LAMPIRAN

1. Tabel ASCII

Binary	Oct	Dec	Hex	Glyph
010 0000	040	32	20	sp
010 0001	041	33	21	!
010 0010	042	34	22	"
010 0011	043	35	23	#
010 0100	044	36	24	$
010 0101	045	37	25	%
010 0110	046	38	26	&
010 0111	047	39	27	'
010 1000	050	40	28	(
010 1001	051	41	29	)
010 1010	052	42	2A	*
010 1011	053	43	2B	+
010 1100	054	44	2C	,
010 1101	055	45	2D	-
010 1110	056	46	2E	.
010 1111	057	47	2F	/
011 0000	060	48	30	0
011 0001	061	49	31	1
011 0010	062	50	32	2
011 0011	063	51	33	3
011 0100	064	52	34	4
011 0101	065	53	35	5
011 0110	066	54	36	6
011 0111	067	55	37	7
011 1000	070	56	38	8
011 1001	071	57	39	9
011 1010	072	58	3A	:
011 1011	073	59	3B	;
011 1100	074	60	3C	<
011 1101	075	61	3D	=
011 1110	076	62	3E	>
011 1111	077	63	3F	?

Binary	Oct	Dec	Hex	Glyph
100 0000	100	64	40	@
100 0001	101	65	41	A
100 0010	102	66	42	B
100 0011	103	67	43	C
100 0100	104	68	44	D
100 0101	105	69	45	E
100 0110	106	70	46	F
100 0111	107	71	47	G
100 1000	110	72	48	H
100 1001	111	73	49	I
100 1010	112	74	4A	J
100 1011	113	75	4B	K
100 1100	114	76	4C	L
100 1101	115	77	4D	M
100 1110	116	78	4E	N
100 1111	117	79	4F	O
101 0000	120	80	50	P
101 0001	121	81	51	Q
101 0010	122	82	52	R
101 0011	123	83	53	S
101 0100	124	84	54	T
101 0101	125	85	55	U
101 0110	126	86	56	V
101 0111	127	87	57	W
101 1000	130	88	58	X
101 1001	131	89	59	Y
101 1010	132	90	5A	Z
101 1011	133	91	5B	[
101 1100	134	92	5C	\
101 1101	135	93	5D	]
101 1110	136	94	5E	^
101 1111	137	95	5F	_

Binary	Oct	Dec	Hex	Glyph
110 0000	140	96	60	`
110 0001	141	97	61	a
110 0010	142	98	62	b
110 0011	143	99	63	c
110 0100	144	100	64	d
110 0101	145	101	65	e
110 0110	146	102	66	f
110 0111	147	103	67	g
110 1000	150	104	68	h
110 1001	151	105	69	i
110 1010	152	106	6A	j
110 1011	153	107	6B	k
110 1100	154	108	6C	l
110 1101	155	109	6D	m
110 1110	156	110	6E	n
110 1111	157	111	6F	o
111 0000	160	112	70	p
111 0001	161	113	71	q
111 0010	162	114	72	r
111 0011	163	115	73	s
111 0100	164	116	74	t
111 0101	165	117	75	u
111 0110	166	118	76	v
111 0111	167	119	77	w
111 1000	170	120	78	x
111 1001	171	121	79	y
111 1010	172	122	7A	z
111 1011	173	123	7B	{
111 1100	174	124	7C	|
111 1101	175	125	7D	}
111 1110	176	126	7E	~

2. Tabel S-Box

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	63	7C	77	7B	F2	6B	6F	C5	30	01	67	2B	FE	D7	AB	76
1	CA	82	C9	7D	FA	59	47	F0	AD	D4	A2	AF	9C	A4	72	C0
2	B7	FD	93	26	36	3F	F7	CC	34	A5	E5	F1	71	D8	31	15
3	04	C7	23	C3	18	96	05	9A	07	12	80	E2	EB	27	B2	75
4	09	83	2C	1A	1B	6E	5A	A0	52	3B	D6	B3	29	E3	2F	84
5	53	D1	00	ED	20	FC	B1	5B	6A	CB	BE	39	4A	4C	58	CF
6	D0	EF	AA	FB	43	4D	33	85	45	F9	02	7F	50	3C	9F	A8
7	51	A3	40	8F	92	9D	38	F5	BC	B6	DA	21	10	FF	F3	D2
8	CD	0C	13	EC	5F	97	44	17	C4	A7	7E	3D	64	5D	19	73
9	60	81	4F	DC	22	2A	90	88	46	EE	B8	14	DE	5E	0B	DB
A	E0	32	3A	0A	49	06	24	5C	C2	D3	AC	62	91	95	E4	79
B	E7	C8	37	6D	8D	D5	4E	A9	6C	56	F4	EA	65	7A	AE	08
C	BA	78	25	2E	1C	A6	B4	C6	E8	DD	74	1F	4B	BD	8B	8A
D	70	3E	B5	66	48	03	F6	0E	61	35	57	B9	86	C1	1D	9E
E	E1	F8	98	11	69	D9	8E	94	9B	1E	87	E9	CE	55	28	DF
F	8C	A1	89	0D	BF	E6	42	68	41	99	2D	0F	B0	54	BB	16

