MODUL IX

GRAPHICAL USER INTERFACE

1. Tujuan

a. Mahasiswa mampu mendefinisikan JFrame menggunakan inheritance.
b. Mahasiswa mampu menulis program Java berbasis event model.
c. Mahasiswa mampu mengatur objek GUI menggunakan layout manager dan nested panel.
d. Mahasiswa mampu menerapkan program aplikasi GUI menggunakan JButton, JLabel, ImageIcon, JTextField, JTextArea, JCheckBox, JRadioButton, JComboBox, JList, dan JSlider dari javax.swing.
e. Mahasiswa menulis program aplikasi GUI yang memproses mouse event.

2. Latihan praktikum

Buat file .java di editor masing-masing, dan lakukan latihan pemrograman yang ditunjukkan setiap nomor.

a) GUI sederhana dengan JOptionPane

```
import javax.swing;

class MessageDialog{
  public static void main(String[] args) {
    JFrame jFrame;

    jFrame = new JFrame();
    jFrame.setSize(400,300);
    jFrame.setVisible(true);

    JOptionPane.showMessageDialog(jFrame, "Bro/Sis, gimana kabarmu?");
    JOptionPane.showMessageDialog(null, "Udah dulu ya!");
  }
}
```

b) Kustomisasi Frame Window

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

class BackGroundBiru extends JFrame{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  public static void main(String[] args) {
    BackGroundBiru frame = new BackGroundBiru();
    frame.setVisible(true);
  }
```

```
  public BackGroundBiru(){

    setTitle("BackGround Biru Pada Program Java GUI");
    setSize(FRAME_WIDTH, FRAME_HEIGHT);
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    setDefaultCloseOperation(EXIT_ON_CLOSE);

    changeBkColor();
  }

  private void changeBkColor(){
    Container contentPane = getContentPane();
    contentPane.setBackground(Color.BLUE);
  }
}
```

c) Dasar Pemrograman GUI

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

class ButtonFrame extends JFrame{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  private static final int BUTTON_WIDTH = 80;
  private static final int BUTTON_HEIGHT = 30;

  private JButton cancelButton;
  private JButton okButton;

  public static void main(String[] args){
    ButtonFrame frame = new ButtonFrame();
    frame.setVisible(true);
  }

  public ButtonFrame(){
    Container contentPane = getContentPane();

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setResizable(false);
    setTitle("Program Button pada Frame");
    setLocation (FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane.setLayout(new FlowLayout());

    okButton = new JButton("OK");
    okButton.setSize(BUTTON_WIDTH, BUTTON_HEIGHT);
    contentPane.add(okButton);

    cancelButton = new JButton("CANCEL");
    cancelButton.setSize(BUTTON_WIDTH, BUTTON_HEIGHT);
    contentPane.add(cancelButton);

    setDefaultCloseOperation(EXIT_ON_CLOSE);
  }
}
```

d) Komponen GUI yang terkait dengan teks

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

class TextFrame extends JFrame implements ActionListener{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  private static final int BUTTON_WIDTH = 80;
  private static final int BUTTON_HEIGHT = 30;

  private JButton cancelButton;
  private JButton okButton;

  private JTextField inputLine;

  public static void main(String[] args){
    TextFrame frame = new TextFrame();
    frame.setVisible(true);
  }

  public TextFrame(){
    Container contentPane;

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setResizable (false);
    setTitle ("Program TextFrame");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane = getContentPane();
    contentPane.setLayout(new FlowLayout());

    inputLine = new JTextField();
    inputLine.setColumns(22);
    contentPane.add(inputLine);

    inputLine.addActionListener(this);

    okButton = new JButton("OK");
    okButton.setSize(BUTTON_WIDTH, BUTTON_HEIGHT);
    contentPane.add(okButton);

    cancelButton = new JButton("CANCEL");
    cancelButton.setSize(BUTTON_WIDTH, BUTTON_HEIGHT);
    contentPane.add(cancelButton);

    cancelButton.addActionListener(this);
    okButton.addActionListener(this);

    setDefaultCloseOperation(EXIT_ON_CLOSE);
  }

  public void actionPerformed(ActionEvent event){
    if(event.getSource() instanceof JButton){
      JButton clickedButton = (JButton) event.getSource();
```

