

# GUI Controls

## GUI : graphical user interface

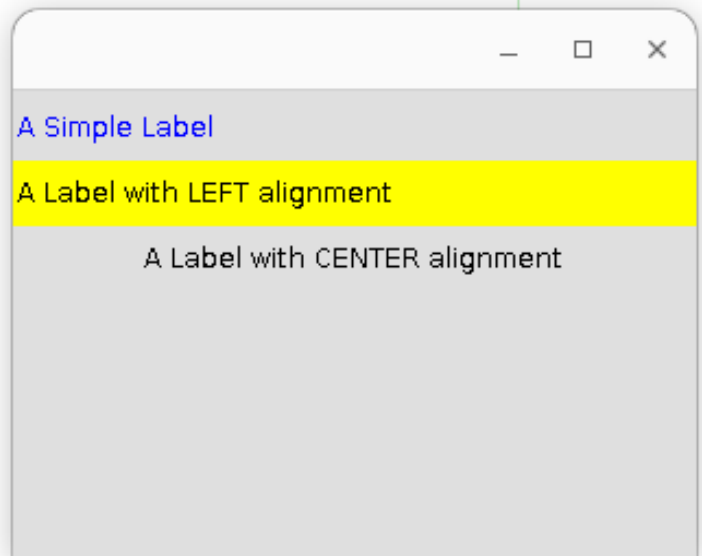
- Java allows the use of graphical components to let us interact with electronic devices such as computers, mobiles and tablets.
- Since text command-line interfaces were complex and somewhat uneasy to understand, the role of GUI is crucial.
- Examples of GUI controls: Label, Choice, TextField, Label, Button, TextArea, Scrollbar, Checkbox, List, Checkbox Group, etc.
- GUI controls can be opened by clicking/pointing to a small image, such as icon or widget.
- GUI enables user-centered design for software application programming.
- Packages such as awt and swing enable use to do GUI programming.

## Example #1: Label

```

1  import java.awt.*;
2  public class LabelDemo extends Frame {
3      // Declaration
4      private LayoutManager Layout;
5      private Label Label1;
6      private Label Label2;
7      private Label Label3;
8
9      public LabelDemo () {
10
11         // Instantiation
12         Layout = new GridLayout (7, 1);
13         Label1 = new Label ("A Simple Label");
14         Label2 = new Label ("A Label with LEFT alignment", Label.LEFT);
15         Label3 = new Label ("A Label with CENTER alignment", Label.CENTER);
16
17         // Location
18         setLayout (Layout);
19         add (Label1);
20         add (Label2);
21         add (Label3);
22
23         // Decoration
24         Label2.setBackground (Color.yellow);
25         Label1.setForeground (Color.blue);
26     }
27
28     public static void main(String[] args){
29         LabelDemo ld = new LabelDemo();
30         ld.setVisible(true);
31         ld.setSize(400,300);
32     }
33 }
34

```



## Example #2: Choice

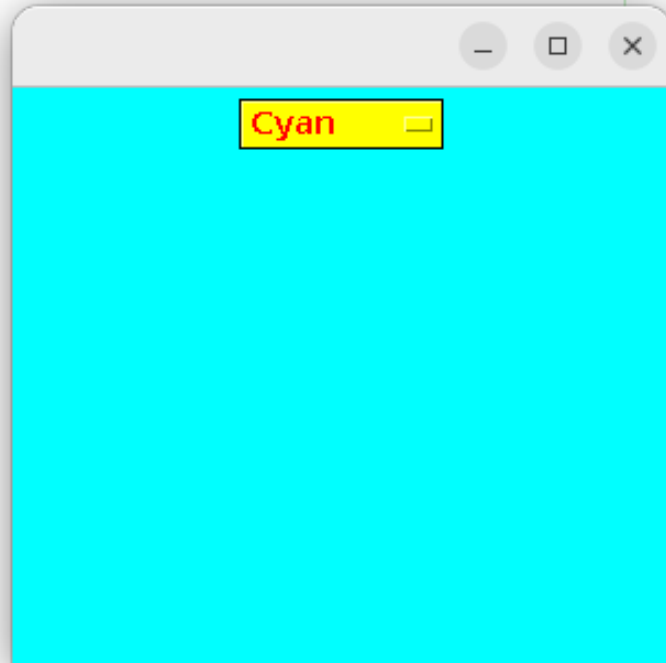
Program to display a list of colors in choice. Upon selecting an item ( i.e. color name) in the choice, the background of the Frame is colored in the respective color.

```

1  import java.awt.*;
2  import java.awt.event.*;
3
4  public class ChoiceDemo extends Frame implements ItemListener {
5      private LayoutManager Layout;
6      private Choice Selector;
7      private Font SansSerif;
8
9      public ChoiceDemo () {
10         String [] ColorList;
11         int i;
12
13         ColorList = new String [9];
14         SansSerif = new Font ("SansSerif", Font.BOLD, 14);
15         Layout = new FlowLayout ();
16         Selector = new Choice ();
17
18         ColorList [0] = "Red";    ColorList [1] = "Magenta";
19         ColorList [2] = "Blue";   ColorList [3] = "Cyan";
20         ColorList [4] = "Green";  ColorList [5] = "Yellow";
21         ColorList [6] = "White";  ColorList [7] = "Gray";
22         ColorList [8] = "Black";
23         for (i = 0; i < ColorList.length; ++i) {
24             Selector.insert (ColorList [i], i);
25         }
26         Selector.setBackground (Color.yellow);
27         Selector.setForeground (Color.red);
28         Selector.setFont (SansSerif);
29
30         setLayout (Layout);
31         add (Selector);
32
33         Selector.addItemListener (this);
34
35         Selector.select (5);
36         setBackground (Color.yellow);
37     }