3. Tabel R-Con

Rcon Constants (Base 16)			
Round	Constant(Rcon)	Round	Constant(Rcon)
1	01 00 00 00	6	20 00 00 00
2	02 00 00 00	7	40 00 00 00
3	04 00 00 00	8	80 00 00 00
4	08 00 00 00	9	1B 00 00 00
5	10 00 00 00	10	36 00 00 00

4. Kodingan Histogram RGB Using Matlab

```
clc
clear all
close all
a=imread('D:\SKRIPSI DATA\Data Test\New folder\Data ZIP\Use Foto\Gambar
Replace 5.jpg');
subplot(1,4,1);
imshow(a);
title('Original Colored Image');
rc=a(:,:,1);
subplot(1,4,2);
imhist(rc);
title('Histogram of the red channel');
gc=a(:,:,2);
subplot(1,4,3);
imhist(gc);
title('Histogram of the green channel');
hc=a(:,:,3);
subplot(1,4,4);
imhist(hc);
title('Histogram of the blue channel');
```

5. Kodingan Login

A. Login.java

```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package login;

import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import javax.swing.JOptionPane;
import stega.Main;

/**
 *
 * @author PY7
 */
public class Login extends javax.swing.JFrame {

    /**
     * Creates new form Login
     */
    public Login() {
        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() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        txUsername = new javax.swing.JTextField();
        jLabel3 = new javax.swing.JLabel();
        txPassword = new javax.swing.JPasswordField();
        btnLogin = new javax.swing.JButton();
        btnRegister = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        jPanel1.setBackground(new java.awt.Color(153, 153, 255));

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 18)); // NOI18N
        jLabel1.setText("USER LOGIN");

        javax.swing.GroupLayout jPanel1Layout = new
javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(144, 144, 144)
                .addComponent(jLabel1)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
```

```
        );
        jPanel1Layout.setVerticalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(20, 20, 20)
                .addComponent(jLabel1)
                .addContainerGap(21, Short.MAX_VALUE))
        );

        jLabel2.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel2.setText("Username:");

        jLabel3.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel3.setText("Password:");

        btnLogin.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/icon/icon (119).png"))); //
NOI18N
        btnLogin.setText("Login");
        btnLogin.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                btnLoginActionPerformed(evt);
            }
        });

        btnRegister.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/icon/icon (163).png"))); //
NOI18N
        btnRegister.setText("Register");
        btnRegister.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                btnRegisterActionPerformed(evt);
            }
        });

        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)
            .addGroup(layout.createSequentialGroup()
                .addGap(46, 46, 46)

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

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jLabel2)
                            .addComponent(jLabel3))
                        .addGap(27, 27, 27)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)
                            .addComponent(txUsername)
                            .addComponent(txPassword,
javax.swing.GroupLayout.PREFERRED_SIZE, 201,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(btnLogin,
javax.swing.GroupLayout.PREFERRED_SIZE, 130,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addGap(18, 18, 18)
```

```
                        .addComponent(btnRegister,
javax.swing.GroupLayout.PREFERRED_SIZE, 130,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                .addContainerGap(61, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(47, 47, 47)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jLabel2)
                    .addComponent(txUsername,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jLabel3)
                    .addComponent(txPassword,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(35, 35, 35)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)
                    .addComponent(btnLogin,
javax.swing.GroupLayout.DEFAULT_SIZE, 42, Short.MAX_VALUE)
                    .addComponent(btnRegister,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
                .addGap(0, 32, Short.MAX_VALUE))
        );

        setSize(new java.awt.Dimension(416, 328));
        setLocationRelativeTo(null);
    }// </editor-fold>

    private void btnLoginActionPerformed(java.awt.event.ActionEvent evt) {
        // TODO add your handling code here:
        try{
            Connection c = Koneksi.getKoneksi();
            Statement s = c.createStatement();

            String sql = "SELECT * FROM login WHERE Username='" +
txUsername.getText()
                    +"' and Password='"+ txPassword.getText() + "'";
            ResultSet r = s.executeQuery(sql);
            new Main().setVisible(true);
            dispose();
            if (r.next()){
                JOptionPane.showMessageDialog(null, "Login Successfully");
                this.dispose(); //close the form
            }else{
                JOptionPane.showMessageDialog(null, "Wrong Username or
Password");
                txPassword.requestFocus();
            }
        }catch(SQLException e){
            System.out.println("error");
        }
    }
```

```
    private void btnRegisterActionPerformed(java.awt.event.ActionEvent evt) {
        // TODO add your handling code here:
        this.dispose();
        Register a = new Register();
        a.setVisible(true);
    }

    /**
     * @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(Login.class.getName()).log(java.util.logging
.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(Login.class.getName()).log(java.util.logging
.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(Login.class.getName()).log(java.util.logging
.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(Login.class.getName()).log(java.util.logging
.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new Login().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton btnLogin;
    private javax.swing.JButton btnRegister;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JPasswordField txPassword;
    private javax.swing.JTextField txUsername;
    // End of variables declaration
}
```

