

**Laporan Praktikum**  
**Praktikum Bahasa Pemrograman**

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## Pretest

1. AWT (Abstract Window Toolkit) adalah salah satu pustaka antarmuka pengguna grafis (GUI) di Java yang menyediakan komponen dan kelas untuk membuat aplikasi desktop dengan antarmuka grafis. AWT adalah bagian dari Java Foundation Classes (JFC) dan digunakan untuk membuat aplikasi berbasis GUI seperti jendela, tombol, kotak teks, dan komponen grafis lainnya.
2. Menyediakan Komponen GUI, Pengelolaan Tata Letak (Layout Management), Event Handling (Penanganan Peristiwa), Menyediakan Gambar dan Grafik 2D
3. `import java.awt.*;`  
`import java.awt.event.*;`

```
public class KalkulatorAWT extends Frame {  
    // Komponen yang dibutuhkan  
    private Label lblBil1, lblBil2, lblHasil;  
    private TextField txtBil1, txtBil2, txtHasil;  
    private Button btnTambah, btnClear;  
  
    // Konstruktor  
    public KalkulatorAWT() {  
        setLayout(new FlowLayout());  
  
        // Inisialisasi label  
        lblBil1 = new Label("Bilangan 1:");  
        lblBil2 = new Label("Bilangan 2:");  
        lblHasil = new Label("Hasil:");  
  
        // Inisialisasi text field  
        txtBil1 = new TextField(10);  
        txtBil2 = new TextField(10);  
        txtHasil = new TextField(10);  
        txtHasil.setEditable(false);  
  
        // Inisialisasi tombol  
        btnTambah = new Button("+");  
        btnClear = new Button("Clear");  
  
        // Tambahkan komponen ke Frame  
        add(lblBil1);  
        add(txtBil1);  
        add(lblBil2);  
        add(txtBil2);  
        add(btnTambah);  
        add(lblHasil);  
        add(txtHasil);  
        add(btnClear);  
  
        // Set ukuran Frame  
        setSize(300, 200);  
    }  
}
```

```

setTitle("Kalkulator AWT");
setVisible(true);

// Penanganan peristiwa untuk tombol tambah
btnTambah.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        try {
            // Ambil nilai dari text field
            double bil1 = Double.parseDouble(txtBil1.getText());
            double bil2 = Double.parseDouble(txtBil2.getText());

            // Hitung hasil
            double hasil = bil1 + bil2;

            // Tampilkan hasil
            txtHasil.setText(String.valueOf(hasil));
        } catch (NumberFormatException ex) {
            txtHasil.setText("Invalid Input");
        }
    }
});

// Penanganan peristiwa untuk tombol clear
btnClear.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        txtBil1.setText("");
        txtBil2.setText("");
        txtHasil.setText("");
    }
});

// Menutup aplikasi saat Frame ditutup
addWindowListener(new WindowAdapter() {
    public void windowClosing(WindowEvent we) {
        dispose();
    }
});

// Metode main untuk menjalankan aplikasi
public static void main(String[] args) {
    new KalkulatorAWT();
}
}

```

## Posttest

```
package BP1_M1_posttest_Bayu;
```

```

/**
 *
 * @author bayui
 */

public class BP1_MP1_postetst_Bayu extends javax.swing.JFrame {

    /**
     * Creates new form BP1_MP1_PT1_Rio
     */

    public BP1_MP1_postetst_Bayu() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */

    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        label1 = new java.awt.Label();
        label2 = new java.awt.Label();
        label3 = new java.awt.Label();
        textField1 = new java.awt.TextField();
        textField2 = new java.awt.TextField();
        label4 = new java.awt.Label();
        button1 = new java.awt.Button();
        button2 = new java.awt.Button();
        button3 = new java.awt.Button();
    }