```

```
public void itemStateChanged(ItemEvent e) {  
    int Selection;  
    Selection = Selector.getSelectedIndex();  
    if (Selection == 0) {  
        setBackground (Color.red);  
    } else if (Selection == 1) {  
        setBackground (Color.magenta);  
    } else if (Selection == 2) {  
        setBackground (Color.blue);  
    } else if (Selection == 3) {  
        setBackground (Color.cyan);  
    } else if (Selection == 4) {  
        setBackground (Color.green);  
    } else if (Selection == 5) {  
        setBackground (Color.yellow);  
    } else if (Selection == 6) {  
        setBackground (Color.white);  
    } else if (Selection == 7) {  
        setBackground (Color.gray);  
    } else if (Selection == 8) {  
        setBackground (Color.black);  
    }  
}  
  
public static void main(String[] args){  
    ChoiceDemo cd= new ChoiceDemo();  
    cd.setVisible(true);  
    cd.setSize(300,300);  
}
```



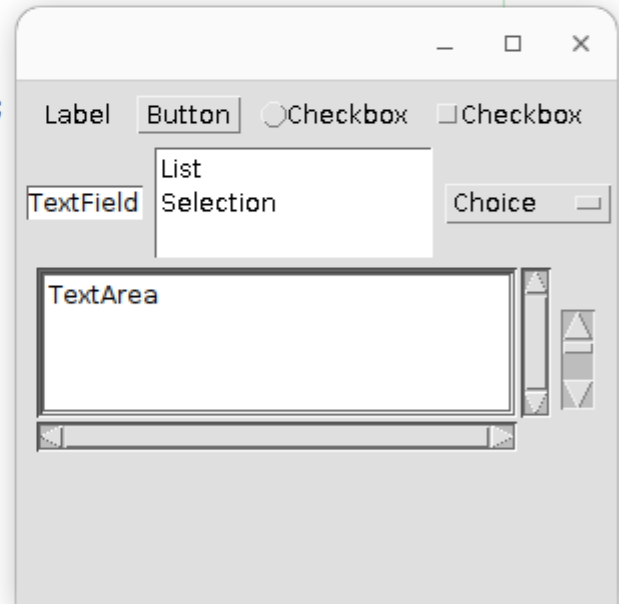
### Example #3: Java GUI Controls

Program using many GUI elements like Label, Button, Scrollbar, Checkbox, TextField, TextArea.

```

1  import java.awt.*;
2
3  public class ControlsDemo extends Frame {
4      private Label DemoLabel;
5      private Button DemoButton;
6      private Scrollbar DemoSlider;
7      private Checkbox DemoRadio;
8      private Checkbox DemoBox;
9      private TextField DemoText;
10     private TextArea DemoArea;
11     private Choice DemoCombo;
12     private List DemoList;
13     private LayoutManager Layout;
14     private CheckboxGroup Group;
15
16     public ControlsDemo () {
17         DemoLabel = new Label ();    DemoSlider = new Scrollbar ();
18         Group = new CheckboxGroup ();
19         DemoRadio = new Checkbox ("Checkbox", Group, false);
20         DemoBox = new Checkbox ();    DemoButton = new Button ();
21         DemoText = new TextField ();    DemoCombo = new Choice ();
22         DemoList = new List (3);    DemoArea = new TextArea (5, 30);
23         Layout = new FlowLayout ();
24
25         setLayout (Layout);
26         add (DemoLabel);    add (DemoButton);
27         add (DemoRadio);    add (DemoBox);
28         add (DemoText);    add (DemoList);
29         add (DemoCombo);    add (DemoArea);
30         add (DemoSlider);
31
32         DemoLabel.setText ("Label");
33         DemoSlider.setName ("Scrollbar");
34         DemoButton.setLabel ("Button");
35         DemoBox.setLabel ("Checkbox");
36         DemoText.setText ("TextField");
37         DemoCombo.addItem ("Choice");
38         DemoCombo.addItem ("Selection");
39         DemoList.add ("List");
40         DemoList.add ("Selection");
41         DemoArea.setText ("TextArea");
42     }
43
44     public static void main(String[] args){
45         ControlsDemo t= new ControlsDemo();
46         t.setVisible(true);
47         t.setSize(300,300);
48     }
49 }
50