```
        String buttonText = clickedButton.getText();

        setTitle("Tombol " + buttonText + " telah diklik");

      } else {
        setTitle("Kamu telah menginputkan kata " + inputLine.getText() + "----");
      }
    }
  }
```

e) Button event: menampilkan sebuah frame dengan dua tombol dan terkait dengan sebuah instance dari ButtonHandler ke dua buah tombol tersebut.

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

class ButtonHandler implements ActionListener {
  public ButtonHandler() {

  }

  public void actionPerformed(ActionEvent event){
    JButton clickedButton = (JButton) event.getSource();

    JRootPane rootPane = clickedButton.getRootPane();
    Frame frame = (JFrame) rootPane.getParent();

    Sring buttonText = clickedButton.getText();
    frame.setTitle(Tombol + "" + telah diklik);
  }
}
```

f) Program GUI untuk menampilkan sebuah frame dengan dua buah tombol, sebuah *text field*, dan sebuah area teks

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

class TextFrameSelection extends JFrame implements ActionListener{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  private static final int BUTTON_WIDTH = 80;
  private static final int BUTTON_HEIGHT = 30;

  private static final String EMPTY_STRING = "";
  private static final String NEWLINE = System.getProperty("line.separator");

  private JButton clearButton;
  private JButton addButton;
  private JTextField inputLine;
  private JTextArea textArea;

  public static void main(String[] args){
```

```
        TextFrameSelection frame = new TextFrameSelection();
        frame.setVisible(true);
      }

      public TextFrameSelection(){
        Container contentPane;

        setSize(FRAME_WIDTH, FRAME_HEIGHT);
        setResizable(false);
        setTitle("Program Seleksi Teks");
        setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

        contentPane = getContentPane();
        contentPane.setLayout(new FlowLayout());

        textArea = new JTextArea();
        textArea.setColumns(22);
        textArea.setRows(8);
        textArea.setBorder(BorderFactory.createLineBorder(Color.Red));

        textArea.setEditable(false);
        contentPane.add(textArea);

        inputLine = new JTextField();
        inputLine.setColumns(22);
        contentPane.add(inputLine);

        inputLine.addActionListener(this);

        addButton = new JButton("TAMBAH");
        addButton.setSize(BUTTON_WIDTH, BUTTON_HEIGHT);
        contentPane.add(addButton);

        clearButton = new JButton("CLEAR");
        clearButton.setSize(BUTTON_WIDTH, BUTTON_HEIGHT);
        contentPane.add(clearButton);

        clearButton.addActionListener(this);
        addButton.addActionListener(this);

        setDefaultCloseOperation(EXIT_ON_CLOSE);
      }

      public void actionPerformed(ActionEvent event){
        if(event.getSource() instanceof JButton) {
          JButton clickedButton = (JButton) event.getSource();
          if(clickedButton == addButton){
            addText(inputLine.getText());
          }else{
            clearText();
          }else{
            addText(inputLine.getText());
          }
        }
      }

      private void addText(String newline){
        textArea.append(newline = NEWLINE);
        inputLine.setText("");
      }

      private void clearText(){
        textArea.setText(EMPTY_STRING);
```

```
        inputLine.setText(EMPTY_STRING);
      }
    }
```

g) Program GUI: Layout Manager

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

class FlowLayout extends JFrame{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  public static void main(String[] args) {
    FlowLayout frame = new FlowLayout();
    frame.setVisible(true);
  }

  public FlowLayout(){
    Container contentPane;
    JButton tombol1, tombol2, tombol3, tombol4, tombol5;

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setTitle("Program Contoh Flow Layout");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane = getContentPane();
    contentPane.setBackground(Color.WHITE);
    contentPane.setLayout(new FlowLayout());

    tombol1 = new JButton("Tombol 1");
    tombol2 = new JButton("Tombol 2");
    tombol3 = new JButton("Tombol 3");
    tombol4 = new JButton("Tombol 4");
    tombol5 = new JButton("Tombol 5");

    contentPane.add(tombol1);
    contentPane.add(tombol2);
    contentPane.add(tombol3);
    contentPane.add(tombol4);
    contentPane.add(tombol5);

    setDefaultCloseOperation(EXIT_ON_CLOSE);

  }
}
```

h) Program GUI: Border Layout

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

class BorderLayout extends JFrame{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;
```