B. Register.java

```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package login;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import javax.swing.JOptionPane;

/**
 *
 * @author PY7
 */
public class Register extends javax.swing.JFrame {

    /**
     * Creates new form Register
     */
    public Register() {
        initComponents();
        txID.setEnabled(false);
        autonumber();
    }

    private void autonumber(){
        try{
            Connection c = Koneksi.getKoneksi();
            Statement s = c.createStatement();
            String sql = "SELECT * FROM login ORDER BY id DESC";
            ResultSet r = s.executeQuery(sql);
            if (r.next()) {
                String NoID = r.getString("id").substring(2);
                String ID = "" +(Integer.parseInt(NoID)+1);
                String Zero = "";

                if (ID.length()==1)
                {Zero = "00";}
                else if(ID.length()==2)
                {Zero = "0";}
                else if(ID.length()==3)
                {Zero = "";}

                txID.setText("AD" + Zero + ID);
            }else{
                txID.setText("AD001");
            }
            r.close();
            s.close();
        }catch(Exception e){
            System.out.println("autonumber error");
        }
    }

    /**
     * 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() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jLabel4 = new javax.swing.JLabel();
        jLabel5 = new javax.swing.JLabel();
        txID = new javax.swing.JTextField();
        txUsername = new javax.swing.JTextField();
        txPassword = new javax.swing.JPasswordField();
        txConPassword = new javax.swing.JPasswordField();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        jPanel1.setBackground(new java.awt.Color(153, 153, 255));

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 18)); // NOI18N
        jLabel1.setText("REGISTER");

        javax.swing.GroupLayout jPanel1Layout = new
javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(152, 152, 152)
                .addComponent(jLabel1)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        );
        jPanel1Layout.setVerticalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(20, 20, 20)
                .addComponent(jLabel1)
                .addContainerGap(21, Short.MAX_VALUE))
        );

        jLabel2.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel2.setText("ID");

        jLabel3.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel3.setText("Username");

        jLabel4.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel4.setText("Password");

        jLabel5.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel5.setText("Con.Password");

        jButton1.setText("Register");
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setText("Batal");
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
```

```
        });

        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)
            .addGroup(layout.createSequentialGroup()
                .addGap(35, 35, 35)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jLabel2)
                    .addComponent(jLabel3)
                    .addComponent(jLabel4)
                    .addComponent(jLabel5))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 45,
Short.MAX_VALUE)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)
                    .addComponent(txID)
                    .addComponent(txUsername)
                    .addComponent(txPassword)
                    .addComponent(txConPassword,
javax.swing.GroupLayout.PREFERRED_SIZE, 194,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(39, 39, 39))
            .addGroup(layout.createSequentialGroup()
                .addGap(115, 115, 115)
                .addComponent(jButton1)
                .addGap(18, 18, 18)
                .addComponent(jButton2, javax.swing.GroupLayout.PREFERRED_SIZE,
73, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(30, 30, 30)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jLabel2)
                    .addComponent(txID, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(13, 13, 13)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jLabel3)
                    .addComponent(txUsername,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(15, 15, 15)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jLabel4)
```

```
                    .addComponent(txPassword,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jLabel5)
                    .addComponent(txConPassword,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(27, 27, 27)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE
)
                    .addComponent(jButton1,
javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jButton2,
javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(0, 48, Short.MAX_VALUE))
        );

        setSize(new java.awt.Dimension(416, 372));
        setLocationRelativeTo(null);
    }// </editor-fold>

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
        // TODO add your handling code here:
        String id = txID.getText().toString().trim();
        String username = txUsername.getText().toString().trim();
        String password = txPassword.getText().toString().trim();
        String conPassword = txConPassword.getText().toString().trim();

        if (!password.equals(conPassword)){
            JOptionPane.showMessageDialog(null, "Password not match");
        }else if (password.equals("") || username.equals("")){
            JOptionPane.showMessageDialog(null, "Username or Password cannot be
empty");
        }else{
            try{
                Connection c = Koneksi.getKoneksi();
                String sql = "INSERT INTO Login VALUES (?, ?, ?)";
                PreparedStatement p = c.prepareStatement(sql);
                p.setString(1, id);
                p.setString(2, username);
                p.setString(3, password);
                p.executeUpdate();
                p.close();
                JOptionPane.showMessageDialog(null, "Create Account
Successfully");
            }catch(SQLException e){
                System.out.println("Error");
            }finally{
                this.dispose();
                Login a = new Login();
                a.setVisible(true);
            }
        }
    }

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {
        // TODO add your handling code here:
        this.dispose();
        Login a = new Login();
        a.setVisible(true);
    }
```

```
    /**
     * @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(Register.class.getName()).log(java.util.logg
ing.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(Register.class.getName()).log(java.util.logg
ing.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(Register.class.getName()).log(java.util.logg
ing.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(Register.class.getName()).log(java.util.logg
ing.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new Register().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JPasswordField txConPassword;
    private javax.swing.JTextField txID;
    private javax.swing.JPasswordField txPassword;
    private javax.swing.JTextField txUsername;
    // End of variables declaration
}
```