```

```
button4 = new java.awt.Button();
label5 = new java.awt.Label();
textField3 = new java.awt.TextField();

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

label1.setText("Kalkulator Sederhana");

label2.setText("Bilangan 1");

label3.setText("Bilangan 2");

label4.setText("Operator");

button1.setLabel("+");
button1.addMouseListener(new java.awt.event.MouseAdapter() {
    public void mouseClicked(java.awt.event.MouseEvent evt) {
        button1MouseClicked(evt);
    }
});
button1.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        button1ActionPerformed(evt);
    }
});

button2.setLabel("-");
button2.addMouseListener(new java.awt.event.MouseAdapter() {
    public void mouseClicked(java.awt.event.MouseEvent evt) {
        button2MouseClicked(evt);
    }
});
```

```
button2.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        button2ActionPerformed(evt);  
    }  
});
```

```
button3.setLabel("x");  
button3.addMouseListener(new java.awt.event.MouseAdapter() {  
    public void mouseClicked(java.awt.event.MouseEvent evt) {  
        button3MouseClicked(evt);  
    }  
});
```

```
button3.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        button3ActionPerformed(evt);  
    }  
});
```

```
button4.setLabel("/");  
button4.addMouseListener(new java.awt.event.MouseAdapter() {  
    public void mouseClicked(java.awt.event.MouseEvent evt) {  
        button4MouseClicked(evt);  
    }  
});
```

```
button4.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        button4ActionPerformed(evt);  
    }  
});
```

```
label5.setText("Hasil");
```

```

javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
getContentPane().setLayout(layout);
layout.setHorizontalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addGap(36, 36, 36)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING,
false)

            .addComponent(button3, javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)

            .addComponent(button1, javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE, 100, Short.MAX_VALUE))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(button4, javax.swing.GroupLayout.PREFERRED_SIZE,
100, javax.swing.GroupLayout.PREFERRED_SIZE)

            .addComponent(button2, javax.swing.GroupLayout.PREFERRED_SIZE,
100, javax.swing.GroupLayout.PREFERRED_SIZE)))

        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(label2, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

            .addComponent(label3, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

            .addComponent(label5, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)

```

```

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)

        .addComponent(textField3, javax.swing.GroupLayout.DEFAULT_SIZE,
132, Short.MAX_VALUE)

        .addComponent(label4, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

        .addComponent(textField2, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)

        .addComponent(textField1, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))))

        .addGap(54, 54, 54))

.addGroup(layout.createSequentialGroup()

        .addGap(100, 100, 100)

        .addComponent(label1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

        .addContainerGap(94, Short.MAX_VALUE))

);

layout.setVerticalGroup(

    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

        .addGroup(layout.createSequentialGroup()

            .addGap(33, 33, 33)

            .addComponent(label1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

            .addGap(19, 19, 19)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

            .addComponent(textField1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

            .addComponent(label2, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

            .addGap(21, 21, 21)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

            .addGroup(layout.createSequentialGroup()

```



```

        .addComponent(textField2, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

        .addGap(21, 21, 21)

        .addComponent(label4, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addComponent(label3, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

        .addGroup(layout.createSequentialGroup())

            .addGap(12, 12, 12)

            .addComponent(button1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addGroup(layout.createSequentialGroup())

            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

            .addComponent(button2, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)))

        .addGap(22, 22, 22)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

        .addComponent(button3, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

        .addComponent(button4, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addGap(50, 50, 50)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

        .addComponent(label5, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

        .addComponent(textField3, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addContainerGap(30, Short.MAX_VALUE))

);

```

```
    pack();
} // </editor-fold>

private void button4ActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
}

private void button1ActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
}

private void button2ActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
}

private void button3ActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
}

private void button1MouseClicked(java.awt.event.MouseEvent evt) {
    // TODO add your handling code here:
    double bil1, bil2, hasil;
    bil1 = Double.parseDouble(textField1.getText());
    bil2 = Double.parseDouble(textField2.getText());
    hasil = bil1 + bil2;
    textField3.setText(String.valueOf(hasil));
}

private void button2MouseClicked(java.awt.event.MouseEvent evt) {
    // TODO add your handling code here:
    double bil1, bil2, hasil;
```

```

        bil1 = Double.parseDouble(textField1.getText());
        bil2 = Double.parseDouble(textField2.getText());
        hasil = bil1 - bil2;
        textField3.setText(String.valueOf(hasil));
    }

