BITS Pilani
Pilani Campus

# Object Oriented Programming
# CS F213

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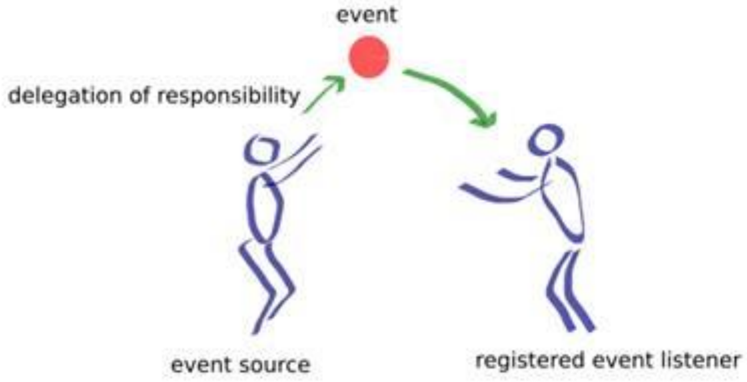
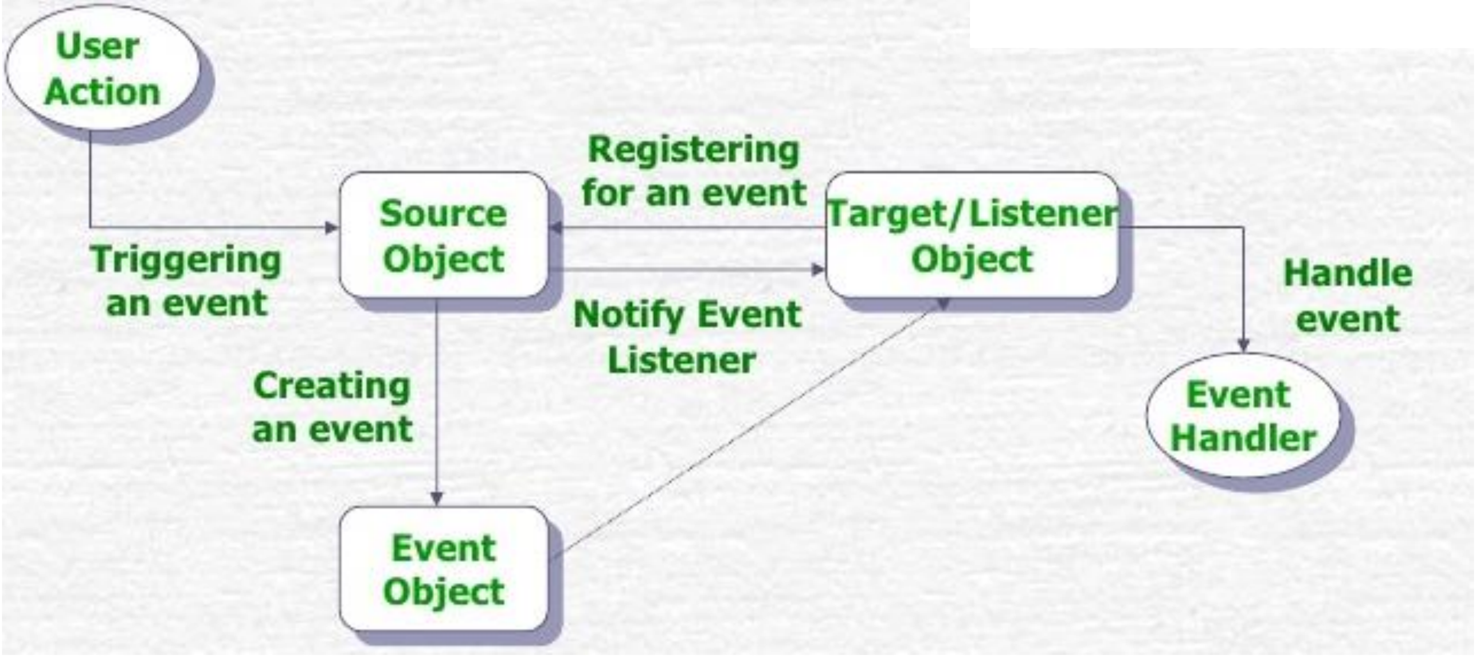
# Event Handling





