# 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: menus, tabs, buttons, scroll bars, checkbox, menus, icons, 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.

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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
```

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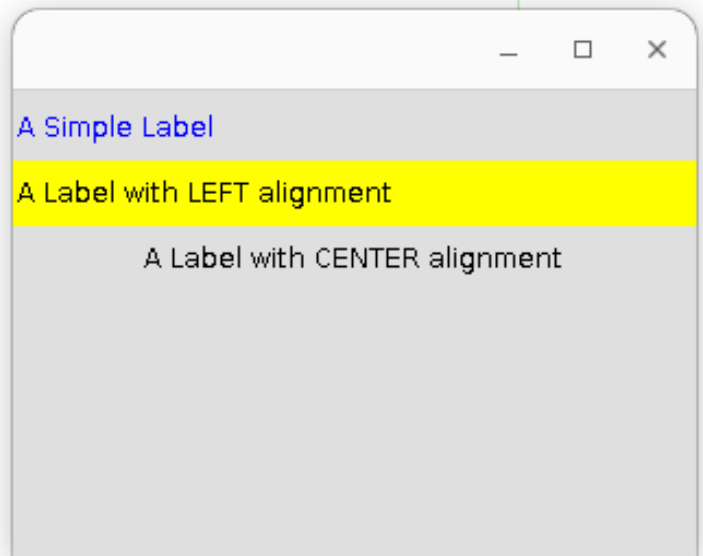
Example #2: Choice

```java
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      }
```

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```java
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);
    }
}
```

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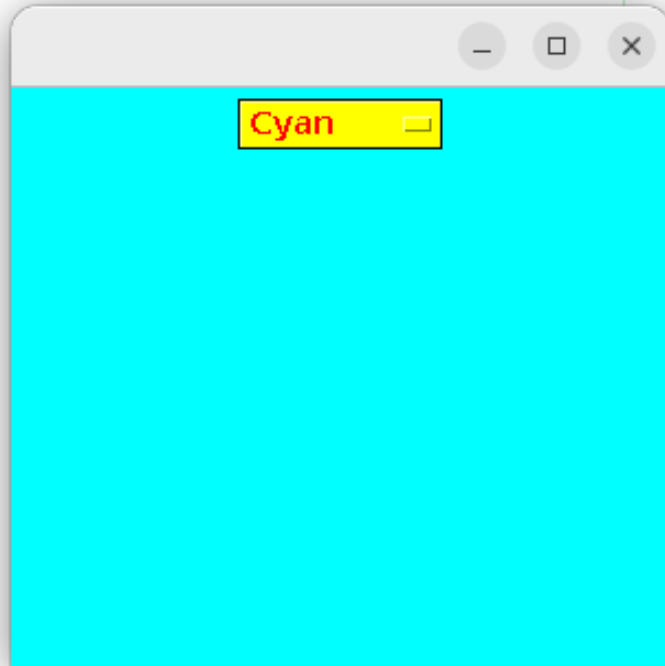
Example #3: Java GUI Controls

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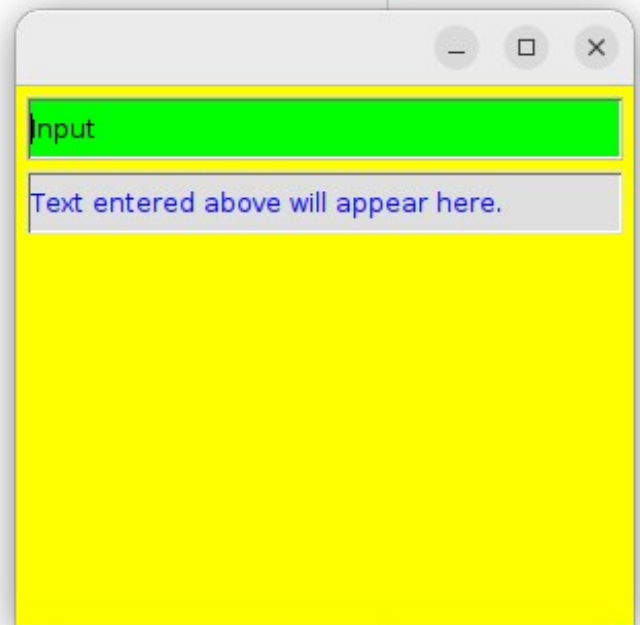
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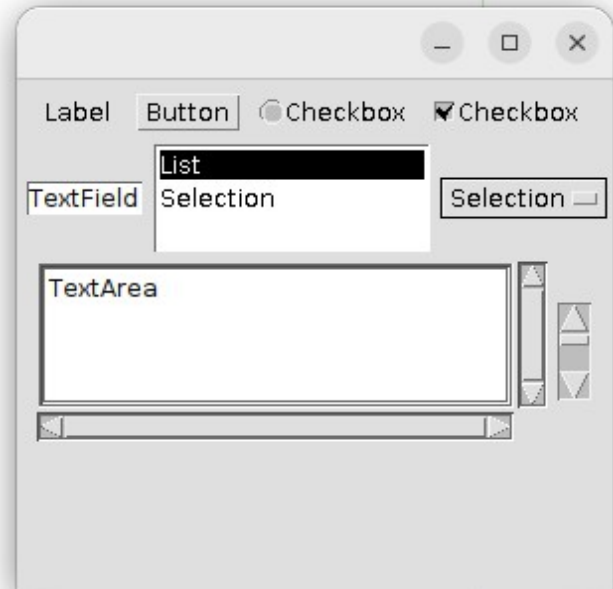
Example #4: TextField