```

```

private void button3MouseClicked(java.awt.event.MouseEvent evt) {
    // TODO add your handling code here:

    double bil1, bil2, hasil;

    bil1 = Double.parseDouble(textField1.getText());
    bil2 = Double.parseDouble(textField2.getText());

    hasil = bil1 * bil2;

    textField3.setText(String.valueOf(hasil));
}

```

```

private void button4MouseClicked(java.awt.event.MouseEvent evt) {
    // TODO add your handling code here:

    double bil1, bil2, hasil;

    bil1 = Double.parseDouble(textField1.getText());
    bil2 = Double.parseDouble(textField2.getText());

    hasil = bil1 / bil2;

    textField3.setText(String.valueOf(hasil));
}

```

```

/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    /* Set the Nimbus look and feel */
    //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
    /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and
feel.

```

```

        * For details see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html

        */

        try {

            for (javax.swing.UIManager.LookAndFeelInfo info :
                javax.swing.UIManager.getInstalledLookAndFeels()) {

                if ("Nimbus".equals(info.getName())) {

                    javax.swing.UIManager.setLookAndFeel(info.getClassName());

                    break;

                }

            }

        } catch (ClassNotFoundException ex) {

            java.util.logging.Logger.getLogger(BP1_MP1_postetst_Bayu.class.getName()).log(java.util.l
                ogging.Level.SEVERE, null, ex);

        } catch (InstantiationException ex) {

            java.util.logging.Logger.getLogger(BP1_MP1_postetst_Bayu.class.getName()).log(java.util.l
                ogging.Level.SEVERE, null, ex);

        } catch (IllegalAccessException ex) {

            java.util.logging.Logger.getLogger(BP1_MP1_postetst_Bayu.class.getName()).log(java.util.l
                ogging.Level.SEVERE, null, ex);

        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

            java.util.logging.Logger.getLogger(BP1_MP1_postetst_Bayu.class.getName()).log(java.util.l
                ogging.Level.SEVERE, null, ex);

        }

        //</editor-fold>

        //</editor-fold>

        /* Create and display the form */

        java.awt.EventQueue.invokeLater() -> {

            new BP1_MP1_postetst_Bayu().setVisible(true);

        });

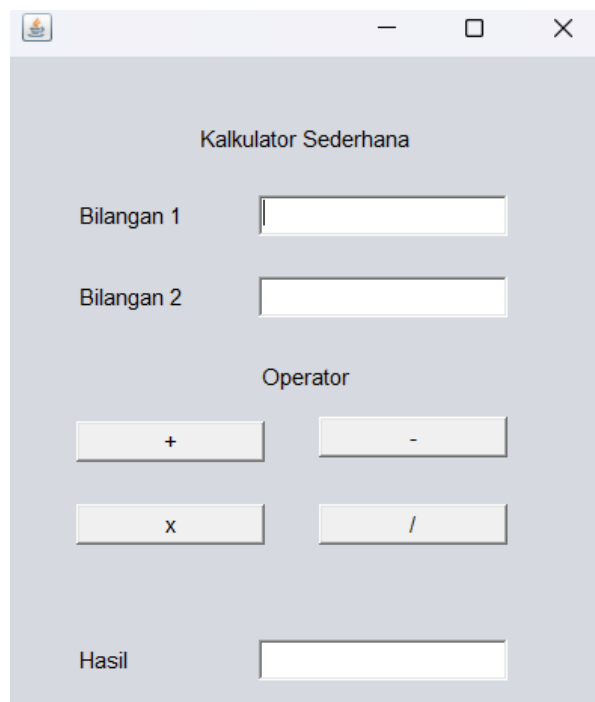
    }

