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SEKOLAH TINGGI MANAJEMEN INFORMATIKA DAN KOMPUTER  
**STMIK ROYAL**

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Website: www.royal.ac.id, homepage: www.stmikroyal.ac.id, e-mail: stmik@royal.ac.id

Kisaran, 31 Mei 2023

Nomor : 026-213/STMIK-R/PP/V/2023

Hal : Permohonan Riset

Kepada Yth,

**Pemilik Industry Aya Kec. Air Batu**

di\_

Tempat

Dengan Hormat,

Semoga Tuhan Yang Maha Esa senantiasa memberikan kemudahan bagi kita semua dalam menjalankan aktivitas sehari-hari.

STMIK Royal Kisaran sebagai salah satu perguruan tinggi penyelenggaraan program pendidikan Strata 1 (S1) dengan ini mengajukan permohonan kepada Bapak/Ibu agar kiranya dapat menerima Mahasiswa/I kami melaksanakan kegiatan Riset yang dilaksanakan pada tanggal **31 Mei 2023 - 31 Juni 2023**. Berikut ini data mahasiswa yang akan melaksanakan Riset :

No	Nama Mahasiswa	Program Studi	L/P	NIM
1	Intan Purnama Sari Situmorang	Sistem Informasi-S1	P	19.22.0094

Adapun Tujuan dilaksanakannya Riset ini untuk Menyelesaikan Penulisan Skripsi Program Strata 1 (S1) STMIK Royal. Judul Skripsi : "*Analisa Komperasi Least Square dan SES dalam Meramalkan Bahan Baku Pembuatan Gula Merah*".

Demikian permohonan ini kami sampaikan. Atas perhatian, kesediaan, dan kerjasama yang baik kami ucapkan terima kasih.

Hormat Kami

Ketua,



**Wan Mariatul Kifti, M.M.**

NIDN. 0114057302

Tembusan :

# HOME INDUSTRY AYA

JL. Sijabut Teratai Dusun II  
Kecamatan Air Batu, Kabupaten Asahan

Perihal : **Balasan Riset**

Sijabut Teratai, 7 Juni 2023

Kepada Yth,  
Ibu Wan Mariatul Kifti, SE,M.M.  
Selaku Ketua STMIK Royal Kisaran  
Di Tempat.

Dengan Hormat,

Berdasarkan surat dari STMIK Royal Kisaran, tanggal 31 Mei 2023, Perihal Permohonan Riset.

Sehubungan dengan hal tersebut, maka melalui surat ini kami menerangkan bahwa mahasiswa yang akan melakukan penelitian:

Nama : Intan Purnama Sari Situmorang

Nim : 19220094

Telah kami setuju untuk melaksanakan penelitian di Home Industry Aya sebagai syarat penyusunan skripsi dengan judul : **“Analisis Komparasi Least Square dan SES dalam Meramalkan Bahan Baku Pembuatan Gula Merah”**

Demikian surat ini disampaikan untuk dipergunakan sebagaimana semestinya.

Hormat Kami

Pemilik,



Untung Situmorang



Sekolah Tinggi Manajemen Informatika dan Komputer Royal

**STMIK ROYAL**

**Program Studi Sistem Informasi**



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**LEMBAR KONSULTASI SKRIPSI**

Nama Mahasiswa : INTAN PURNAMA SARI SITUMORANG  
NIM : 19220094  
Program Studi : Sistem Informasi  
Judul Skripsi/TA : ANALISA KOMPARASI LEAST SQUARE DAN SES DALAM MERAMALKAN BAHAN BAKU PEMBUATAN GULA MERAH  
Dosen Pembimbing : 1. RIZKY FAUZIAH, S.Sos., M.Kom., M.Ikom.  
2. ABDUL KARIM SYAHPUTRA, S.Kom., M.Kom.  
Lembar Konsultasi : Pembimbing 1  
Tanggal Pertemuan Pertama\* : 7 Juni 2023

PERTEMUAN/ TANGGAL	MATERI BAHASAN	PARAF DOSEN	KETERANGAN
07-06-2023	Lengkapi data pada latar belakang. Penulisan disesuaikan dengan buku panduan penulisan.		BAB I (Revisi)
17-06-2023	Perhatikan kerapian penulisan. Silahkan lanjutkan ke Bab II.		BAB I (ACC)
22-06-2023	Tambahkan subbab tentang bahan baku gula merah. Hipotesis perlu disederhanakan.		BAB II (Revisi)
25-06-2023	Silahkan lanjutkan ke Bab III		BAB II (ACC)
27-06-2023	silahkan lanjutkan ke seminar proposal		BAB III (ACC)
27-06-2023			Seminar Proposal (ACC)
23-08-2023	perbaiki perhitungan, masukkan data paling terbaru agar akurasi lebih baik		BAB IV (Revisi)
05-09-2023	lanjutkan ke perancangan program		BAB IV (ACC)
05-09-2023	selesaikan penulisan		BAB V (ACC)
01-10-2023	Silahkan lanjutkan ke seminar hasil		BAB VI (ACC)
01-10-2023			Pengujian Alat/Aplikasi (ACC)
01-10-2023			Seminar Hasil (ACC)
19-10-2023			Sidang Meja Hijau (ACC)

