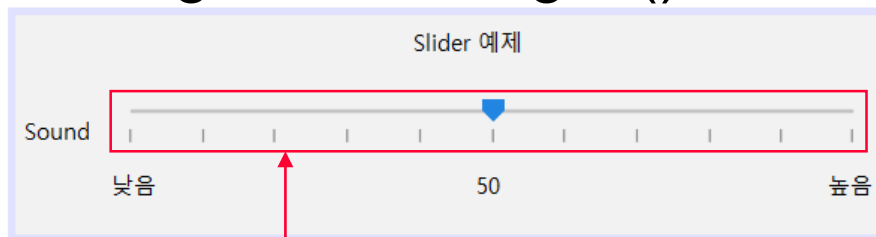
Control	Properties Setting
jSlider1	<ul style="list-style-type: none"><li>• majorTickSpacing : 10</li><li>• paintTicks : <input checked="" type="checkbox"/></li><li>• paintTrack : <input checked="" type="checkbox"/></li></ul>



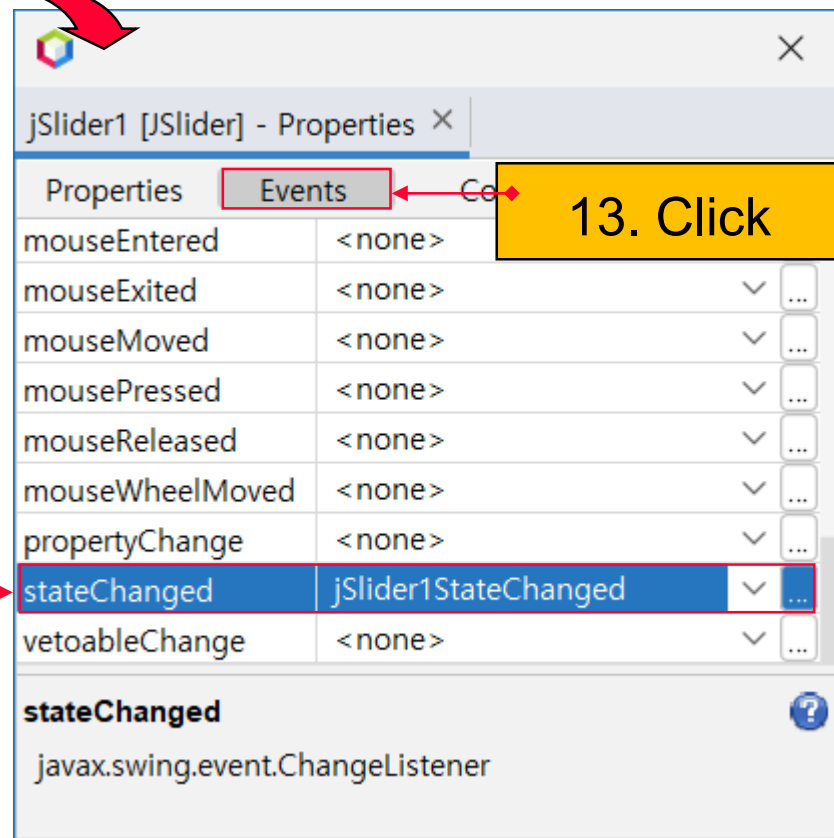


# Practice 3 : Slider Control (6)

## ■ Setting StateChanged() Event Handler



12. Click



13. Click

14. Setting





# Practice 3 : Slider Control (7)

## ❖ jSlider1StateChanged() Event Handler

```
MainFrame.java - Editor
MainFrame.java x
Source Design History
90 private void jSlider1StateChanged(javax.swing.event.ChangeEvent evt) {
91     String strData = null;
92     int iValue = 0;
93
94     iValue = jSlider1.getValue(); //Return jSlider1 Value
95     strData = Integer.toString(iValue); //Integer -> String
96     lblValue.setText(strData);
97 }
98
99
100 /**
101  * @param args the command line arguments
102  */
103 public static void main(String args[]) {
104     java.awt.EventQueue.invokeLater(new Runnable() {
105         public void run() {
106             new MainFrame().setVisible(true);
107         }
108     });
109 }
```