# AWT Event Handling - Example

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

class test extends Frame implements ActionListener{
TextField tf;
test(){
    setTitle("Core Banking");
    tf = new TextField();
    tf.setBounds(100,50,170,30);
    Button b=new Button("Submit");
    b.setBounds(100,100,100,30);
    add(b);
    add(tf);

    b.addActionListener(this);
```

# AWT Event Handling - Example

```
    setSize(1000,1000);
    setBackground(Color.cyan);
    setLayout(null);
    setVisible(true);
 }
public static void main(String[] args)
{
     test t= new test();
}

public void actionPerformed(ActionEvent E)
{
tf.setText("Welcome to Core Banking");
}
}
```

# Event Handling by an External Class-Example

```
import java.awt.*;
import java.awt.event.*;
class test extends Frame{
TextField tf;
Label l;
test() {
    setTitle("Core Banking");
    tf = new TextField();
    tf.setBounds(100,100,170,30);

    Button b=new Button("Submit");
    b.setBounds(100,150,100,30);

    l = new Label();
    l.setBounds(100,50,170,30);
    l.setBackground(Color.green);
```

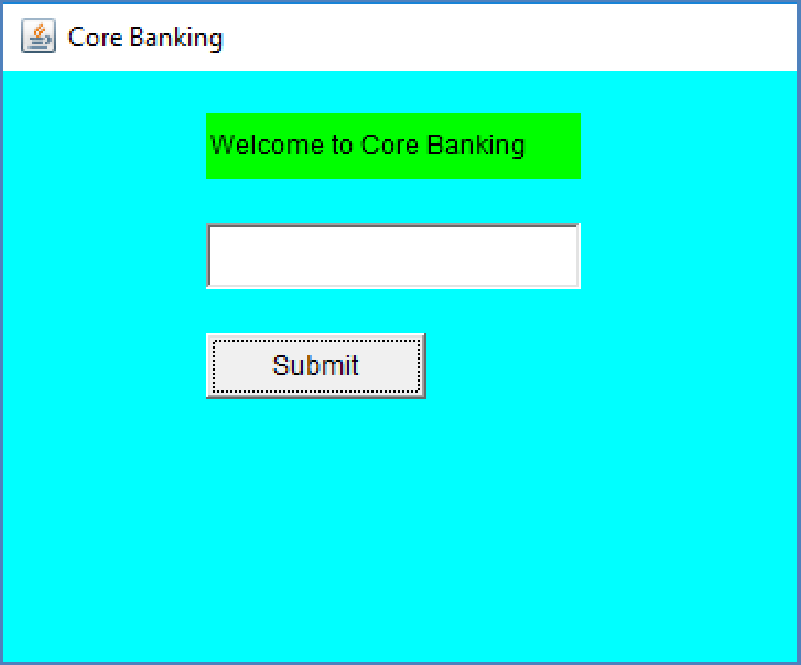
# Event Handling by an External Class-Example

```
    add(b);
    add(tf);
    add(l);

    AHandler a = new AHandler(this);
    b.addActionListener(a);
    tf.addTextListener(a);