6. Kodingan Penguncian & Pembukaan

A. Compress.java

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package stega;

/**
 *
 * @author RizkySatriaWibowo
 */
import javafx.scene.Scene;

import java.io.*;
import java.util.ArrayList;
import java.util.HashMap;

public class Compress {
    static int count = 7;
    static int buffer = 0;
    static int length=0;
    ArrayList<Node> nodes  = new ArrayList<>();
    private File compressFile;
    private String outputFile;
    public Compress(String path) throws IOException {
        String out;
        compressFile = new File(path);
                 //This can only have one stream here.
        if(compressFile.isDirectory()){
            out=path+".encrypted";
        }else {
            String prefix = path.substring(0, path.lastIndexOf("."));//
            out= prefix+".encrypted";
        }
        BufferedOutputStream outputStream= new BufferedOutputStream(new
FileOutputStream(out));
        compressFile(compressFile,outputStream);
        outputStream.close();

        outputFile = out;
    }

    public String getFile() {
        return outputFile;
    }

    public void compressFile(File ptah,BufferedOutputStream
bufferedOutputStream) throws IOException {
        if(ptah.isDirectory()){
            String directoryName = ptah.getPath();
            bufferedOutputStream.write(directoryName.length());
            int type=1;
            bufferedOutputStream.write(type);
            for(int a=0;a<directoryName.length();a++){
                char ch = directoryName.charAt(a);
                bufferedOutputStream.write(ch);
                                // Write the length of the file name
and file name
            }
            compress_file(ptah,bufferedOutputStream);
        }else {
            int type=0;
            String directoryName = ptah.getPath();
```

```
           // System.out.println(directoryName+"  "+
directoryName.length());
            bufferedOutputStream.write(directoryName.length());
                        bufferedOutputStream.write(type);//type
            for(int a=0;a<directoryName.length();a++){
                char ch = directoryName.charAt(a);
                bufferedOutputStream.write(ch);
                // Write the length of the file name
            }
           // System.out.println(directoryName.length() + "   type   "+
type +"   "+ directoryName );
            compress_f(ptah,bufferedOutputStream);
        }
    }

    private void compress_file(File ptah, BufferedOutputStream
bufferedOutputStream) throws IOException {
        if (!ptah.exists())
            return;
        File[] files = ptah.listFiles();
         for (int i = 0; i < files.length; i++) {
       compressFile(files[i],bufferedOutputStream);
        }
    }
    private void compress_f(File file, BufferedOutputStream
bufferedOutputStream) throws IOException {
        if(!file.exists())
            return;
        int[] characterAndWeight =getInts(file);
        for(int i= 0;i<256;i++){
            if(characterAndWeight[i]!=0){
                nodes.add(new Node(characterAndWeight[i],i));
            }
                 }//Get the weight and node of the Huffman tree
        HashMap<Integer,String> map= new HashMap<>();
        huffmanTree huffmanTree =new huffmanTree(nodes);
        huffmanTree.print(huffmanTree.root,"",  map);//create the
hashMap
        writeFile(file,bufferedOutputStream,map);//compress the file
        nodes.clear();
        map.clear();
    }