```

```

// Variables declaration - do not modify
private java.awt.Button button1;
private java.awt.Button button2;
private java.awt.Button button3;
private java.awt.Button button4;
private java.awt.Label label1;
private java.awt.Label label2;
private java.awt.Label label3;
private java.awt.Label label4;
private java.awt.Label label5;
private java.awt.TextField textField1;
private java.awt.TextField textField2;
private java.awt.TextField textField3;
// End of variables declaration
}

```



## TUGAS

```
package tugas1;
```

```

/**
 *
 * @author bayui
 */

import javax.swing.*;
import java.awt.event.MouseAdapter;
import java.awt.event.MouseEvent;

public class Tugas1 extends JFrame {
    // Variables declaration

    private JButton button1, button2, button3, button4, button5;
    private JLabel label1, label2, label3, label5;
    private JTextField textField1, textField2, textField3;

    // Constructor

    public Tugas1() {
        initComponents();
    }

    private void initComponents() {
        // Create components

        label1 = new JLabel("Kalkulator Sederhana");
        label2 = new JLabel("Bilangan 1 :");
        label3 = new JLabel("Bilangan 2 :");
        label5 = new JLabel("Hasil :");
        textField1 = new JTextField();
        textField2 = new JTextField();
        textField3 = new JTextField();
        button1 = new JButton("+");
        button2 = new JButton("-");
        button3 = new JButton("x");

```

```
button4 = new JButton("/");
button5 = new JButton("Clear");

// Set layout
setLayout(null);

// Position components
label1.setBounds(80, 20, 150, 30);
label2.setBounds(30, 60, 100, 30);
textField1.setBounds(130, 60, 100, 30);
label3.setBounds(30, 100, 100, 30);
textField2.setBounds(130, 100, 100, 30);

button1.setBounds(30, 140, 50, 30);
button2.setBounds(90, 140, 50, 30);
button3.setBounds(150, 140, 50, 30);
button4.setBounds(210, 140, 50, 30);
button5.setBounds(270, 140, 80, 30);

label5.setBounds(30, 180, 100, 30);
textField3.setBounds(130, 180, 100, 30);

// Add components to frame
add(label1);
add(label2);
add(textField1);
add(label3);
add(textField2);
add(button1);
add(button2);
add(button3);
add(button4);
```

```

add(button5);
add(label5);
add(textField3);

// Set button actions
button1.addActionListener(evt -> calculate('+'));
button2.addActionListener(evt -> calculate('-'));
button3.addActionListener(evt -> calculate('*'));
button4.addActionListener(evt -> calculate('/'));

// Clear fields when mouse enters the "Clear" button area
button5.addMouseListener(new MouseAdapter() {
    @Override
    public void mouseEntered(MouseEvent evt) {
        clearFields();
    }
});

// Frame settings
setTitle("Kalkulator Sederhana");
setSize(400, 300);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
setVisible(true);
}

// Method for calculations
private void calculate(char operator) {
    try {
        double bil1 = Double.parseDouble(textField1.getText());
        double bil2 = Double.parseDouble(textField2.getText());
        double hasil = 0;

```



```

switch (operator) {
    case '+':
        hasil = bil1 + bil2;
        break;
    case '-':
        hasil = bil1 - bil2;
        break;
    case '*':
        hasil = bil1 * bil2;
        break;
    case '/':
        if (bil2 != 0) {
            hasil = bil1 / bil2;
        } else {
            JOptionPane.showMessageDialog(this, "Pembagian dengan nol tidak
diperbolehkan!");
            return;
        }
        break;
}

textField3.setText(String.valueOf(hasil));
} catch (NumberFormatException e) {
    JOptionPane.showMessageDialog(this, "Masukkan angka yang valid!");
}
}

// Method to clear input fields
private void clearFields() {
    textField1.setText("");
    textField2.setText("");
    textField3.setText("");
}

```

```
// Main method

public static void main(String[] args) {

    new Tugas1();

}

}
```