```
  public static void main(String[] args) {
    BorderLayout frame = new BorderLayout();
    frame.setVisible(true);
  }

  public BorderLayout(){
    Container contentPane;
    JButton tombol1, tombol2, tombol3, tombol4, tombol5;

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setTitle("Program Contoh Border Layout");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane = getContentPane();
    contentPane.setBackground(Color.WHITE);
    contentPane.setLayout(new BorderLayout());

    tombol1 = new JButton("Tombol 1");
    tombol2 = new JButton("Tombol 2");
    tombol3 = new JButton("Tombol 3");
    tombol4 = new JButton("Tombol 4");
    tombol5 = new JButton("Tombol 5");

    contentPane.add(tombol1, BorderLayout.NORTH);
    contentPane.add(tombol2, BorderLayout.SOUTH);
    contentPane.add(tombol3, BorderLayout.EAST);
    contentPane.add(tombol4, BorderLayout.WEST);
    contentPane.add(tombol5, BorderLayout.CENTER);

    setDefaultCloseOperation(EXIT_ON_CLOSE);
  }
}
```

i) Program GUI: Grid Layout

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

class GridLayout extends JFrame{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  public static void main(String[] args) {
    GridLayout frame = new GridLayout();
    frame.setVisible(true);
  }

  public GridLayout() {
    Container contentPane;
    JButton tombol1, tombol2, tombol3, tombol4, tombol5;

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setTitle("Program Contoh Grid Layout");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane = getContentPane();
    contentPane.setBackground(Color.WHITE);
    contentPane.setLayout(new GridLayout(2,3));
```

```
      tombol1 = new JButton("Tombol 1");
      tombol2 = new JButton("Tombol 2");
      tombol3 = new JButton("Tombol 3");
      tombol4 = new JButton("Tombol 4");
      tombol5 = new JButton("Tombol 5");

      contentPane.add(tombol1);
      contentPane.add(tombol2);
      contentPane.add(tombol3);
      contentPane.add(tombol4);
      contentPane.add(tombol5);

      setDefaultCloseOperation(EXIT_ON_CLOSE);
    }
  }
```

j) Program GUI: Posisi absolut

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

class AbsolutePosition extends JFrame{
  private static final int FRAME_WIDTH = 300;
  private static final int FRAME_HEIGHT = 200;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  private static final int BUTTON_WIDTH = 80;
  private static final int BUTTON_HEIGHT = 30;

  private JButton cancelButton;
  private JButton okButton;

  public static void main(String[] args) {
    AbsolutePosition frame = new AbsolutePosition();
    frame.setVisible(true);
  }

  public AbsolutePosition(){
    Container contentPane;
    JButton tombol1, tombol2, tombol3, tombol4, tombol5;

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setTitle("Program Contoh Flow Layout");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane.setLayout(null);
    contentPane.setBackground(Color.WHITE);

    okButton = new JButton("OK");
    okButton.setBounds(70, 25, BUTTON_WIDTH, BUTTON_HEIGHT);
    contentPane.add(okButton);

    cancelButton = new JButton("CANCEL");
    cancelButton.setBounds(160, 25, BUTTON_WIDTH, BUTTON_HEIGHT);
    contentPane.add(cancelButton);