    public static void writeFile(File path, BufferedOutputStream
bufferedOutputStream, HashMap<Integer,String> map) throws IOException {
        BufferedInputStream fis = new BufferedInputStream(new
FileInputStream(path));
        BufferedOutputStream out = bufferedOutputStream;
        String theCodeOfLength="";
        for(int i=0x80000000;i!=0;i>>>=1){
            theCodeOfLength+=(length&i)==0?'0':'1';
                 }//convert to 32-bit binary
        for (int j = 0; j<32 ; j++){
            char ch = theCodeOfLength.charAt(j);
            writeBit(ch-'0',out);
        }
                 //System.out.println(length+" 32-bit encoding "+ yy);
        length=0;
//write the length of byte into the compressed file
        for(int i =0;i<=255;i++){
            if(map.containsKey(i)){
                String character= map.get(i);
                int a = character.length();
                 out.write((byte)a);
            }else {
                out.write((byte)0);
            }
        }
```

```
                // Write Huffman code length
        for(int i= 0;i<=255;i++){
            if(map.containsKey(i)){
                String character = map.get(i);
                for (int j = 0; j< character.length(); j++) {
                    char ch = character.charAt(j);
                    writeBit(ch-'0',out);
                }
            }
                 }//Write Huffman coding

        //System.out.println(buffer+" the last  code    "+count);
        int  value= fis.read();
        while(value!=-1){
            String str= map.get(value);
            for (int i = 0; i < str.length(); i++) {
                char ch = str.charAt(i);
                writeBit(ch-'0',out);
            }
            value = fis.read();
        }
        System.out.println(buffer);
        if(buffer!=0)
            out.write(buffer);//write to the end of the file
        buffer=0;
        count=7;
        fis.close();
    }


    private static void writeBit(int ch,BufferedOutputStream
outputStream) throws IOException {
        int a= ch<<count;
        buffer=buffer|a;
        count--;
        if (count==-1){
            outputStream.write(buffer);
            count=7;
            buffer=0;
        }
    }



    public  static int[] getInts(File path) throws IOException {
        int [] times = new int[256];
        BufferedInputStream fis = new BufferedInputStream(new
FileInputStream(path));
        int value = fis.read();
        while (value!=-1){
            length++;
            times[value]++;
            value=fis.read();
        }
        fis.close();
        return times;
    }
//    public static void main(String[] args) throws IOException {
//        long start = System.currentTimeMillis();
//               Compress compress = new
compress("file/3.csv");//Change your own file path here.
//        long end = System.currentTimeMillis();
//        System.out.println("execute time:"+(end - start)+"ms");
//
//    }

}
```

B. Decompress.java

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package stega;

/**
 *
 * @author RizkySatriaWibowo
 */

import java.io.*;
import java.util.ArrayList;
import java.util.HashMap;
public class Decompress {//it should be decompress ,but i used decode .
    static  HashMap<String,Integer> hashMap= new HashMap<>();//the
hashMap is used store the characters and  its huffmanCode
    static int readCount=7;
    static String fileName = "";
    static   ArrayList<Integer> code= new ArrayList<>();
    public  Decompress(String path) throws IOException {
        BufferedInputStream inputStream= new BufferedInputStream(new
FileInputStream(path));
        File file= new File(path);
        fileName = decodeFile(inputStream);
        inputStream.close();
    }

    public String getFile() {
        return fileName;
    }

    private String decodeFile(BufferedInputStream inputStream) throws
IOException {
        int lengthOfFileName = inputStream.read();
        int fileType= inputStream.read();
        String name="" ;
        while(name.length()<lengthOfFileName){
            int value= inputStream.read();
            name= name+(char)value;
        }
        if(fileType==1){
            File file1= new File(name);
                     // System.out.println(name+" folder");//folder
            if(!file1.exists())
                 file1.mkdir();
            decodeFile(inputStream);
        }else if(fileType==0) {
                          decode_file(inputStream,name);//Unzip the file
        }else {
            // it decompress the file by order ,if the type isn~t one
or zero ,it means that it reaches the end of the file
//            System.exit(0);
        }
        return name;
    }

    private void decode_file(BufferedInputStream inputStream, String
str) throws IOException {
        BufferedOutputStream outputStream =new BufferedOutputStream(new
FileOutputStream(str));
        int[] str_length= new int [256];

        int value;
        int bb=24;
```

```
            int lengthOfChar=0;
            System.out.println(inputStream.available());
            for(int j=0;j<4;j++){
                value=inputStream.read();
                           // System.out.println("32-bit encoding:"+value);
                int tt=value<<bb;
                bb=bb-8;
                lengthOfChar=lengthOfChar|tt;
            }
                 // length=yy;//read the length of the character

                 // System.out.println(yy+"length");///////////////
            //System.out.println(inputStream.available());

            for (int i=0;i<256;i++){
                value= inputStream.read();
                str_length[i]=value;
                     } // write the length of the hash table to the array

            for(int j =0;j<256;j++) {
                String s = "";
                if (str_length[j] != 0) {
                    int x=0;
                    while(x<str_length[j]){
                        if(code.size()==0){
                            value=inputStream.read();
                            read(value);
                        }
                        s=s+code.get(0);
                        code.remove(0);
                        x++;
                    }
                    hashMap.put(s, j);
                }
                     }//Build a hash table

                   // System.out.println( "code size after constructing the
hash table" + code.size());



            int written_length =0;
            String theCodeOfRead="";
            while (written_length<lengthOfChar){
                if(code.size()==0){
                    value=inputStream.read();
                    read(value);
                }
                theCodeOfRead=theCodeOfRead+code.get(0);
                code.remove(0);
                if(hashMap.containsKey(theCodeOfRead)){
                   /// System.out.println(ss+ "   code  ");
                    outputStream.write(hashMap.get(theCodeOfRead));
                    written_length++;
                    theCodeOfRead="";
                }

            }
            code.clear();
            hashMap.clear();
            outputStream.close();
            decodeFile(inputStream);

        }
        private static void read(int x ){
            for(int i=0;i<8;i++){
                int y=x>> readCount;
                readCount--;
```

```
            if(readCount==-1)
                readCount=7;
            y= y&1;
            code.add(y);
        }
    }



//    public static void main(String[] args) throws IOException {
//        long start = System.currentTimeMillis();
//       decode decode= new decode("file/qq.zip");
//        long end = System.currentTimeMillis();
//        System.out.println("execute time:"+(end - start)+"ms");
//
//    }

}
```

C. Main.java

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package stega;

import java.io.BufferedWriter;
import javax.crypto.Cipher;
import javax.crypto.SecretKey;
import javax.crypto.SecretKeyFactory;
import javax.crypto.spec.IvParameterSpec;
import javax.crypto.spec.PBEKeySpec;
import javax.crypto.spec.SecretKeySpec;
import java.nio.charset.StandardCharsets;
import java.security.spec.KeySpec;
import java.util.Base64;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.io.FileWriter;
import java.io.IOException;
import java.nio.file.Files;
import java.nio.file.Paths;
import java.text.DecimalFormat;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.swing.JFileChooser;
import javax.swing.JOptionPane;
import java.util.zip.*;


/**
 *
 * @author RizkySatriaWibowo
 */

public class Main extends javax.swing.JFrame {
    String desktopPath = System.getProperty("user.home") + "\\Desktop";
    private static final String SALT = "nc547w4ryn3845c485yc4t";
    public String outputFolder = desktopPath + "\\stegano";

    public static String encrypt(String path, String key) {
```

```
      try {
        byte[] iv = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
        IvParameterSpec ivspec = new IvParameterSpec(iv);

        SecretKeyFactory factory =
SecretKeyFactory.getInstance("PBKDF2WithHmacSHA256");
        KeySpec spec = new PBEKeySpec(key.toCharArray(),
SALT.getBytes(), 65536, 256);
        SecretKey tmp = factory.generateSecret(spec);
        SecretKeySpec secretKey = new SecretKeySpec(tmp.getEncoded(),
"AES");

        Cipher cipher = Cipher.getInstance("AES/CBC/PKCS5Padding");
        cipher.init(Cipher.ENCRYPT_MODE, secretKey, ivspec);
        return Base64.getEncoder()

.encodeToString(cipher.doFinal(Files.readAllBytes(Paths.get(path))));
      } catch (Exception e) {
        JOptionPane.showMessageDialog(null, "Error while encrypting: "
+ e.toString());
      }
      return null;
    }

    public static boolean decrypt(String path, String key) {
        try {
          byte[] strToDecrypt = Files.readAllBytes(Paths.get(path));
          byte[] iv = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
          IvParameterSpec ivspec = new IvParameterSpec(iv);