Add event handling code to enable echo behavior.

```
1    import java.applet.*;
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
```
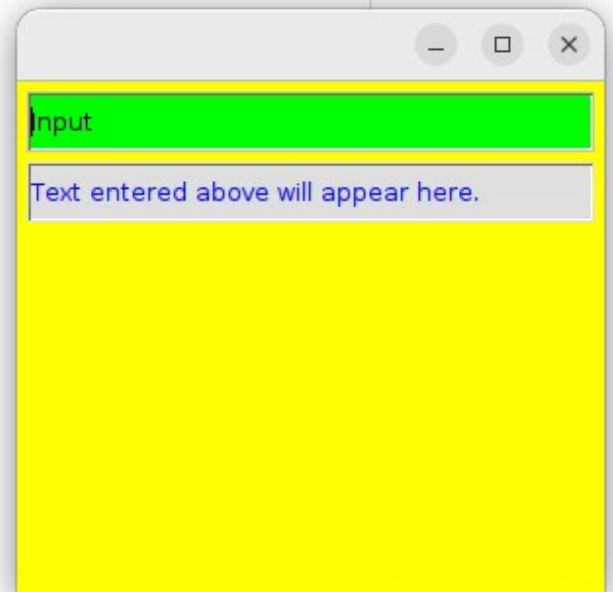
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Example #5: Button

```
1    import java.applet.*;
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
```

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Example #6: Menu and Dialog

```java
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  }
```

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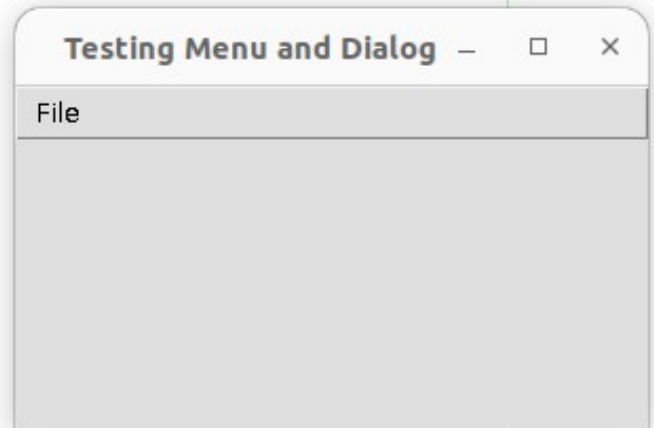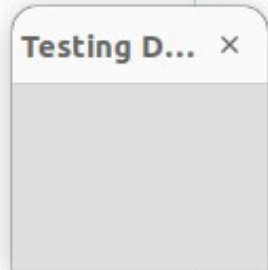
Example #7: TextArea

```
2    import java.awt.*;
3    import java.awt.event.*;
4
5    public class TextAreaDemo extends Frame implements  TextListener {
6      /* Declaration */
7      private TextArea Echo;
8      private TextArea Echo2;
9      private LayoutManager Layout;
10
11     public TextAreaDemo () {
12       /* Instantiation */
13       Echo = new TextArea (2, 40);
14       Echo2 = new TextArea (2, 40);
15       Layout = new FlowLayout ();
16
17       /* Configuration */
18       Echo.addTextListener (this);
19       Echo2.setEditable (false);
20
21       /* Location */
22       setLayout (Layout);
23       add (Echo);
24       add (Echo2);
25
26       /* Decoration */
27       setBackground (Color.yellow);
28       Echo.setBackground (Color.green);
29       Echo.setText ("Enter text in this area and watch!");
30     }
31
32     public void textValueChanged (TextEvent e) {
33       String Entry;
34       Entry = Echo.getText ();
35       Echo2.setText (Entry);
36     }
37
38     public static void main(String[] args){
39         TextAreaDemo t= new TextAreaDemo();
40         t.setVisible(true);
41         t.setSize(300,200);
42     }
43
44   }
```

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