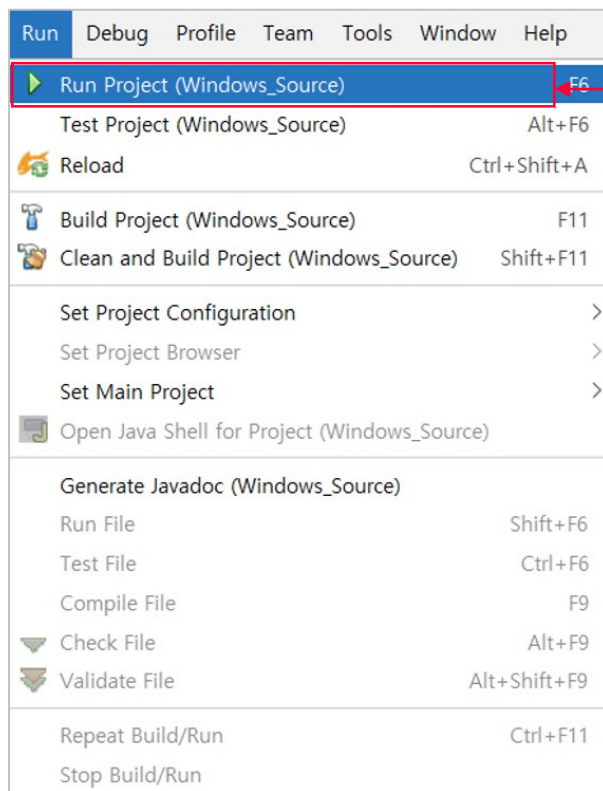
15. Coding



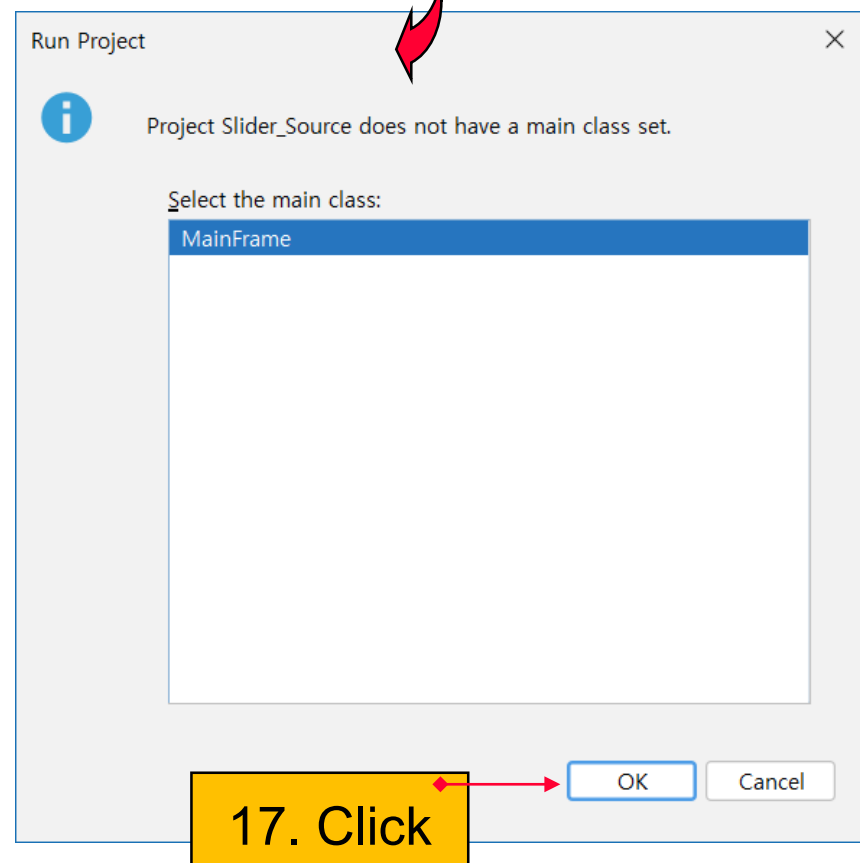


# Practice 3 : Slider Control (8)

## Run



16. Click



17. Click





# Practice 3 : Slider Control (9)

■ Run

❖ Slider 조정



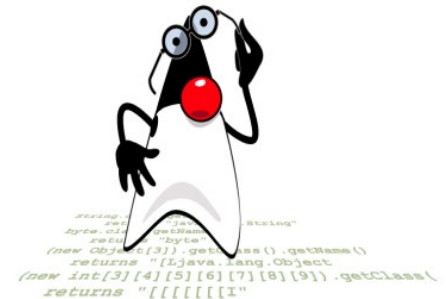
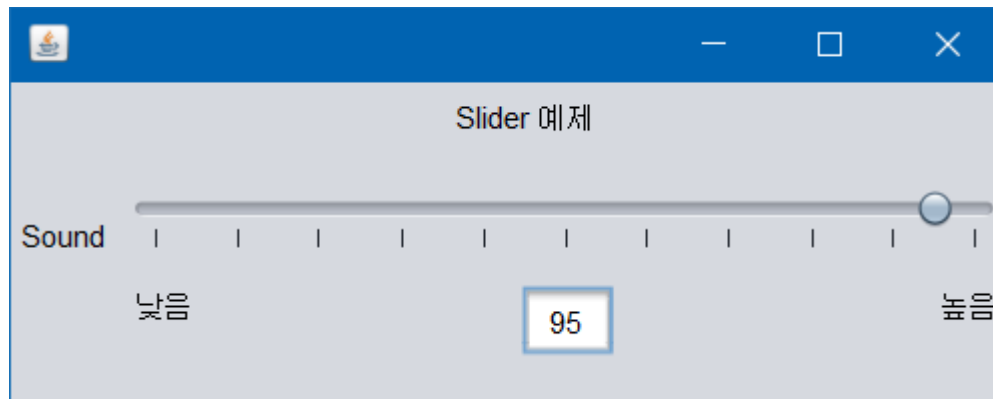


# Practice 4 : Slider Control

## ❖ Project Name: Slider2\_Source(Time: 20 min)

### ■ Input Slider Value

- Slider를 조정한 위치의 값을 txtField Control에 출력하도록 구현하시오.
- Slider의 입력값에 따라 Slider를 조정하도록 구현하시오.







# Practice 4 : Slider Control (1)

## ❖ jSlider1StateChanged() Event Handler

```
SliderFrame.java - Editor
SliderFrame.java x
Source Design History
1
2 import java.awt.event.KeyEvent;
3
4 public class SliderFrame extends javax.swing.JFrame {
5
6     /** Creates new form SliderFrame ...3 lines */
9     public SliderFrame() {...3 lines}
12
13     /** This method is called from within the constructor to initialize the form ...4 lines */
17     @SuppressWarnings("unchecked")
18     Generated Code
99
100 private void jSlider1StateChanged(javax.swing.event.ChangeEvent evt) {
101     String strData = null;
102     int iValue = 0;
103
104     iValue = jSlider1.getValue(); //Return jSlider1 Value
105     strData = Integer.toString( iValue); //Integer -> String
106     ①
107 }
```





# Practice 4 : Slider Control (2)

## ❖ KeyTyped() Event Handler

15. Coding

```
SliderFrame.java - Editor
SliderFrame.java x
Source Design History
1
2 import java.awt.event.KeyEvent;
3
4 public class SliderFrame extends javax.swing.JFrame {
5
6     /** Creates new form SliderFrame ...3 lines */
9     public SliderFrame() {...3 lines}
12
13     /** This method is called from within the constructor to initialize the form ...4 lines */
17     @SuppressWarnings("unchecked")
18     Generated Code
99
108     private void jSlider1StateChanged(javax.swing.event.ChangeEvent evt) {...8 lines}
109
110     private void txtFD_ValueKeyTyped(java.awt.event.KeyEvent evt) {
111         String strData = null;
112         int iValue = 0;
113
114         if( ② ){
115             strData = txtFD_Value.getText();
116             ③ //String -> Integer
117             //Setting jSlider1 Value
118         }
119     }
```





# 학습 요약

- TabbedPane Control
- Progress Bar Control
- Slider Control