    setSize(1000,1000);
    setBackground(Color.cyan);
    setLayout(null);
    setVisible(true);   }
public static void main(String[] args) {
     test t= new test(); }
}
```

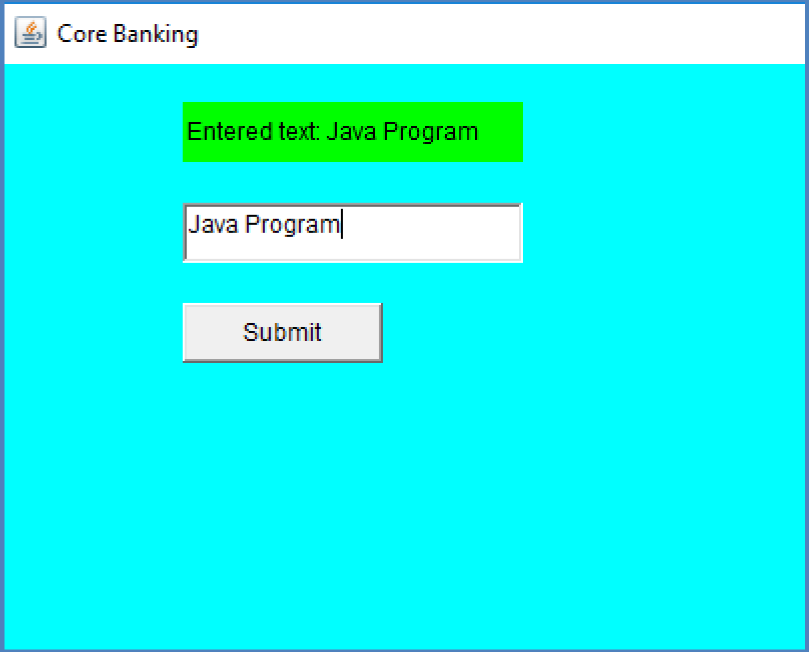
# Event Handling by an External Class-Example

```
class AHandler implements ActionListener,TextListener{
test obj;
AHandler(test t){
this.obj = t;
}
public void textValueChanged(TextEvent e) {
     obj.l.setText("Entered text: " + obj.tf.getText());
     }

public void actionPerformed(ActionEvent E) {
     obj.l.setText("Welcome to Core Banking");}
}
```

# Screen Shot



Welcome to Core Banking



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Java Program

# Event Handling by Anonymous Class- Example

```
b.addActionListener(new ActionListener() {
  public void actionPerformed(ActionEvent E) {
          l.setText("Welcome to Core Banking");}
  });


  tf.addTextListener(new TextListener() {
   public void textValueChanged(TextEvent E) {
          l.setText("Entered text: " + tf.getText());
      }
  });
```

# Key AWT GUI Concepts

- Java supports three GUI frameworks
  - AWT, Swing, JavaFX

- Four Key features of AWT programs
  - Frame: Top level window is created by extending the Frame class
  - paint(): Override the paint method to display output in the window. This method is called by the run time system.
  - repaint(): Invoke the repaint method if the program needs output to be displayed. Awt program cannot call the paint method directly.
  - System.exit(): When the top level window is closed, it does not cause the program to terminate. It is necessary to handle the window-close event through a System.exit() call.

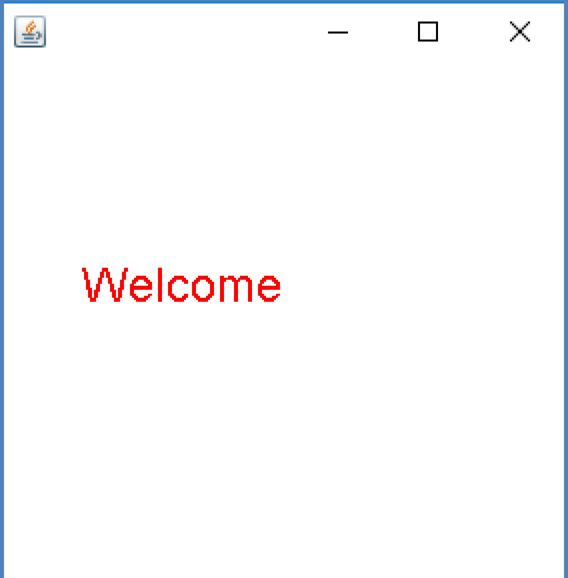
# Handling Mouse Events - Example

