Java Swing

Swing - bu oyna asosidagi dasturlarni yaratish uchun ishlatiladigan Java Foundation Classes (JFC) sinflarining bir qismi hisoblanadi. U AWT (Abstract Windowing Toolkit) API sinfining yuqori qismida qurilgan va to'liq java tilida yozilgan.

AWT platformasidan farqli turda, Swing platformadan mustaqil va engil komponentlarni taqdim etadi. javax.swing to'plami java swing API uchun JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser va boshqalar kabi sinflarni taqdim etadi.

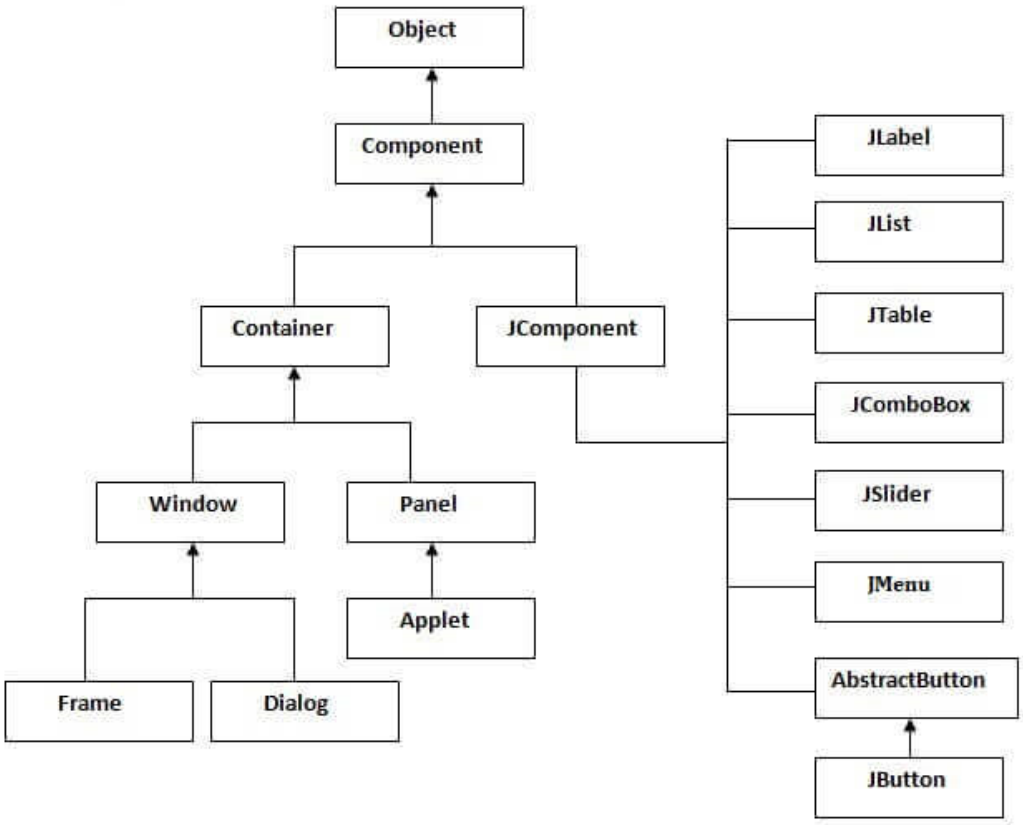
AWT va Swing platformalari o'rtasidagi farq

AWT va Swing platformalari o'rtasida quyida keltirilgan juda ko'p farqlar mavjud.

№	Java AWT	Java Swing
1	AWT komponentlari platformaga bog'liq	Java Swing komponentlari platformadan mustaqil
2	AWT komponentlari og'ir vaznga ega	Swing komponentlari engil
3	AWT Swing-ga qaraganda kamroq komponentlarni taqdim etadi	Swing jadvallar, ro'yxatlar, scrollpanes, colorchooser, tabbedpane va boshqalar kabi kuchli qismlarni taqdim etadi.
4	AWT MVC-ga amal qilmaydi (Model View Controller), bu yerda model ma'lumotlarni aks ettiradi, ko'rinish taqdimotni namoyish etadi va kontroller model va ko'rinish o'rtasidagi interfeys vazifasini bajaradi	Swing MVC-ni qo’llab quvvatlaydi

Java Swing sinflari iyerarxiyasi

Java swing API ierarxiyasi quyida keltirilgan.



Component sinfining ko’p ishlatiladigan usullari

Swing platformasida **Component** sinfining keng qo'llaniladigan usullari quyida keltirilgan.