          SecretKeyFactory factory =
SecretKeyFactory.getInstance("PBKDF2WithHmacSHA256");
          KeySpec spec = new PBEKeySpec(key.toCharArray(),
SALT.getBytes(), 65536, 256);
          SecretKey tmp = factory.generateSecret(spec);
          SecretKeySpec secretKey = new SecretKeySpec(tmp.getEncoded(),
"AES");

          Cipher cipher = Cipher.getInstance("AES/CBC/PKCS5PADDING");
          cipher.init(Cipher.DECRYPT_MODE, secretKey, ivspec);

          byte[] result =
cipher.doFinal(Base64.getDecoder().decode(strToDecrypt));

          Files.write(Paths.get(path), result);
          return true;
        } catch (Exception e) {
            JOptionPane.showMessageDialog(null, "Error while
encrypting: " + e.toString());
        }
        return false;
    }

    public void deleteFile(String path) {
        File inputFile  = new File(path);
        inputFile.delete();
    }

    public void makeOutputDir() {
        File directory = new File(desktopPath + "\\stegano");
        if(!directory.exists()) {
            directory.mkdir();
        }
    }

    private String zipFile(String filePath, String outputPath) {
        try {
            File file = new File(filePath);
```

```
            String zipFileName = outputPath + "\\" +
file.getName().concat(".zip");

            FileOutputStream fos = new FileOutputStream(zipFileName);
            ZipOutputStream zos = new ZipOutputStream(fos);

            zos.putNextEntry(new ZipEntry(file.getName()));

            byte[] bytes = Files.readAllBytes(Paths.get(filePath));
            zos.write(bytes, 0, bytes.length);
            zos.closeEntry();
            zos.close();

            return zipFileName;

        } catch (FileNotFoundException ex) {
            System.err.format("The file %s does not exist", filePath);
        } catch (IOException ex) {
            System.err.println("I/O error: " + ex);
        }
        return null;
    }

    /**
     * Creates new form Main
     */
    public Main() {
        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() {

        inputFileTxt = new javax.swing.JTextField();
        jButton2 = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle("AES");
        setLocation(new java.awt.Point(400, 300));

        jButton2.setText("...");
        jButton2.addActionListener(new java.awt.event.ActionListener()
{
            public void actionPerformed(java.awt.event.ActionEvent evt)
{
                jButton2ActionPerformed(evt);
            }
        });

        jLabel1.setText("Pilih File Target");

        jButton3.setText("Buka");
        jButton3.addActionListener(new java.awt.event.ActionListener()
{
            public void actionPerformed(java.awt.event.ActionEvent evt)
{
```

```
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setText("Kunci");
        jButton4.addActionListener(new java.awt.event.ActionListener()
{
            public void actionPerformed(java.awt.event.ActionEvent evt)
{
                jButton4ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup()
                .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.
LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(inputFileTxt)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton2,
javax.swing.GroupLayout.PREFERRED_SIZE, 40,
javax.swing.GroupLayout.PREFERRED_SIZE))
                    .addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.
LEADING)
                            .addComponent(jLabel1)
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButton4)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton3)))
                        .addGap(0, 248, Short.MAX_VALUE)))
                .addContainerGap())
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)

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

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.
BASELINE)
                    .addComponent(inputFileTxt,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jButton2))

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

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.
BASELINE)
                    .addComponent(jButton4)
                    .addComponent(jButton3))
```

```
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        );

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

    private void jButton2ActionPerformed(java.awt.event.ActionEvent
evt) {
        // Pilih file target
        JFileChooser j = new JFileChooser();
        int r = j.showOpenDialog(null);

        if(r == JFileChooser.APPROVE_OPTION)
        {

inputFileTxt.setText(j.getSelectedFile().getAbsolutePath());
        }
    }

    private void jButton4ActionPerformed(java.awt.event.ActionEvent
evt) {

        // Dapatkan inputan key
        String key = JOptionPane.showInputDialog("Masukkan Key");

        // tampikan pesan jika tidak memasukkan key
        if(key == null) {
            JOptionPane.showMessageDialog(null, "Masukkan Key!");
        } else {
            // Lakukan AES encryption pada file target
            String encryptedString = encrypt(inputFileTxt.getText(),
key);

            try {

                BufferedWriter writer = new BufferedWriter(new
FileWriter(inputFileTxt.getText()));
                writer.append(encryptedString);
                writer.close();

                Compress compress = new
Compress(inputFileTxt.getText());
                String compressedFile = compress.getFile();

                deleteFile(inputFileTxt.getText());