```
import java.awt.*;
import java.awt.event.*;
public class test extends Frame implements MouseListener{
    String msg ="Welcome";
    Color c = Color.red;

        test(){
               addMouseListener(this);
               setSize(300,300);
               setLayout(null);
               setVisible(true);     }

        public void mouseEntered(MouseEvent e) {
            msg = "Mouse Entered";
            repaint();        }
```

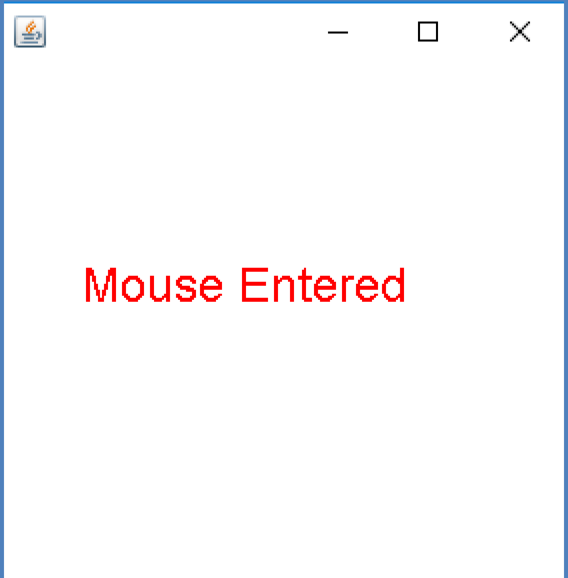
# Handling Mouse Events - Example

```
        public void mouseExited(MouseEvent e) {
             msg = "Mouse Exited";
             repaint();        }

         public void mouseClicked(MouseEvent e) {
                  Graphics g=getGraphics();
                  g.setColor(Color.BLUE);
                  g.fillOval(e.getX(),e.getY(),30,30);     }

         public void mousePressed(MouseEvent e) {        }
         public void mouseReleased(MouseEvent e) {       }

         public void paint(Graphics g) {
                  g.setColor(c);
                  Font font = new Font("TimesNewRoman", Font.PLAIN, 24);
                  g.setFont(font);
                  g.drawString(msg, 50, 150);      }