№	Usul	Usul tasnifi
1	public void add(Component c)	komponentni boshqa komponentga qo'shish
2	public void setSize(int width,int height)	komponentning o’lchamini belgilaydi
3	public void setLayout(LayoutManager m)	komponent uchun tartib menejerini o'rnatadi
4	public void setVisible(boolean b)	komponentning ko'rinishini belgilaydi. Agar qiymat berilmagan bo’lsa, false qiymatiga teng bo’ladi

Misollar

Freymni yaratishning ikki yo'li mavjud:

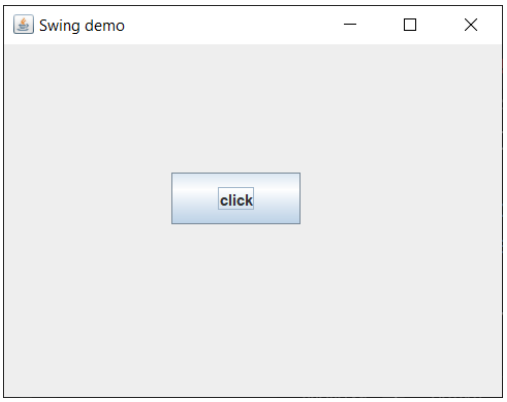
- Frame sinfi (assotsiatsiya) ob'ektini yaratish orqali
- Frame sinfini (meros) kengaytirish orqali

Swing kodini **main()**, konstruktor yoki boshqa usulning ichiga yozish mumkin.

Biz bitta tugmachani yaratib, main () usuli ichida JFrame ob'ektiga qo'shadigan oddiy belanchak misolini ko'rib chiqamiz.

```
import javax.swing.*;

public class SwingDemo {
    public static void main(String[] args) {
        JFrame f = new JFrame(); // JFrame-dan obyekt yaratish
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE); // freymning
                          //chiqish tugmasi bosilganda dasturdan chiqish
        JButton b = new JButton("click"); // JButton-dan obyekt yaratish
        b.setBounds(130, 100, 100, 40);// x koordinatasi, y koor-si, kenglik,
                                       //balandlik
        f.add(b);// JFrame-ga tugmachani qo'shish

        f.setSize(400, 500); // 400 kenglik va 500 balandlik
        f.setLayout(null);   // joylashuv manejeri
        f.setVisible(true);  // freymni ko'rinadigan qilish
    }
}
```

Natija:

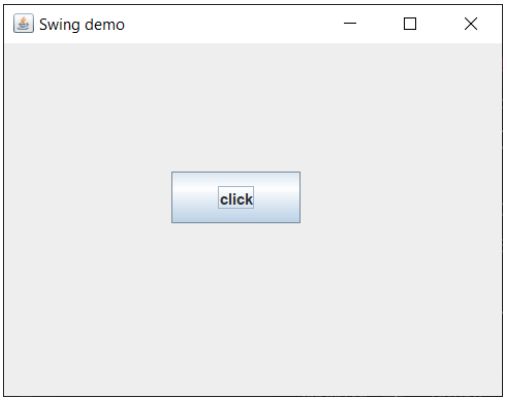


JFrame, JButton va usul chaqiruvini yaratishning barcha kodlarini konstruktor ichiga yozishimiz mumkin.

```
import javax.swing.*;

public class SwingDemo2 {
    private JFrame f;

    SwingDemo2() {
        f = new JFrame();
        f.setTitle("Swing demo");
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        JButton b = new JButton("click");
        b.setBounds(130, 100, 100, 40);

        f.add(b);

        f.setSize(400, 500);
        f.setLayout(null);
        f.setVisible(true);
    }

    public static void main(String[] args) {
        new SwingDemo2();
    }
```

```
}
```

Natija:



Shuningdek, JFrame sinfini meros qilib olishimiz mumkin, shuning uchun JFrame sinfining nusxasini aniq yaratishga hojat yo'q.

```
import javax.swing.*;

public class SwingDemo3 extends JFrame {
    JFrame f;

    SwingDemo3() {
        JButton b = new JButton("click");
        b.setBounds(130, 100, 100, 40);

        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        add(b);
        setSize(400, 500);
        setLayout(null);
        setVisible(true);
    }

    public static void main(String[] args) {
        new SwingDemo3();
    }
}
```

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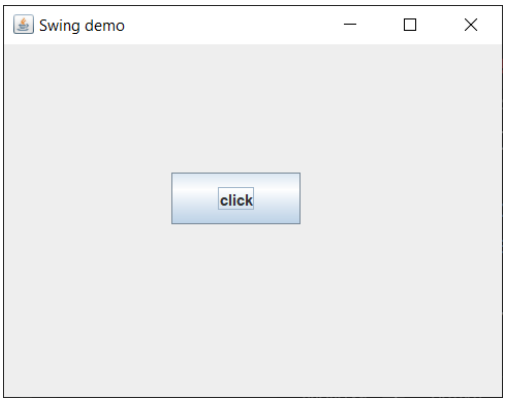