```



## Example #4: TextField

Add event handling code to enable echo behavior.

```

1
2  import java.awt.*;
3
4  public class TextFieldDemo extends Frame{
5      /* Declaration */
6      TextField Input;
7      TextField Echo;
8      LayoutManager Layout;
9
10     public TextFieldDemo () {
11         /* Instantiation */
12         Input = new TextField ("Input", 35);
13         Echo = new TextField ("Text entered above will appear here.", 35);
14         Layout = new FlowLayout ();
15
16         /* Decoration */
17         setBackground (Color.yellow);
18         Input.setBackground (Color.green);
19         Echo.setForeground (Color.blue);
20
21         /* Location */
22         setLayout (Layout);
23         add (Input);
24         add (Echo);
25
26         /* Configuration */
27         Echo.setEditable (false);
28     }
29     public static void main(String []args){
30         TextFieldDemo tfd= new TextFieldDemo();
31         tfd.setVisible(true);
32         tfd.setSize(300,300);
33     }
34 }
35
36

```



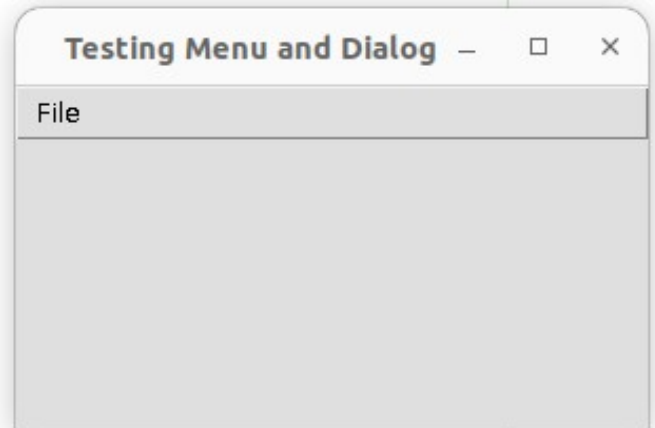
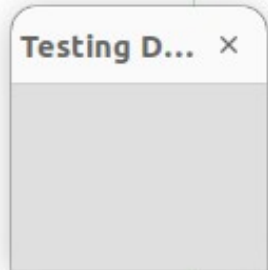


**Example #5: Menu and Dialog**

```

1  import java.awt.*;
2  import java.awt.event.*;
3
4  public class MenuDialogDemo extends Frame implements ActionListener{
5      Dialog d;
6      Menu filemenu;
7      MenuItem openitem;
8      MenuItem exititem;
9      MenuBar mb;
10     Label l;
11
12     public MenuDialogDemo(){
13         super("Testing Menu and Dialog");
14         setSize(300,200);
15         filemenu=new Menu("File");
16         openitem = new MenuItem("Display Dialog");
17         exititem = new MenuItem("Exit");
18         mb= new MenuBar();
19         l=new Label();
20
21         filemenu.add(openitem);
22         filemenu.add(exititem);
23         mb.add(filemenu);
24         setMenuBar(mb);
25
26         openitem.addActionListener(this);
27         exititem.addActionListener(this);
28     }
29
30     public void actionPerformed(ActionEvent e){
31         String cmd=e.getActionCommand();
32         if(cmd.equals("Exit")){
33             System.exit(0);
34         }
35         else if(cmd.equals("Display Dialog")){
36             d= new Dialog(this,"Testing Dialog",false);
37             d.setVisible(true);
38         }
39     }
40
41     public static void main(String[] args){
42         MenuDialogDemo t= new MenuDialogDemo();
43         t.setVisible(true);
44     }
45 }

```



**Example #6: TextArea**

```

1  import java.awt.*;
2  import java.awt.event.*;
3
4  public class TextAreaDemo extends Frame implements TextListener {
5      /* Declaration */
6      private TextArea ta1;
7      private TextArea ta2;
8      private LayoutManager Layout;
9
10     public TextAreaDemo () {
11         /* Instantiation */
12         ta1 = new TextArea (2, 40);
13         ta2 = new TextArea (2, 40);
14         Layout = new FlowLayout ();
15
16         /* Configuration */
17         ta1.addTextListener (this);
18         ta2.setEditable (false);
19
20         /* Location */
21         setLayout (Layout);
22         add (ta1);
23         add (ta2);
24
25         /* Decoration */
26         setBackground (Color.yellow);
27         ta1.setBackground (Color.green);
28         ta1.setText ("Enter text in this area and watch!");
29     }
30
31     public void textValueChanged (TextEvent e) {
32         String Entry;
33         Entry = ta1.getText ();
34         ta2.setText (Entry);
35     }
36
37     public static void main(String[] args){
38         TextAreaDemo t= new TextAreaDemo();
39         t.setVisible(true);
40         t.setSize(500,200);
41     }
42 }
43
44

```