                JOptionPane.showMessageDialog(null, "Selesai");

            } catch (IOException ex) {
                JOptionPane.showMessageDialog(null, ex.getMessage());
            }
        }

    }

    private void jButton3ActionPerformed(java.awt.event.ActionEvent
evt) {
        try {
            // Dapatkan inputan key
            String key = JOptionPane.showInputDialog("Masukkan Key");

            // tampikan pesan jika tidak memasukkan key
            if(key == null) {
                JOptionPane.showMessageDialog(null, "Masukkan Key!");
            } else  {
                // ambil alamat file dati input text
                String inputFile = inputFileTxt.getText();
```

```
                Decompress dpress = new Decompress(inputFile);
                String fileDecompress = dpress.getFile();

                if(decrypt(fileDecompress, key)) {
                    deleteFile(inputFileTxt.getText());
                    JOptionPane.showMessageDialog(null, "Selesai");
                }
                else {
                    JOptionPane.showMessageDialog(null, "Gagal membuka
file");
                }


            }


        } catch (IOException ex) {
            JOptionPane.showMessageDialog(null, ex.getMessage());
        }
    }

    /**
     * @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.htm
l
         */
        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(Main.class.getName()).log(java.util.
logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(Main.class.getName()).log(java.util.
logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(Main.class.getName()).log(java.util.
logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(Main.class.getName()).log(java.util.
logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new Main().setVisible(true);
            }
```

```
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JTextField inputFileTxt;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JLabel jLabel1;
    // End of variables declaration
}
```

D. Node.java

```
/*
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Properties.
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 * and open the template in the editor.
 */
package stega;

/**
 *
 * @author RizkySatriaWibowo
 */
public class Node {
    public  Node rightNode;
    public  Node leftNode;
    public int weight;
    public int character;

    public Node(int weight){
        this.weight = weight;
    }
    public Node(int weight,int character){
        this.weight=weight;
        this.character =character;
    }
    public  Node (int weight,Node leftNode,Node rightNode){
        this.weight= weight;
        this.leftNode= leftNode;
        this.rightNode= rightNode;
    }

    public void setRightNode(Node rightNode){
        this.rightNode = rightNode;
    }
     public void setLeftNode(Node leftNode){
        this.leftNode= leftNode;
     }
     public void setWeight(int weight){
        this.weight =weight;
     }
     public void setCharacter(char character){
        this.character= character;
     }
     public Node getRightNode(){
        return this.rightNode;
    }
    public Node getLeftNode(){
        return this.leftNode;
   }
      public int  getCharacter(){
        return this.character;
    }
      public int getWeight(){
        return this.weight ;
}
```

```
     public int  compareTo(Node N){
        if(this.weight>N.weight)return 1;
        else if(this.weight<N.weight)
            return -1;
        else return 0;
     }
    }
```

E. huffmanTree.java

```
/*
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 * and open the template in the editor.
 */
package stega;

/**
 *
 * @author RizkySatriaWibowo
 */
import java.util.*;
public class huffmanTree {
public Node root;
public huffmanTree(List<Node> nodes){
    nodes =new ArrayList<>(nodes);
    sortList(nodes);
    while (nodes.size()>1){
        creatAndReplace(nodes);
    }
    if(nodes.size()==0)
        root=null;
    else
        root = nodes.get(0);
}
    private static void creatAndReplace(List<Node> nodes) {
        Node left = nodes.get(0);
        Node right = nodes.get(1);
        Node parent = new Node(left.weight + right.weight,-1);
        parent.setLeftNode(left);
        parent.setRightNode(right);
        nodes.remove(0);
        nodes.remove(0);
        nodes.add(parent);
        sortList(nodes);
    }

    public static   Comparator<Node> comparator = (o1, o2) -> {
        if(o1.weight>o2.weight) {
            return 1;
        }else
        if(o1.weight==o2.weight){
            return 0;
        }else {
            return -1;
        }
    };
    private static void sortList(List<Node> nodes) {
        Collections.sort(nodes, comparator );
     }

   public  void print(Node root, String string,HashMap map){
        if(root!=null) {
            if (root.getRightNode() == null & root.getLeftNode() ==
null) {
```

```
            // System.out.println(root.character + " corresponding
code " + string);
                map.put(root.character, string);
            }
            if (root.getLeftNode() != null) {
                print(root.getLeftNode(), string + "0", map);
            }
            if (root.getRightNode() != null) {
                print(root.getRightNode(), string + "1", map);
            }
        }
    }

}
```

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