Swing komponentalari

JButton klassi platformani mustaqil ravishda amalga oshiradigan yorliqli tugmani yaratish uchun ishlatiladi. Ilova tugmachani bosganda biron bir harakatga olib keladi. U AbstractButton sinfidan meroslik olgan.

javax.swing.JButton sinfini ko'rib chiqamiz.

```
public class JButton extends AbstractButton implements Accessible
```

Odatda ishlatiladigan konstruktorlar:

Konstruktor	**Tasnif**
JButton()	Matn va piktogramma bo'lmagan tugmachani yaratish
JButton(String s)	Berilgan matn bilan tugma hosil qilish
JButton(Icon i)	piktogramma ob'ekti bilan tugma hosil qilish

AbstractButton sinfining ko’p ishlatiladigan usullari:

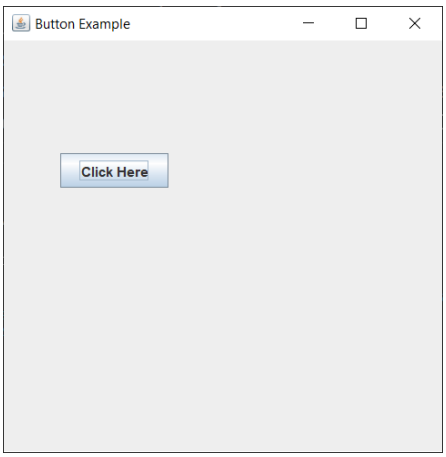
Usul	**Tasnif**
void setText(String s)	tugmani berilgan matnni o'rnatish uchun ishlatiladi
String getText()	tugma matnini qaytarish uchun ishlatiladi.
void setEnabled(boolean b)	tugmani yoqish yoki o'chirib qo’yish uchun ishlatiladi.
void setIcon(Icon b)	tugmaga piktogramma o'rnatish uchun ishlatiladi
Icon getIcon()	tugma piktogrammasini olish uchun ishlatiladi.
void setMnemonic(int a)	Mnemonikani tugmachaga o'rnatish uchun ishlatiladi.
void addActionListener(ActionListener a)	Ushbu ob'ektga harakat tinglovchisini qo'shish uchun foydalaniladi.

JButton komponentasiga misol:

```
import javax.swing.*;

public class ButtonExample {
    public static void main(String[] args) {
        JFrame f = new JFrame("Button Example");
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        JButton b = new JButton("Click Here");
        b.setBounds(50, 100, 95, 30);
        f.add(b);
        f.setSize(400, 400);
        f.setLayout(null);
        f.setVisible(true);
    }
}
```

Natija:

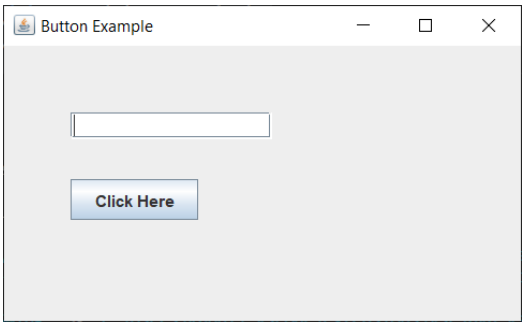


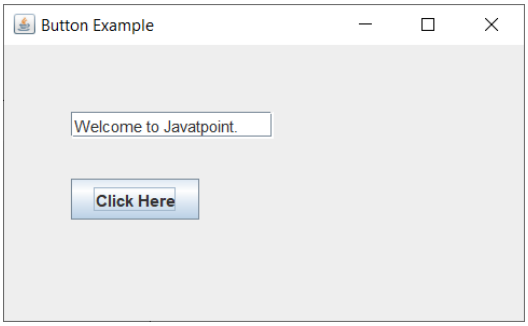
JButton komponenti ActionListener hodisasi bilan misolida

```
import java.awt.event.*;
import javax.swing.*;

public class ButtonExample2 {
    public static void main(String[] args) {
        JFrame f = new JFrame("Button Example");
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        final JTextField tf = new JTextField();
        tf.setBounds(50, 50, 150, 20);
        JButton b = new JButton("Click Here");
        b.setBounds(50, 100, 95, 30);
        b.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                tf.setText("Welcome to Javatpoint.");
            }
        });
        f.add(b);
        f.add(tf);
        f.setSize(400, 400);
        f.setLayout(null);
        f.setVisible(true);
    }
}
```

Natija:





Tugmachada rasmni ko'rsatish misoli:

```
import javax.swing.*;

public class ButtonExample3 {
    ButtonExample3() {
        JFrame f = new JFrame("Button Example");
        JButton b = new JButton(new ImageIcon("icon.png"));
        b.setBounds(40, 70, 200, 30);
```

```
        f.add(b);
        f.setSize(300, 400);
        f.setLayout(null);
        f.setVisible(true);
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public static void main(String[] args) {
        new ButtonExample3();
    }
}
```

Natija: