

# LAPORAN AWAL

# LAPORAN PEMROGRAMAN I

## LAPORAN KE-2



Disusun Oleh :

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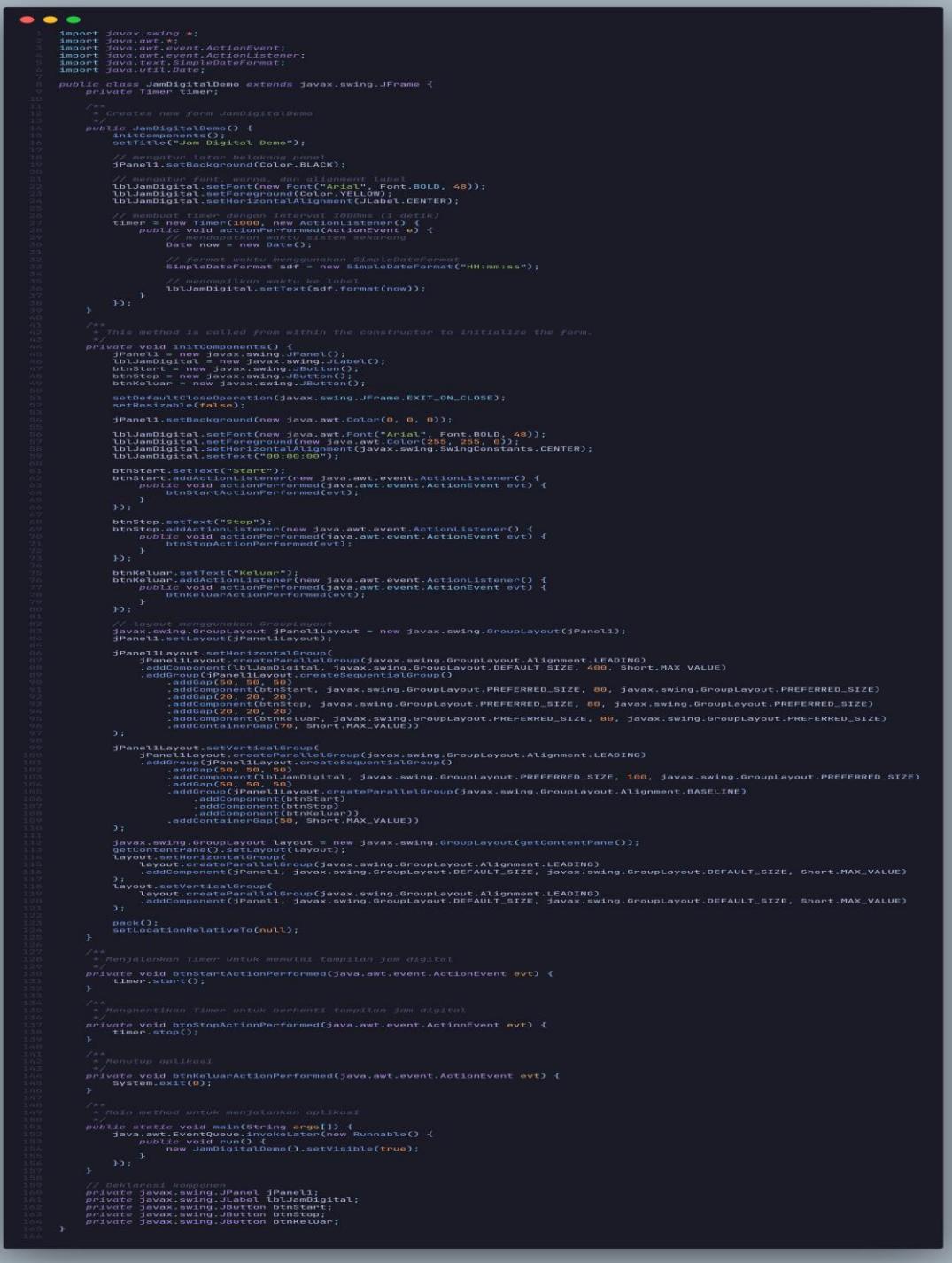
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## Link GITHUB Repo:

<https://github.com/NeiaKI/Belajar-Coding/tree/main/Pemrograman-1%20Kuliah-Java/Pertemuan%202013>

## Code JAM DIGITAL



```

1 import javax.swing.*;
2 import java.awt.*;
3 import java.awt.event.ActionEvent;
4 import java.awt.event.ActionListener;
5 import java.text.SimpleDateFormat;
6 import java.util.Date;
7
8 public class JamdigitalDemo extends javax.swing.JFrame {
9     private Timer timer;
10
11     // Creates new form JamdigitalDemo
12
13     public JamdigitalDemo() {
14         initComponents();
15         setTitle("Jam Digital Demo");
16         setLayout(new BorderLayout());
17         setMinimumSize(new Dimension(250, 100));
18         JPanel jPanel1 = new JPanel();
19         jPanel1.setBackground(Color.BLACK);
20         // membuat font warna dan alignment type
21         lblJamdigital.setFont(new Font("Arial", Font.BOLD, 48));
22         lblJamdigital.setOpaque(true);
23         lblJamdigital.setAlignment(Label.CENTER);
24         lblJamdigital.setForeground(Color.WHITE);
25         // membuat timer dengan interval 1000 ms (1 detik)
26         timer = new Timer(1000, new ActionListener() {
27             public void actionPerformed(ActionEvent e) {
28                 Date now = new Date();
29                 // format waktu menggunakan SimpleDateFormat
30                 SimpleDateFormat sdf = new SimpleDateFormat("HH:mm:ss");
31                 String time = sdf.format(now);
32                 ldtJamDigital.setText(sdf.format(now));
33             }
34         });
35     }
36
37     /**
38      * This method is called from within the constructor to initialize the form.
39      */
40     private void initComponents() {
41         jPanel1 = new JPanel();
42         lblJamdigital = new javax.swing.JLabel();
43         btnStart = new javax.swing.JButton();
44         btnStop = new javax.swing.JButton();
45         btnKeluar = new javax.swing.JButton();
46
47         setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
48         setResizable(false);
49
50         jPanel1.setBackground(new java.awt.Color(0, 0, 0));
51         lblJamdigital.setFont(new java.awt.Font("Arial", Font.BOLD, 48));
52         lblJamdigital.setForeground(new java.awt.Color(255, 255, 0));
53         lblJamdigital.setAlignment(javax.swing.SwingConstants.CENTER);
54         lblJamdigital.setText("00:00:00");
55
56         btnStart.setText("Start");
57         btnStart.addActionListener(new java.awt.event.ActionListener() {
58             public void actionPerformed(java.awt.event.ActionEvent evt) {
59                 btnStartActionPerformed(evt);
60             }
61         });
62
63         btnStop.setText("Stop");
64         btnStop.addActionListener(new java.awt.event.ActionListener() {
65             public void actionPerformed(java.awt.event.ActionEvent evt) {
66                 btnStopActionPerformed(evt);
67             }
68         });
69
70         btnKeluar.setText("Keluar");
71         btnKeluar.addActionListener(new java.awt.event.ActionListener() {
72             public void actionPerformed(java.awt.event.ActionEvent evt) {
73                 btnKeluarActionPerformed(evt);
74             }
75         });
76
77         // layout menggunakan GroupLayout
78         javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
79         jPanel1.setLayout(jPanel1Layout);
80
81         jPanel1Layout.setHorizontalGroup(
82             jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
83                 .addGroup(jPanel1Layout.createSequentialGroup()
84                     .addComponent(lblJamdigital, javax.swing.GroupLayout.PREFERRED_SIZE, 400, Short.MAX_VALUE)
85                     .addGap(10, 10, 10)
86                     .addComponent(btnStart, javax.swing.GroupLayout.PREFERRED_SIZE, 80, javax.swing.GroupLayout.PREFERRED_SIZE)
87                     .addGap(20, 20, 20)
88                     .addComponent(btnStop, javax.swing.GroupLayout.PREFERRED_SIZE, 80, javax.swing.GroupLayout.PREFERRED_SIZE)
89                     .addGap(20, 20, 20)
90                     .addComponent(btnKeluar, javax.swing.GroupLayout.PREFERRED_SIZE, 80, javax.swing.GroupLayout.PREFERRED_SIZE)
91                     .addGap(10, 10, 10)
92                 )
93             );
94
95         jPanel1Layout.setVerticalGroup(
96             jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
97                 .addGroup(jPanel1Layout.createSequentialGroup()
98                     .addContainerGap()
99                     .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
100                         .addComponent(lblJamdigital, javax.swing.GroupLayout.PREFERRED_SIZE, 100, javax.swing.GroupLayout.PREFERRED_SIZE)
101                         .addComponent(btnStart, javax.swing.GroupLayout.PREFERRED_SIZE, 40, javax.swing.GroupLayout.PREFERRED_SIZE)
102                         .addComponent(btnStop, javax.swing.GroupLayout.PREFERRED_SIZE, 40, javax.swing.GroupLayout.PREFERRED_SIZE)
103                         .addComponent(btnKeluar, javax.swing.GroupLayout.PREFERRED_SIZE, 40, javax.swing.GroupLayout.PREFERRED_SIZE)
104                         .addGap(10, 10, 10)
105                     )
106                     .addContainerGap())
107             );
108
109         getContentPane().setLayout(layout);
110         layout.setHorizontalGroup(
111             layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
112                 .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
113         );
114
115         pack();
116         setLocationRelativeTo(null);
117
118         // Mengalihkan Timer untuk memulai tampilan jam digital
119         private void btnStartActionPerformed(java.awt.event.ActionEvent evt) {
120             timer.start();
121         }
122
123         // Menghentikan Timer untuk berhenti tampilan jam digital
124         private void btnStopActionPerformed(java.awt.event.ActionEvent evt) {
125             timer.stop();
126         }
127
128         // Menutup aplikasi
129         private void btnKeluarActionPerformed(java.awt.event.ActionEvent evt) {
130             System.exit(0);
131         }
132
133         /**
134          * Main method untuk menjalankan aplikasi
135          */
136         public static void main(String args[]) {
137             java.awt.EventQueue.invokeLater(new Runnable() {
138                 public void run() {
139                     new JamdigitalDemo().setVisible(true);
140                 }
141             });
142         }
143
144         /**
145          * Deklarasi Komponen
146         */
147         private javax.swing.JPanel jPanel1;
148         private javax.swing.JLabel lblJamdigital;
149         private javax.swing.JButton btnStart;
150         private javax.swing.JButton btnStop;
151         private javax.swing.JButton btnKeluar;
152     }
153
154 }
```

## OUTPUT:



The screenshot shows a Java IDE interface with the following details:

- Top Bar:** Shows tabs 1, 2, 3, 4, 5, 6, 7, and a date/time indicator Friday 14:59 2°c.
- Toolbar:** Includes File, Edit, Selection, View, Go, Run, and other standard icons.
- Search Bar:** Contains the text "Belajar-Coding".
- Left Sidebar:** Displays a tree view titled "Pemrograman-1 Kuliah-Java > Pertemuan 13" with a file named "Jam-Digital.java" expanded.
- Code Editor:** Shows the source code for "Jam-Digital.java". The code initializes a digital clock with the time set to 14:59:12.
- Preview Area:** A window displays the digital clock face with the time 14:59:12.
- Bottom Navigation:** Includes PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and PORTS.
- File Explorer:** Shows a list of files in the current directory, including "Animasi-Teks.java", "Animasi Teks.java", "Jam-Digital.java", "Jam Digital.java", "JAVAGUIDEINNANETBEANS.pdf", "Stop-Watch.java", and "Stop Watch.java".
- Terminal:** Shows the command ".../Pemrograman-1 Kuliah-Java/Pertemuan 13 main ?" followed by the output of the file listing.
- Status Bar:** Shows the file name "main.java", line number "Ln 166", column "Col 1", spaces "Spaces: 4", encoding "UTF-8", file type "Java", and a "Pretty" button.

## PENJELASAN:

- GUI Java Swing: Kode ini mendefinisikan sebuah kelas TampilanTimer yang merupakan turunan dari JFrame, digunakan untuk membuat jendela aplikasi berbasis grafis.
  - Objek Timer: Di dalam konstruktor, sebuah objek Timer dibuat dan diatur dengan interval 1000 milidetik (1 detik).
  - Logika Counter: Setiap kali timer berdetak (per detik), program akan:
    - Menambah variabel counter sebesar 1.
    - Memperbarui teks pada label (jLabel1) untuk menampilkan nilai counter terbaru ("Counter : [angka]").
  - Tombol Mulai: Terdapat event handler jButton1ActionPerformed. Saat tombol diklik, perintah timer.start() dijalankan untuk memulai proses penghitungan waktu.
  - Pengaturan Layout: Metode initComponents() (kode yang digenerate otomatis oleh IDE seperti NetBeans) bertugas mengatur posisi tombol, label, ukuran jendela, dan tata letak (layout) aplikasi.
  - Metode Main: Titik awal program yang membuat dan menampilkan jendela aplikasi TampilanTimer agar terlihat di layar.
  - Format Waktu: Waktu mentah diformat menjadi pola "HH:mm:ss" (Jam:Menit:Detik) menggunakan kelas SimpleDateFormat sebelum ditampilkan ke label.

- Fungsi Tombol:
    - Start: Memanggil timer.start() untuk mulai menjalankan jam.
    - Stop: Memanggil timer.stop() untuk membekukan waktu (jeda).
    - Keluar: Memanggil System.exit(0) untuk menutup program sepenuhnya.

## Code STOP WATCH:

```
btnReset.setEnabled(false);

setWaktu();

}

/***
 * Mengatur format waktu dan tampilan label
 */

private void setWaktu() {

lblWaktu.setFont(new Font("Arial", Font.BOLD, 48));
lblWaktu.setForeground(Color.YELLOW);
lblWaktu.setText("00:00:00.0"); // Mulai dari 00:00:00.0
lblWaktu.setHorizontalAlignment(JLabel.CENTER);

}

/***
 * Memulai stop watch
 */

public void start() {

if (isRunning == false) {

startTime = System.currentTimeMillis();

} else {

startTime = System.currentTimeMillis() - (pauseTime - startTime);

}

isRunning = true;

timer.start();

}

/***
 * Menjeda stop watch
 */
}
```

```
public void pause() {  
  
    pauseTime = System.currentTimeMillis();  
  
    timer.stop();  
  
}  
  
/**  
  
 * Mereset stop watch  
  
 */  
  
public void reset() {  
  
    startTime = 0;  
  
    isRunning = false;  
  
    timer.stop();  
  
    lblWaktu.setText("00:00:00.0"); // Reset ke 00:00:00.  
  
    btnStart.setText(Start);  
  
}  
  
/**  
  
 * Memformat waktu menjadi format HH:MM:SS.ms  
  
 */  
  
private String formatWaktu(final long time) {  
  
    final long hr = TimeUnit.MILLISECONDS.toHours(time);  
  
    final long min = TimeUnit.MILLISECONDS.toMinutes(time -  
  
        TimeUnit.HOURS.toMillis(hr));  
  
    final long sec = TimeUnit.MILLISECONDS.toSeconds(time -  
  
        TimeUnit.HOURS.toMillis(hr) -  
  
        TimeUnit.MINUTES.toMillis(min));  
  
    final long ms = TimeUnit.MILLISECONDS.toMillis(time -  
  
        TimeUnit.HOURS.toMillis(hr) -  
  
        TimeUnit.MINUTES.toMillis(min) -  
  
        TimeUnit.SECONDS.toMillis(sec));  
}
```

```
        return String.format("%02d:%02d:%02d.%01d", hr, min, sec, ms/100);

    }

    /**
     * Mendapatkan waktu saat ini
     */
    private String getCurrentTime(long time) {
        return formatWaktu(time);
    }

    /**
     * Inner class untuk mendengarkan event Timer
     */
    class WaktuListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            lblWaktu.setText(getCurrentTime(System.currentTimeMillis() - startTime));
        }
    }

    /**
     * This method is called from within the constructor to initialize the form.
     */
    private void initComponents() {
        JPanel1 = new javax.swing.JPanel();
        lblWaktu = new javax.swing.JLabel();
        btnReset = new javax.swing.JButton();
        btnStart = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.JFrame.EXIT_ON_CLOSE);
```

```
setResizable(false);

jPanel1.setBackground(new java.awt.Color(0, 0, 0));

lblWaktu.setFont(new java.awt.Font("Arial", Font.BOLD, 48));
lblWaktu.setForeground(new java.awt.Color(255, 255, 0));
lblWaktu.setHorizontalAlignment(javax.swing.SwingConstants.CENTER);
lblWaktu.setText("00:00:00.0");

btnStart.setText("Start");
btnStart.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        btnStartActionPerformed(evt);
    }
});

btnReset.setText("Reset");
btnReset.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        btnResetActionPerformed(evt);
    }
});

// layout menggunakan GroupLayout
javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
jPanel1.setLayout(jPanel1Layout);

jPanel1Layout.setHorizontalGroup(
    jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addComponent(lblWaktu, javax.swing.GroupLayout.DEFAULT_SIZE, 400, Short.MAX_VALUE)
);
```

```
.addGroup(jPanel1Layout.createSequentialGroup()
    .addGap(100, 100, 100)
    .addComponent(btnStart, javax.swing.GroupLayout.PREFERRED_SIZE, 80,
    javax.swing.GroupLayout.PREFERRED_SIZE)
    .addGap(50, 50, 50)
    .addComponent(btnReset, javax.swing.GroupLayout.PREFERRED_SIZE, 80,
    javax.swing.GroupLayout.PREFERRED_SIZE)
    .addContainerGap(90, Short.MAX_VALUE))
);

jPanel1Layout.setVerticalGroup(
    jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(jPanel1Layout.createSequentialGroup()
        .addGap(50, 50, 50)
        .addComponent(lblWaktu, javax.swing.GroupLayout.PREFERRED_SIZE, 100,
        javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGap(50, 50, 50)
        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
            .addComponent(btnStart)
            .addComponent(btnReset))
        .addContainerGap(50, Short.MAX_VALUE))
);

javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
getContentPane().setLayout(layout);
layout.setHorizontalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
    javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
);
layout.setVerticalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
```

```
.addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)

);

pack();
setLocationRelativeTo(null);
}

/***
* Event handler untuk tombol Start/Pause
*/
private void btnStartActionPerformed(java.awt.event.ActionEvent evt) {

if (btnStart.getText().equals(Start)) {

btnStart.setText(Pause);
btnReset.setEnabled(false);
start();
} else {

btnStart.setText(Start);
btnReset.setEnabled(true);
pause();
}
}

/***
* Event handler untuk tombol Reset
*/
private void btnResetActionPerformed(java.awt.event.ActionEvent evt) {

reset();
}

/***
```

```

* Main method untuk menjalankan aplikasi

*/

public static void main(String args[]) {

    java.awt.EventQueue.invokeLater(new Runnable() {

        public void run() {

            new StopWatchDemo().setVisible(true);

        }

    });

}

// Deklarasi komponen

private javax.swing.JPanel jPanel1;

private javax.swing.JLabel lblWaktu;

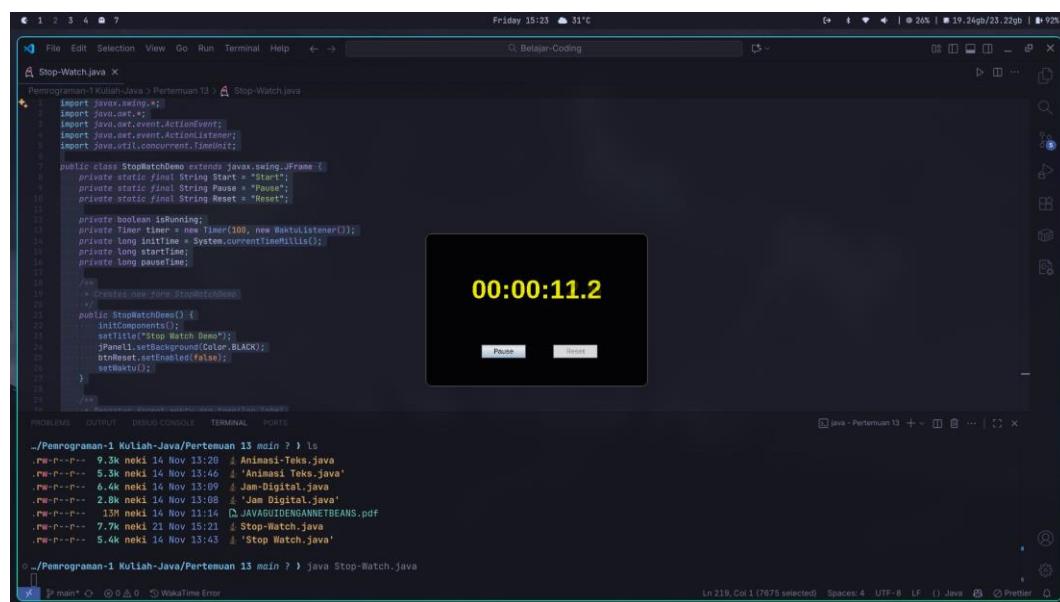
private javax.swing.JButton btnReset;

private javax.swing.JButton btnStart;

}

```

## Output :



Penjelasan:

- Tujuan Program: Membuat aplikasi Stopwatch yang memiliki fungsi Start (Mulai), Pause (Jeda), dan Reset.
- Logika Perhitungan Waktu (Time Delta): Berbeda dengan program counter sebelumnya yang hanya menambah angka (+1), kode ini menghitung selisih waktu nyata.
  - Rumusnya: Waktu Sekarang - Waktu Mulai.
  - Ini membuat perhitungan waktu tetap akurat sesuai jam sistem komputer.
- Logika Tombol Toggle (Start/Pause): Tombol btnStart memiliki fungsi ganda:
  - Jika tulisan "Start": Timer berjalan, tombol berubah jadi "Pause", tombol Reset dimatikan (disable).
  - Jika tulisan "Pause": Timer berhenti, tombol berubah jadi "Start", tombol Reset diaktifkan (enable).
- Mekanisme Pause yang Cerdas:
  - Saat tombol "Start" ditekan kembali setelah Pause, program tidak memulai dari nol.
  - Program menggunakan rumus startTime = System.currentTimeMillis() - (pauseTime - startTime) untuk memastikan waktu berlanjut mulus dari angka terakhir, seolah-olah waktu "berhenti" saat dipause.
- Format Tampilan (TimeUnit):
  - Menggunakan TimeUnit untuk mengonversi ribuan milidetik menjadi format Jam, Menit, Detik, dan Milidetik.
  - Hasilnya diformat string menjadi 00:00:00.0.
- Timer UI: Objek Timer diset dengan interval 100ms (0.1 detik) hanya untuk memperbarui tampilan label agar terlihat berjalan mulus, bukan untuk menghitung logika waktunya.

Code:

```

1 import java.awt.*;
2 import java.awt.event.*;
3 import javax.swing.*;
4 import javax.swing.event.ActionEvent;
5 import javax.swing.event.ActionListener;
6
7 public class TypingDemo extends javax.swing.JFrame {
8     private static final long serialVersionUID = 1L;
9
10    /**
11     * @param args the command line arguments
12     */
13    public static void main(String[] args) {
14        java.awt.EventQueue.invokeLater(new Runnable() {
15            public void run() {
16                new TypingDemo();
17            }
18        });
19    }
20
21    /**
22     * This method is called from within the constructor to initialize the form.
23     * @param evt
24     */
25    private void initComponents() {
26        try {
27            UIManager.setLookAndFeel(UIManager.getSystemLookAndFeelClassName());
28        } catch (Exception ex) {
29            ex.printStackTrace();
30        }
31
32        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
33        setUndecorated(true);
34
35        txapuisi = new JTextField("Ketik disini", 20);
36        txapuisi.setEditable(true);
37        txapuisi.setFont(new Font("Times New Roman", Font.PLAIN, 12));
38        txapuisi.setLineStyle(Frame.WINDOW_FRAME);
39
40        btmStart = new JButton("Start");
41        btmStart.addActionListener(new java.awt.event.ActionListener() {
42            public void actionPerformed(java.awt.event.ActionEvent evt) {
43                timer.start();
44            }
45        });
46
47        btmPause = new JButton("Pause");
48        btmPause.addActionListener(new java.awt.event.ActionListener() {
49            public void actionPerformed(java.awt.event.ActionEvent evt) {
50                timer.stop();
51            }
52        });
53
54        btmKeluar = new JButton("Keluar");
55        btmKeluar.addActionListener(new java.awt.event.ActionListener() {
56            public void actionPerformed(java.awt.event.ActionEvent evt) {
57                System.exit(0);
58            }
59        });
60
61        JPanel panel1 = new JPanel();
62        panel1.setLayout(new GridLayout(1, 1));
63        panel1.add(txapuisi);
64
65        JPanel panel2 = new JPanel();
66        panel2.setLayout(new GridLayout(1, 1));
67        panel2.add(btmStart);
68
69        JPanel panel3 = new JPanel();
70        panel3.setLayout(new GridLayout(1, 1));
71        panel3.add(btmPause);
72
73        JPanel panel4 = new JPanel();
74        panel4.setLayout(new GridLayout(1, 1));
75        panel4.add(btmKeluar);
76
77        JPanel panel5 = new JPanel();
78        panel5.setLayout(new GridLayout(1, 1));
79        panel5.add(panel1);
80
81        JPanel panel6 = new JPanel();
82        panel6.setLayout(new GridLayout(1, 1));
83        panel6.add(panel2);
84
84        JPanel panel7 = new JPanel();
85        panel7.setLayout(new GridLayout(1, 1));
86        panel7.add(panel3);
87
87        JPanel panel8 = new JPanel();
88        panel8.setLayout(new GridLayout(1, 1));
89        panel8.add(panel4);
90
91        JPanel panel9 = new JPanel();
92        panel9.setLayout(new GridLayout(1, 1));
93        panel9.add(panel5);
94
95        JPanel panel10 = new JPanel();
96        panel10.setLayout(new GridLayout(1, 1));
97        panel10.add(panel6);
98
99        JPanel panel11 = new JPanel();
100        panel11.setLayout(new GridLayout(1, 1));
101        panel11.add(panel7);
102
103        JPanel panel12 = new JPanel();
104        panel12.setLayout(new GridLayout(1, 1));
105        panel12.add(panel8);
106
107        JPanel panel13 = new JPanel();
108        panel13.setLayout(new GridLayout(1, 1));
109        panel13.add(panel9);
110
111        JPanel panel14 = new JPanel();
112        panel14.setLayout(new GridLayout(1, 1));
113        panel14.add(panel10);
114
115        JPanel panel15 = new JPanel();
116        panel15.setLayout(new GridLayout(1, 1));
117        panel15.add(panel11);
118
119        JPanel panel16 = new JPanel();
120        panel16.setLayout(new GridLayout(1, 1));
121        panel16.add(panel12);
122
123        JPanel panel17 = new JPanel();
124        panel17.setLayout(new GridLayout(1, 1));
125        panel17.add(panel13);
126
127        JPanel panel18 = new JPanel();
128        panel18.setLayout(new GridLayout(1, 1));
129        panel18.add(panel14);
130
131        JPanel panel19 = new JPanel();
132        panel19.setLayout(new GridLayout(1, 1));
133        panel19.add(panel15);
134
135        JPanel panel20 = new JPanel();
136        panel20.setLayout(new GridLayout(1, 1));
137        panel20.add(panel16);
138
139        JPanel panel21 = new JPanel();
140        panel21.setLayout(new GridLayout(1, 1));
141        panel21.add(panel17);
142
143        JPanel panel22 = new JPanel();
144        panel22.setLayout(new GridLayout(1, 1));
145        panel22.add(panel18);
146
147        JPanel panel23 = new JPanel();
148        panel23.setLayout(new GridLayout(1, 1));
149        panel23.add(panel19);
150
151        JPanel panel24 = new JPanel();
152        panel24.setLayout(new GridLayout(1, 1));
153        panel24.add(panel20);
154
155        JPanel panel25 = new JPanel();
156        panel25.setLayout(new GridLayout(1, 1));
157        panel25.add(panel21);
158
159        JPanel panel26 = new JPanel();
160        panel26.setLayout(new GridLayout(1, 1));
161        panel26.add(panel22);
162
163        JPanel panel27 = new JPanel();
164        panel27.setLayout(new GridLayout(1, 1));
165        panel27.add(panel23);
166
167        JPanel panel28 = new JPanel();
168        panel28.setLayout(new GridLayout(1, 1));
169        panel28.add(panel24);
170
171        JPanel panel29 = new JPanel();
172        panel29.setLayout(new GridLayout(1, 1));
173        panel29.add(panel25);
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175        JPanel panel30 = new JPanel();
176        panel30.setLayout(new GridLayout(1, 1));
177        panel30.add(panel26);
178
179        JPanel panel31 = new JPanel();
180        panel31.setLayout(new GridLayout(1, 1));
181        panel31.add(panel27);
182
183        JPanel panel32 = new JPanel();
184        panel32.setLayout(new GridLayout(1, 1));
185        panel32.add(panel28);
186
187        JPanel panel33 = new JPanel();
188        panel33.setLayout(new GridLayout(1, 1));
189        panel33.add(panel29);
190
191        JPanel panel34 = new JPanel();
192        panel34.setLayout(new GridLayout(1, 1));
193        panel34.add(panel30);
194
195        JPanel panel35 = new JPanel();
196        panel35.setLayout(new GridLayout(1, 1));
197        panel35.add(panel31);
198
199        JPanel panel36 = new JPanel();
200        panel36.setLayout(new GridLayout(1, 1));
201        panel36.add(panel32);
202
203        JPanel panel37 = new JPanel();
204        panel37.setLayout(new GridLayout(1, 1));
205        panel37.add(panel33);
206
207        JPanel panel38 = new JPanel();
208        panel38.setLayout(new GridLayout(1, 1));
209        panel38.add(panel34);
210
211        JPanel panel39 = new JPanel();
212        panel39.setLayout(new GridLayout(1, 1));
213        panel39.add(panel35);
214
215        JPanel panel40 = new JPanel();
216        panel40.setLayout(new GridLayout(1, 1));
217        panel40.add(panel36);
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219        JPanel panel41 = new JPanel();
220        panel41.setLayout(new GridLayout(1, 1));
221        panel41.add(panel37);
222
223        JPanel panel42 = new JPanel();
224        panel42.setLayout(new GridLayout(1, 1));
225        panel42.add(panel38);
226
227        JPanel panel43 = new JPanel();
228        panel43.setLayout(new GridLayout(1, 1));
229        panel43.add(panel39);
230
231        JPanel panel44 = new JPanel();
232        panel44.setLayout(new GridLayout(1, 1));
233        panel44.add(panel40);
234
235        JPanel panel45 = new JPanel();
236        panel45.setLayout(new GridLayout(1, 1));
237        panel45.add(panel41);
238
239        JPanel panel46 = new JPanel();
240        panel46.setLayout(new GridLayout(1, 1));
241        panel46.add(panel42);
242
243        JPanel panel47 = new JPanel();
244        panel47.setLayout(new GridLayout(1, 1));
245        panel47.add(panel43);
246
247        JPanel panel48 = new JPanel();
248        panel48.setLayout(new GridLayout(1, 1));
249        panel48.add(panel44);
250
251        JPanel panel49 = new JPanel();
252        panel49.setLayout(new GridLayout(1, 1));
253        panel49.add(panel45);
254
255        JPanel panel50 = new JPanel();
256        panel50.setLayout(new GridLayout(1, 1));
257        panel50.add(panel46);
258
259        JPanel panel51 = new JPanel();
260        panel51.setLayout(new GridLayout(1, 1));
261        panel51.add(panel47);
262
263        JPanel panel52 = new JPanel();
264        panel52.setLayout(new GridLayout(1, 1));
265        panel52.add(panel48);
266
267        JPanel panel53 = new JPanel();
268        panel53.setLayout(new GridLayout(1, 1));
269        panel53.add(panel49);
270
271        JPanel panel54 = new JPanel();
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273        panel54.add(panel50);
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275        JPanel panel55 = new JPanel();
276        panel55.setLayout(new GridLayout(1, 1));
277        panel55.add(panel51);
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279        JPanel panel56 = new JPanel();
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281        panel56.add(panel52);
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283        JPanel panel57 = new JPanel();
284        panel57.setLayout(new GridLayout(1, 1));
285        panel57.add(panel53);
286
287        JPanel panel58 = new JPanel();
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289        panel58.add(panel54);
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291        JPanel panel59 = new JPanel();
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297        panel60.add(panel56);
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303        JPanel panel62 = new JPanel();
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305        panel62.add(panel58);
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307        JPanel panel63 = new JPanel();
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315        JPanel panel65 = new JPanel();
316        panel65.setLayout(new GridLayout(1, 1));
317        panel65.add(panel61);
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319        JPanel panel66 = new JPanel();
320        panel66.setLayout(new GridLayout(1, 1));
321        panel66.add(panel62);
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325        panel67.add(panel63);
326
327        JPanel panel68 = new JPanel();
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329        panel68.add(panel64);
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331        JPanel panel69 = new JPanel();
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334
335        JPanel panel70 = new JPanel();
336        panel70.setLayout(new GridLayout(1, 1));
337        panel70.add(panel66);
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345        panel72.add(panel68);
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348        panel73.setLayout(new GridLayout(1, 1));
349        panel73.add(panel69);
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351        JPanel panel74 = new JPanel();
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357        panel75.add(panel71);
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361        panel76.add(panel72);
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373        panel79.add(panel75);
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381        panel81.add(panel77);
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384        panel82.setLayout(new GridLayout(1, 1));
385        panel82.add(panel78);
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391        JPanel panel84 = new JPanel();
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393        panel84.add(panel80);
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395        JPanel panel85 = new JPanel();
396        panel85.setLayout(new GridLayout(1, 1));
397        panel85.add(panel81);
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404        panel87.setLayout(new GridLayout(1, 1));
405        panel87.add(panel83);
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409        panel88.add(panel84);
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413        panel89.add(panel85);
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417        panel90.add(panel86);
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441        panel96.add(panel92);
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444        panel97.setLayout(new GridLayout(1, 1));
445        panel97.add(panel93);
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449        panel98.add(panel94);
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452        panel99.setLayout(new GridLayout(1, 1));
453        panel99.add(panel95);
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456        panel100.setLayout(new GridLayout(1, 1));
457        panel100.add(panel96);
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461        panel101.add(panel97);
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463        JPanel panel102 = new JPanel();
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465        panel102.add(panel98);
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469        panel103.add(panel99);
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481        panel106.add(panel102);
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485        panel107.add(panel103);
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493        panel109.add(panel105);
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497        panel110.add(panel106);
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505        panel112.add(panel108);
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508        panel113.setLayout(new GridLayout(1, 1));
509        panel113.add(panel109);
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512        panel114.setLayout(new GridLayout(1, 1));
513        panel114.add(panel110);
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516        panel115.setLayout(new GridLayout(1, 1));
517        panel115.add(panel111);
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521        panel116.add(panel112);
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525        panel117.add(panel113);
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531        JPanel panel119 = new JPanel();
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553        panel124.add(panel120);
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555        JPanel panel125 = new JPanel();
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559        JPanel panel126 = new JPanel();
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563        JPanel panel127 = new JPanel();
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869        panel203.add(panel200);
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871        JPanel panel204 = new JPanel();
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873        panel204.add(panel201);
874
875        JPanel panel205 = new JPanel();
876        panel205.setLayout(new GridLayout(1, 1));
877        panel205.add(panel202);
878
879        JPanel panel206 = new JPanel();
880        panel206.setLayout(new GridLayout(1, 1));
881        panel206.add(panel203);
882
883        JPanel panel207 = new JPanel();
884        panel207.setLayout(new GridLayout(1, 1));
885        panel207.add(panel204);
886
887        JPanel panel208 = new JPanel();
888        panel208.setLayout(new GridLayout(1, 1));
889        panel208.add(panel205);
890
891        JPanel panel209 = new JPanel();
892        panel209.setLayout(new GridLayout(1, 1));
893        panel209.add(panel206);
894
895        JPanel panel210 = new JPanel();
896        panel210.setLayout(new GridLayout(1, 1));
897        panel210.add(panel207);
898
899        JPanel panel211 = new JPanel();
900        panel211.setLayout(new GridLayout(1, 1));
901        panel211.add(panel208);
902
903        JPanel panel212 = new JPanel();
904        panel212.setLayout(new GridLayout(1, 1));
905        panel212.add(panel209);
906
907        JPanel panel213 = new JPanel();
908        panel213.setLayout(new GridLayout(1, 1));
909        panel213.add(panel210);
910
911        JPanel panel214 = new JPanel();
912        panel214.setLayout(new GridLayout(1, 1));
913        panel213.add(panel211);
914
915        JPanel panel216 = new JPanel();
916        panel216.setLayout(new GridLayout(1, 1));
917        panel216.add(panel212);
918
919        JPanel panel217 = new JPanel();
920        panel217.setLayout(new GridLayout(1, 1));
921        panel217.add(panel213);
922
923        JPanel panel218 = new JPanel();
924        panel218.setLayout(new GridLayout(1, 1));
925        panel218.add(panel214);
926
927        JPanel panel219 = new JPanel();
928        panel219.setLayout(new GridLayout(1, 1));
929        panel219.add(panel216);
930
931        JPanel panel220 = new JPanel();
932        panel220.setLayout(new GridLayout(1, 1));
933        panel220.add(panel217);
934
935        JPanel panel221 = new JPanel();
936        panel221.setLayout(new GridLayout(1, 1));
937        panel221.add(panel218);
938
939        JPanel panel222 = new JPanel();
940        panel222.setLayout(new GridLayout(1, 1));
941        panel222.add(panel219);
942
943        JPanel panel223 = new JPanel();
944        panel223.setLayout(new GridLayout(1, 1));
945        panel223.add(panel220);
946
947        JPanel panel224 = new JPanel();
948        panel224.setLayout(new GridLayout(1, 1));
949        panel224.add(panel221);
950
951        JPanel panel225 = new JPanel();
952        panel225.setLayout(new GridLayout(1, 1));
953        panel225.add(panel222);
954
955        JPanel panel226 = new JPanel();
956        panel226.setLayout(new GridLayout(1, 1));
957        panel226.add(panel223);
958
959        JPanel panel227 = new JPanel();
960        panel227.setLayout(new GridLayout(1, 1));
961        panel227.add(panel224);
962
963        JPanel panel228 = new JPanel();
964        panel228.setLayout(new GridLayout(1, 1));
965        panel228.add(panel225);
966
967        JPanel panel229 = new JPanel();
968        panel229.setLayout(new GridLayout(1, 1));
969        panel229.add(panel226);
970
971        JPanel panel230 = new JPanel();
972        panel230.setLayout(new GridLayout(1, 1));
973        panel230.add(panel227);
974
975        JPanel panel231 = new JPanel();
976        panel231.setLayout(new GridLayout(1, 1));
977        panel231.add(panel228);
978
979        JPanel panel232 = new JPanel();
980        panel232.setLayout(new GridLayout(1, 1));
981        panel2
```

Output:

```

1 import javax.swing.*;
2 import java.awt.*;
3 import java.awt.event.ActionEvent;
4 import java.awt.event.ActionListener;
5
6 public class TypingDemo extends javax.swing.JFrame {
7     private String puisi = "Karawang-Bekasi\\n\\n" +
8         "Kami yang kini terbaring antara Krauau" +
9         "tidak bisa terik \"Merdeka\" dan angin" +
10        "+\\n" +
11        "Tapi siapakah yang tidak lagi mendengar" +
12        "terbayang kami maju dan mendegar hati" +
13        "Kami bicara padamu dalam hening di malam" +
14        "+\\n" +
15        "Jika ada rasa hampa dan jauh dinding" +
16        "Kami senti audo. Yang tinggal tulang di" +
17        "Kenang, kenanglah kami.\\n" +
18        "Kami sudah coba apa yang kami bisa\\n" +
19        "Tapi kerja belum selesai, belum bisa" +
20        "arti 4-5 ribu nyawa\\n" +
21        "Kami cuma tulang-tulang berserakan\\n" +
22        "Tapi adalah kepunyaann\\n" +
23        "Kaulah lagi yang tentukan nilai tulan" +
24        "Atau jika kami relayan untuk kemerdekaan" +
25        "+\\n" +
26        "Kami sekarang ini kembali lagi bisa" +
27        "Kami sekragan sekragan berkerak\\n" +
28        "Kami bicara padamu dalam malam sepi\\n" +
29        "Jika ada rasa hampa dan jauh dinding yang berdetak\\n\\n" +
30        "Kenang, kenanglah kami\\n" +
31        "Teruskan, teruskan jika kami\\n" +
32        "Menjaga Bung Karno\\n" +
33        "menjaga Bung Hatta\\n" +
34        "menjaga Bung Sjahri\\n\\n" +
35        "Kami sekarang mayat\\n" +
36        "Berikan kami arti\\n" +
37        "Berjajalah terus di garis batas pernyataan dan impian\\n\\n" +
38
39 }