    setDefaultCloseOperation(EXIT_ON_CLOSE);
  }
}
```

k) Program GUI: Panel bersarang (*nested panels*)

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

class NestedPanel1 extends JFrame{
  private static final int FRAME_WIDTH = 500;
  private static final int FRAME_HEIGHT = 350;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  public static void main(String[] args) {
    NestedPanel1 frame = new NestedPanel1();
    frame.setVisible(true);
  }

  public NestedPanel1(){
    Container contentPane;
    PingDolPanel gamePanel;
    JPanel controlPanel;
    JPanel scorePanel;

    setSize (FRAME_WIDTH, FRAME_HEIGHT);
    setTitle("Program Panel Bersarang");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane= getContentPane();
    contentPane.setLayout(new BorderLayout(10,0));

    gamePanel = new PingDolPanel();
    gamePanel.setBorder(BorderFactory.createLoweredBevelBorder());
    controlPanel = new JPanel();
    controlPanel.setLayout(new BorderLayout());

    contentPane.add(gamePanel, BorderLayout.CENTER);
    contentPane.add(controlPanel, BorderLayout.EAST);

    scorePanel = new JPanel();
    scorePanel.setBorder(BorderFactory.createTitledBorder("Skor: "));

    scorePanel.setLayout(new GridLayout(2,2));
    scorePanel.add(new JLabel("Player 1: "));
    scorePanel.add(new JLabel("       0"));
    scorePanel.add(new JLabel("Player 2: "));
    scorePanel.add(new JLabel("       0"));

    controlPanel.add(scorePanel, BorderLayout.NORTH);
    controlPanel.add(new JButton("New Game"), BorderLayout.SOUTH);

    setDefaultCloseOperation(EXIT_ON_CLOSE);
  }
}
```

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

class NestedPanel2 extends JFrame{
  private static final int FRAME_WIDTH = 500;
```

```
  private static final int FRAME_HEIGHT = 350;
  private static final int FRAME_X_ORIGIN = 150;
  private static final int FRAME_Y_ORIGIN = 250;

  private final String ENTER = "Enter";
  private final String CANCEL = "Cancel";
  private final String BLANK = "";

  public static void main(String[] args) {
    NestedPanel2 frame = new NestedPanel2();
    frame.setVisible(true);
  }

  public NestedPanel2(){
    JPanel guessPanel, hintPanel, controlPanel, buttonPanel;
    JButton enterBtn, cancelBtn;
    Container contentPane;

    setSize(FRAME_WIDTH, FRAME_HEIGHT);
    setTitle("Program Panel Bersarang");
    setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

    contentPane = getContentPane();

    contentPane.setLayout(new GridLayout(3,1));

    guessPanel = new JPanel();
    guessPanel.setBorder(BorderFactory.createTitledBorder("Your Guess"));
    guessPanel.add(guessEntry = new JTextField(10));

    hintPanel = new JPanel();
    hintPanel.setBorder(BorderFactory.createTitledBorder("Petunjuk"));
    hintPanel.add(hint = new JLabel("Permainan"));

    controlPanel = new JPanel(new BorderLayout());
    buttonPanel = new JPanel();
    buttonPanel.add(enterBtn = new JButton(ENTER));
    buttonPanel.add(cancelBtn = new JButton(CANCEL));
    controlPanel.add(buttonPanel, BorderLayout.SOUTH);

    contentPane.add(guessPanel);
    contentPane.add(hintPanel);
    contentPane.add(controlPanel);
  }


}
```

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

public class PingDol extends JPanel{
  public static enum Image{BLANK, CIRCLE, CROSS}
  private static final String CROSS_IMAGE_FILE = "ping.gif";
  private static final String CIRCLE_IMAGE_FILE = "dol.gif";
  private static final String BLANK_IMAGE_FILE = "blank.gif";

  private JLabel content;
  private Point location;

  public PingDol(){
```

```
    this(null);
  }

  public PingDol(Point pt){
    ImageIcon initImage = new ImageIcon("blank.gif");

    setLayout(new BorderLayout());
    setBackground(Color.WHITE);
    setBorder(BorderFactory.createLineBorder(Color.BLACK));

    content = new JLabel(initImage);
    add(content);

    location = pt;
  }


  public Point getPosition(){
    return location;
  }

  public void setContent(Image image){
    switch(image){
      case CIRCLE: content.setIcon(new ImageIcon(CIRCLE_IMAGE_FILE));
      break;
      case CROSS: content.setIcon(new ImageIcon(CROSS_IMAGE_FILE)); break;
      default: break;
    }
  }
}
```

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

public class PingDolPanel extends JPanel implements MouseListener{
  private boolean circle;

  public PingDolPanel() {
    this(3);
  }

  public PingDolPanel(int size){
    PingDolPanel cell;

    setLayout(new GridLayout(size, size));

    for (int row=0; row < size; row++){
      for (int col= 0; col < size; col++){
        cell = new PingDol();

        cell.addMouseListener(this);
        add(cell);
      }
    }


    circle = true;
  }

  public void mouseClicked(MouseEvent event){
```

```
    PingDol cell = (PingDol) event.getSource();

    if(circle){
      cell.setContent(PingDol.Image.CIRCLE);
    } else {
      cell.setContent(PingDol.Image.CROSS);
    }
    circle = !circle;
  }

  public void mouseEntered (MouseEvent event) {}
    public void mouseExited (MouseEvent event) {}
      public void mousePressed (MouseEvent event) {}
        public void mouseReleased (MouseEvent event) {}
}
```

l) Program GUI: Check box

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

  class CheckBox1 extends JFrame implements ActionListener{
    private static final int FRAME_WIDTH = 300;
    private static final int FRAME_HEIGHT = 200;
    private static final int FRAME_X_ORIGIN = 150;
    private static final int FRAME_Y_ORIGIN = 250;

    private JCheckBox[] checkBox;

    public static void main(String[] args) {
      CheckBox1 frame = new CheckBox1();
      frame.setVisible(true);
    }

    public CheckBox1(){
      Container contentPane;
      JPanel checkPanel, okPanel;

      JButton okButton;
      String[] btnText = ["Java", "C++", "Phyton", "Pascal"];

      setSize(FRAME_WIDTH, FRAME_HEIGHT);
      setTitle("Program Check Box");
      setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

      contentPane = getContentPane();
      contentPane.setBackground(Color.WHITE);
      contentPane.setLayout(new BorderLayout());

      checkPanel = new JPanel(new GridLayout(0,1));
      checkPanel.setBorder(BorderFactory.createTitledBorder("Program Masuk??"));
      checkBox = new JCheckBox[btnText.length];

      for (int i = 0; i < checkBox.length; i++){
        checkBox[1] = new JCheckBox(btnText[1]);
        checkPanel.add(checkBox[1]);
      }

      okPanel = new JPanel(new FlowLayout());
      okButton = new JButton("OK");
```

```
        okButton.addActionListener(this);
        okPanel.add(okButton);

        contentPane.add(checkPanel, BorderLayout.CENTER);
        contentPane.add(okPanel, BorderLayout.SOUTH);

        setDefaultCloseOperation(EXIT_ON_CLOSE);

      }

      public void actionPerformed(ActionEvent event) {
        StringBuffer skill = new ("Dapat diprogram in \n");
        for (int i = 0; i < checkBox.length; i++){
          if(checkBox[1].isSelected()){
            skill.append(checkBox[1].getText() + "\n");
          }
        }
        JOptionPane.showMessageDialog(this, skill.toString());
      }


    }
```

m) Program GUI: Check box 2

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

    class CheckBox2 extends JFrame implements ActionListener, ItemListener{
      private static final int FRAME_WIDTH = 300;
      private static final int FRAME_HEIGHT = 200;
      private static final int FRAME_X_ORIGIN = 150;
      private static final int FRAME_Y_ORIGIN = 250;

      private JCheckBox[] checkBox;

      public static void main(String[] args) {
        CheckBox2 frame = new CheckBox2();
        frame.setVisible(true);
      }

      public CheckBox2(){
        Container contentPane;
        JPanel checkPanel, okPanel;

        JButton okButton;
        String[] btnText = ["Java", "C++", "Phyton", "Pascal"];

        setSize(FRAME_WIDTH, FRAME_HEIGHT);
        setTitle("Program Check Box");
        setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

        contentPane = getContentPane();
        contentPane.setBackground(Color.WHITE);
        contentPane.setLayout(new BorderLayout());

        checkPanel = new JPanel(new GridLayout(0,1));
        checkPanel.setBorder(BorderFactory.createTitledBorder("Program Masuk??"));
        checkBox = new JCheckBox[btnText.length];
```