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

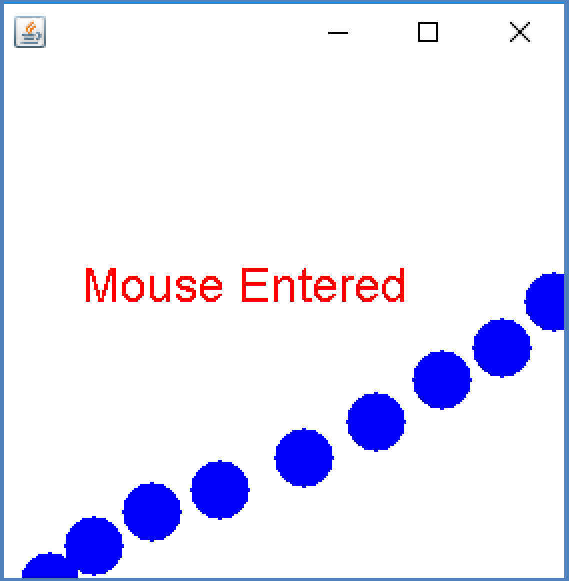
# Screen Shot



Welcome



Mouse Entered



Mouse Entered

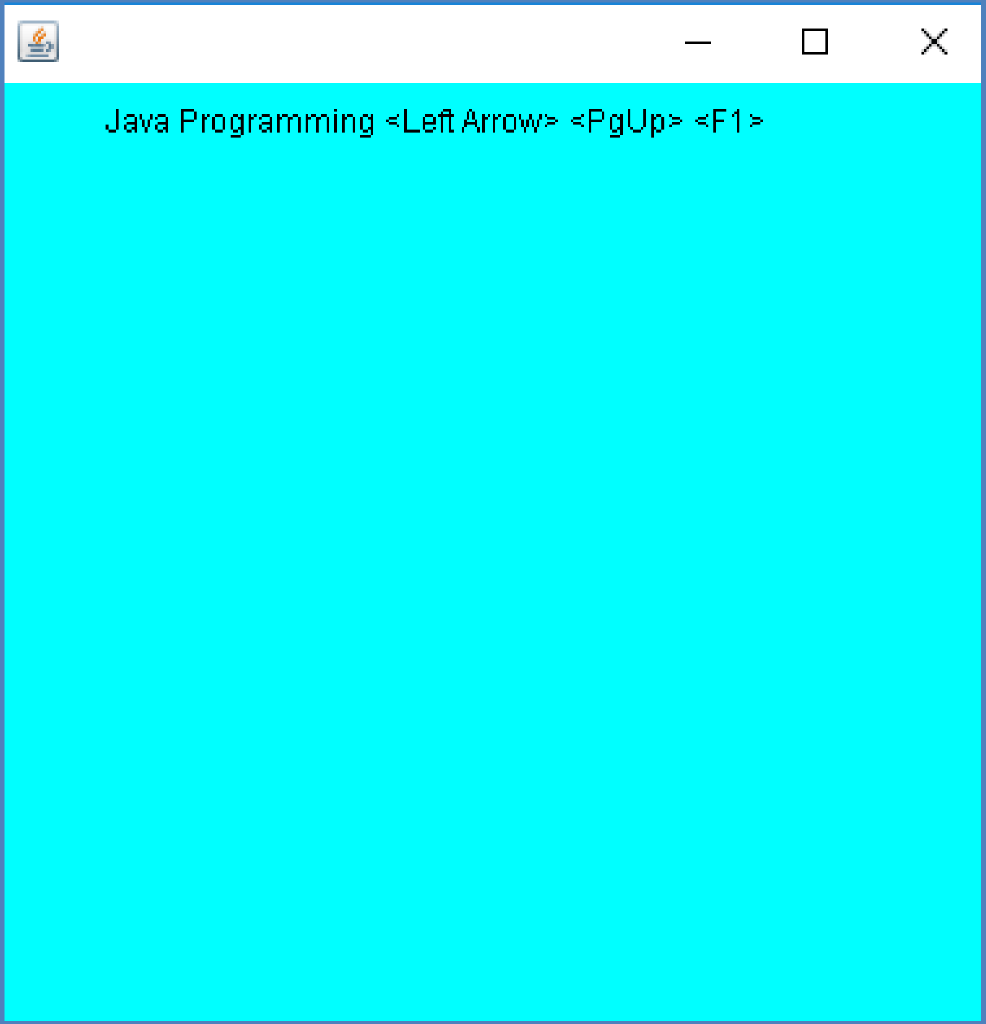
# Handling Key Events-Example

```
import java.awt.*;
import java.awt.event.*;
public class test extends Frame implements KeyListener{
    String msg = "";

    test(){
        addKeyListener(this);
        setSize(400,400);
        setLayout(null);
        setVisible(true);
        setBackground(Color.cyan);    }

    public void keyPressed(KeyEvent e) {
    int key = e.getKeyCode();
    switch(key) {
        case KeyEvent.VK_F1: msg += "<F1>";break;
        case KeyEvent.VK_PAGE_UP: msg += "<PgUp>";break;
        case KeyEvent.VK_LEFT: msg += "<Left Arrow>";break;}
    repaint();    }
```

# Handling Key Events - Example

```
public void keyReleased(KeyEvent e) {
       repaint();       }

    public void keyTyped(KeyEvent e) {
    msg +=e.getKeyChar();
    repaint();    }

    public void paint(Graphics g) {
    g.drawString(msg, 50, 50);   }

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

# Screen shot



```
Java Programming <Left Arrow> <PgUp> <F1>
```

# Review Questions

- What is a listener in context to event handling?

a. A listener is a variable that is notified when an event occurs
b. A listener is a object that is notified when an event occurs
c. A listener is a method that is notified when an event occurs
d. None of the mentioned

- Which of these events will be notified if scroll bar is manipulated?

a. ActionEvent
b. ComponentEvent
c. AdjustmentEvent
d. WindowEvent

# Review Questions

- Which of these constant value will change when the button at the end of scroll bar was clicked to increase its value?
  a. BLOCK_DECREMENT
  b. BLOCK_INCREMENT
  c. UNIT_DECREMENT
  d. UNIT_INCREMENT

- Create 3 labels, 3 text fields (Number 1, Number 2 and Result) and a Button (Enter) using AWT. Get the two numbers as input from the user and display the result when the 'Enter' Button is pressed. Handle the Key and mouse events.