```

Krauau kali  
Kami yang kini terbaring antara Krauau  
Ituk bisa terik "Merdeka" dan angin semala lagi  
Tapi siapakah yang tidak lagi mendengar diri kami,  
terbayang kami maju dan mendegar hati?  
Kami bicara padamu dalam hening di malam segi  
Jika ada rasa hampa dan jauh dinding yang berdetak  
Kenang, kenanglah kami  
Kami sudah coba apa yang kami bisa  
Tadi kita belum selesai, belum bisa memperhitungkan arti 4-5 ribu nyawa  
Jika punya tulang tulang berserakan  
Kau yang tentukan nilai tulang tulang berserakan  
Hau jea kami miring untuk kemerdekaan kemerdekaan dan harapan  
Kami tidak tahu, kami tidak lagi bisa berbuat  
Kau senangnya yang berkuila  
Kami bicara padamu dalam hening di malam segi

Penjelasan:

- **Tujuan Program:** Membuat efek "mesin ketik" (typing animation) di mana teks puisi muncul karakter demi karakter secara otomatis.
- **Data Teks:** Sebuah variabel String puisi menampung seluruh teks puisi "Karawang-Bekasi" karya Chairil Anwar yang akan ditampilkan.
- **Variabel Index:** int charIndex digunakan sebagai penanda posisi karakter yang sedang ditampilkan saat ini (dimulai dari 0).
- **Mekanisme Timer:**
  - Objek Timer diset dengan interval **100 ms**.
  - Setiap detak timer, program mengambil satu karakter dari string puisi berdasarkan charIndex.
  - Karakter tersebut ditambahkan ke JTextArea (txaPuisi.setText(...)).
  - charIndex ditambah 1 (charIndex++) untuk persiapan karakter selanjutnya.
- **Kondisi Berhenti:** Jika charIndex sudah mencapai panjang total string puisi (puisi.length()), timer dimatikan (timer.stop()) dan tombol Start diaktifkan kembali.
- **Logika Tombol:**
  - **Start:** Memulai timer. Jika puisi sudah selesai, teks direset kosong dan indeks dikembalikan ke 0 untuk mulai ulang.
  - **Pause/Continue:** Tombol ini berfungsi sebagai *toggle*.
    - Jika diklik saat berjalan ("Pause"), timer dihentikan (stop).
    - Jika diklik saat berhenti ("Continue"), timer dilanjutkan (start).