```
        for (int i = 0; i < checkBox.length; i++){
          checkBox[1] = new JCheckBox(btnText[1]);
          checkPanel.add(checkBox[1]);
        }

        okPanel = new JPanel(new FlowLayout());
        okButton = new JButton("OK");
        okButton.addActionListener(this);
        okPanel.add(okButton);

        contentPane.add(checkPanel, BorderLayout.CENTER);
        contentPane.add(okPanel, BorderLayout.SOUTH);

        setDefaultCloseOperation(EXIT_ON_CLOSE);

      }

      public void actionPerformed(ActionEvent event) {
        StringBuffer skill = new ("Dapat diprogram in \n");
        for (int i = 0; i < checkBox.length; i++){
          if(checkBox[1].isSelected()){
            skill.append(checkBox[1].getText() + "\n");
          }
        }
        JOptionPane.showMessageDialog(this, skill.toString());
      }

      public void itemStateChanged(ItemEvent event) {
        JCheckBox source = (JCheckBox) event.getSource();

        String state;

        if(event.getStateChange() == ItemEvent.SELECTED){
          state = "enable";
        } else {
          state = "disable"
        }
        JOptionPane.showMessageDialog(this, "JCheckBox " + source.getText() + "" +
    state);
      }


    }
```

n) Program GUI: Radio button

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

    class RadioButtonSample extends JFrame implements ActionListener, ItemListener{
      private static final int FRAME_WIDTH = 300;
      private static final int FRAME_HEIGHT = 200;
      private static final int FRAME_X_ORIGIN = 150;
      private static final int FRAME_Y_ORIGIN = 250;

      private JRadioButton[] redioButton;

      public static void main(String[] args) {
        RadioButtonSample frame = new RadioButtonSample();
        frame.setVisible(true);
```

```
    }

    public RadioButtonSample() {
      Container contentPane;
      JPanel radioPanel, okPanel;
      ButtonGroup languageGroup;

      JButton okButton;
      String[] btnText = ["Java", "C++", "Python", "Pascal"];

      setSize(FRAME_WIDTH, FRAME_HEIGHT);
      setTitle("Program Radio Button");
      setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);

      contentPane = getContentPane();
      contentPane.setBackground(Color.WHITE);
      contentPane.setLayout(new BorderLayout);

      radioPanel = new JPanel(new GridLayout(0,1));
      radioPanel.setBorder(BorderFactory.createTitledBorder("Pilih bahasa pemrograman
yang dikuasai:"));

      languageGroup = new ButtonGroup();
      radioButton = new JRadioButton[btnText.length];

      for(int i =0; i < radioButton.length; i++){
        radioButton[1] = new JRadioButton(btnText[1]);
        radioButton[1].addItemListener(this);
        languageGroup.add(radioButton[1]);
        radioPanel.add(radioButton[1]);
      }

      radioButton[0].setSelected(true);

      okPanel = new JPanel(new FlowLayout());
      okButton = new JButton("OK");
      okButton.addActionListener(this);
      okPanel.add(okButton);

      contentPane.add(radioPanel, BorderLayout.CENTER);
      contentPane.add(okPanel, BorderLayout.SOUTH);

      setDefaultCloseOperation(EXIT_ON_CLOSE);

    }

    public void actionPerformed(ActionEvent event) {
      String favorite = null;

      int i = 0;
      while (favorite == null) {
        if(radioButton[1].isSelected()){
          favorite = radioButton[1].getText();
        }
        i++
      }
      JOptionPane.showMessageDialog(this, "Bahasa pemrograman pilihan kamu adalah: "
+ favorite);
    }

    public void itemStateChanged(ItemEvent event){
      JRadioButton source = (JRadioButton) event.getSource();
```

```
        String state;

        if (event.getStateChange() == ItemEvent.SELECTED) {
          state = " dipilih";
        } else {
          state = "dikeluarkan dari pilihan"
        }
        JOptionPane.showMessageDialog(this, "JRadioButton " + source.getText() + "" +
    state);
      }
    }
```

o) Program GUI: Combo box

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

    class ComboBox extends JFrame implements ActionListener, ItemListener {
          private static final int FRAME_WIDTH = 300;
          private static final int FRAME_HEIGHT = 200;
          private static final int FRAME_X_ORIGIN = 150;
          private static final int FRAME_Y_ORIGIN = 250;
          private JComboBox comboBox;
          public static void main(String[] args) {
              ComboBox frame = new ComboBox();
              frame.setVisible(true);
          }
          public ComboBox() {
              Container contentPane;
              JPanel comboPanel, okPanel;
              JButton okButton;
              String[] comboBoxItem = {"Java", "C++", "Python", "Pascal"};

              setSize (FRAME_WIDTH, FRAME_HEIGHT);
              setTitle ("Program Ch14JComboBoxSample");
              setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);
              contentPane = getContentPane( );
              contentPane.setBackground(Color.WHITE);
              contentPane.setLayout(new BorderLayout());

              comboPanel = new JPanel(new FlowLayout());
              comboPanel.setBorder(BorderFactory.createTitledBorder("Pick your
    favorite"));
              comboBox = new JComboBox(comboBoxItem);
              comboBox.addItemListener(this);
              comboPanel.add(comboBox);

              okPanel = new JPanel(new FlowLayout());
              okButton = new JButton("OK");
              okButton.addActionListener(this);
              okPanel.add(okButton);
              contentPane.add(comboPanel, BorderLayout.CENTER);
              contentPane.add(okPanel, BorderLayout.SOUTH);
              setDefaultCloseOperation(EXIT_ON_CLOSE);
          }
          public void actionPerformed(ActionEvent event) {
              String favorite;
              int loc;
              favorite = (String) comboBox.getSelectedItem();
              loc = comboBox.getSelectedIndex();
```

```
            JOptionPane.showMessageDialog(this, "Currently selected item '" +
favorite + "' is at index position " + loc);
      }
      public void itemStateChanged(ItemEvent event) {
          String state;
          if (event.getStateChange() == ItemEvent.SELECTED) {
                state = "dipilih ";
          } else {
                state = "tidak dipilih ";
          }
          JOptionPane.showMessageDialog(this, "JComboBox Item '" + event.getItem()
+ "' " + state);
      }
}
```

p) Program GUI: Slider

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

class JavaSlider extends JFrame implements ChangeListener {
    private static final int FRAME_WIDTH = 450;
    private static final int FRAME_HEIGHT = 250;
    private static final int FRAME_X_ORIGIN = 150;
    private static final int FRAME_Y_ORIGIN = 250;
    private static final int MIN_COLOR = 0;
    private static final int MAX_COLOR = 255;
    private JSlider redSlider;
    private JSlider greenSlider;
    private JSlider blueSlider;
    private JPanel colorPanel;
    public static void main(String[] args) {
            JavaSlider frame = new JavaSlider();
            frame.setVisible(true);
    }
    public JavaSlider( ) {
            Container contentPane;
            JPanel sliderPanel;

            setSize (FRAME_WIDTH, FRAME_HEIGHT);
            setTitle ("Program Contoh List");
            setLocation(FRAME_X_ORIGIN, FRAME_Y_ORIGIN);
            contentPane = getContentPane();
            contentPane.setBackground(Color.WHITE);
            contentPane.setLayout(new BorderLayout());

            sliderPanel = new JPanel(new FlowLayout());
            sliderPanel.setBorder(BorderFactory.createTitledBorder("RGB Color
Selection"));
            redSlider = createSlider(MAX_COLOR);
            greenSlider = createSlider(MAX_COLOR);
            blueSlider = createSlider(MAX_COLOR);
            sliderPanel.add(redSlider);
            sliderPanel.add(greenSlider);
            sliderPanel.add(blueSlider);
            colorPanel = new JPanel( );
            colorPanel.setBackground(Color.white);
            colorPanel.setBorder(BorderFactory.createLoweredBevelBorder());
            contentPane.add(colorPanel, BorderLayout.CENTER);
            contentPane.add(sliderPanel, BorderLayout.WEST);
```

```
                setDefaultCloseOperation(EXIT_ON_CLOSE);
        }
        public void stateChanged(ChangeEvent event) {
                int R, G, B;
                R = redSlider.getValue();
                G = greenSlider.getValue();
                B = blueSlider.getValue();
                colorPanel.setBackground(new Color(R, G, B));
        }
        private JSlider createSlider(int value) {
                JSlider slider = new JSlider();
                slider.setOrientation(JSlider.VERTICAL);
                slider.setPaintLabels(true);
                slider.setPaintTicks(true);
                slider.setMinimum(MIN_COLOR);
                slider.setMaximum(MAX_COLOR);
                slider.setValue(value);
                slider.setMajorTickSpacing(50);
                slider.setMinorTickSpacing(25);
                slider.addChangeListener(this);
                return slider;
        }
    }
```

q) Program GUI: Mouse Events

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

    class TrackMouse extends JFrame implements MouseListener {
        private static final int FRAME_WIDTH = 450;
        private static final int FRAME_HEIGHT = 300;
        private static final int FRAME_X_ORIGIN = 150;
        private static final int FRAME_Y_ORIGIN = 250;
        private static final int DOUBLE_CLICK = 2;
        private PrintStream output;


        public static void main(String[] args) {
            TrackMouse frame = new TrackMouse();
            frame.setVisible(true);
        }
        public TrackMouse() {

            setTitle ("TrackMouseFrame");
            setSize (FRAME_WIDTH, FRAME_HEIGHT);
            setResizable(false);
            setLocation (FRAME_X_ORIGIN, FRAME_Y_ORIGIN);
            setDefaultCloseOperation(EXIT_ON_CLOSE);


            output = System.out;

            addMouseListener(this);
        }
        public void mouseClicked(MouseEvent event) {
            if (event.getClickCount() == DOUBLE_CLICK) {
```

```
                System.exit(0);
            } else {
                int x, y;
                x = event.getX();
                y = event.getY();
                output.println("[" + x + "," + y + "]");
            }
        }
            public void mouseEntered (MouseEvent event) { }
            public void mouseExited (MouseEvent event) { }
            public void mousePressed (MouseEvent event) {
            output.println("Down");
            }
            public void mouseReleased(MouseEvent event) {
            output.println ("Up");
        }
    }
```

r) Program GUI: Mouse Event 2

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

class SketchPad extends JFrame implements MouseListener, MouseMotionListener {
    private static final int FRAME_WIDTH = 450;
    private static final int FRAME_HEIGHT = 300;
    private static final int FRAME_X_ORIGIN = 150;
    private static final int FRAME_Y_ORIGIN = 250;
    private int last_x;
    private int last_y;


    public static void main(String[] args) {
        SketchPad frame = new SketchPad();
        frame.setVisible(true);
    }
    public SketchPad() {

        setTitle ("Chapter 14 SketchPad");
        setSize (FRAME_WIDTH, FRAME_HEIGHT);
        setResizable(false);
        setLocation (FRAME_X_ORIGIN, FRAME_Y_ORIGIN);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        last_x = last_y = 0;
        addMouseListener(this);
        addMouseMotionListener(this);
    }


    public void mousePressed(MouseEvent event) {
        int x = event.getX();
        int y = event.getY();
        if (event.isMetaDown()) {

            Graphics g = getGraphics();
            Rectangle r = getBounds();
            g.clearRect(0, 0, r.width, r.height);
            g.dispose();
        } else {
```

```
                last_x = x;
                last_y = y;
            }
        }
        public void mouseClicked (MouseEvent event) { }
        public void mouseEntered (MouseEvent event) { }
        public void mouseExited (MouseEvent event) { }
        public void mouseReleased(MouseEvent event) { }


        public void mouseDragged(MouseEvent event) {
            int x = event.getX();
            int y = event.getY();
            if (!event.isMetaDown()) {

              Graphics g = getGraphics();
              g.drawLine(last_x, last_y, x, y);
              g.dispose();
              last_x = x;
              last_y = y;
            }
        }
        public void mouseMoved (MouseEvent event) { }
    }
```

3. Tugas Praktikum

1) Buatlah program database berbasis GUI dengan ketentuan program tersebut merupakan program data karyawan yang memuat nomor induk karyawan (int 15, primary key, not null), nama karyawan (varchar 40), dan tanggal lahir (date – dd/mm/yyyy). Program tersebut mampu menambah isian data dan menghapus data!
2) Pada soal nomor 1, tampilkan screenshot database dan tabel yang dibuat pada laporan!