Kisaran, 23 Oktober 2023

Ka. Prodi Sistem Informasi



**William Ramdhan, M.Kom.**  
NIDN: 0130048702



Sekolah Tinggi Manajemen Informatika dan Komputer Royal

**STMIK ROYAL**

**Program Studi Sistem Informasi**



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Website: www.stmik.royal.ac.id, Homepage: prodisi.stmik.royal.ac.id, Email: prodisi\_si@royal.ac.id

**LEMBAR KONSULTASISKRIPSI**

Nama Mahasiswa : INTAN PURNAMA SARI SITUMORANG  
NIM : 19220094  
Program Studi : Sistem Informasi  
Judul Skripsi/TA : ANALISA KOMPARASI LEAST SQUARE DAN SES DALAM MERAMALKAN BAHAN BAKU PEMBUATAN GULA MERAH  
Dosen Pembimbing : 1. RIZKY FAUZIAH, S.Sos., M.Kom., M.Ikom.  
2. ABDUL KARIM SYAHPUTRA, S.Kom., M.Kom.  
Lembar Konsultasi : Pembimbing 2  
Tanggal Pertemuan Pertama : 14 Juni 2023

PERTEMUAN/ TANGGAL	MATERI BAHASAN	PARAF DOSEN	KETERANGAN
14-06-2023	1. Perhatikan penulisan imbuhan di- dan ke-. Jika kata tempat dipisahkan, selain itu disatukan. 2. Perhatikan penulisan kata baku. Selalu Cek di KBBI 3. Untuk bentuk tabel jika lebih dari satu halaman, maka di halaman yang berikutnya, harus dibuat lagi Judul tabelnya ditambah "(Lanjutan)" di akhir judul tabel, lalu header tabelnya kembali dibuat.		BAB I (Revisi)
17-06-2023	ACC Bab 1. Silahkan lanjutkan Bab berikutnya		BAB I (ACC)
26-06-2023	1. Perhatikan penulisan imbuhan di- dan ke-. Jika kata tempat dipisahkan, selain itu disatukan. 2. Perhatikan penulisan kata baku. Selalu Cek di KBBI 3. Perhatikan penulisan bahasa asing. Harus cetak miring 4. Perhatikan cetak tebal pada list point. Jika bukan Sub judul, tidak Bold 5. Perhatikan jenis dan ukuran huruf/font		BAB II (Revisi)
03-07-2023	ACC Bab 2. Silahkan lanjutkan Bab berikutnya		BAB II (ACC)
04-07-2023	ACC Bab 3. Siapkan berkas untuk Seminar Proposal		BAB III (ACC)
05-07-2023	ACC Seminar Proposal		Seminar Proposal (ACC)
11-09-2023	ACC Bab 4		BAB IV (ACC)
18-09-2023	ACC Bab 5		BAB V (ACC)
02-10-2023	ACC Bab 6		BAB VI (ACC)
02-10-2023	ACC Sistem		Pengujian Alat/Aplikasi (ACC)
03-10-2023	ACC Seminar Hasil		Seminar Hasil (ACC)
19-10-2023	ACC Sidang Meja Hijau		Sidang Meja Hijau (ACC)

Kisaran, 21 Oktober 2023

Ka. Prodi Sistem Informasi



**William Ramdhan, M.Kom.**  
NIDN: 0130048702

## LIST PROGRAM

### 1. FrmLogin.vb

```
Public Class FrmLogin

    Private Sub btnLogin_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles BtnLogin.Click
        dr = openDR("SELECT * FROM tb_user WHERE user='" & TxtUsername.Text & "' AND pass='" & TxtPassword.Text & "'")
        If dr.Read Then
            User = Dr("user")
            Level = Dr("level")
            FrmUtama.Show()
            Me.Close()
        Else
            msgError("Salah kombinasi username dan password")
            TxtUsername.Focus()
        End If
    End Sub

    Private Sub txtUsername_KeyPress(ByVal sender As System.Object, ByVal e As System.Windows.Forms.KeyPressEventArgs) Handles TxtUsername.KeyPress
        If e.KeyChar = Chr(13) Then
            TxtPassword.Focus()
        End If
    End Sub

    Private Sub txtPassword_KeyPress(ByVal sender As System.Object, ByVal e As System.Windows.Forms.KeyPressEventArgs) Handles TxtPassword.KeyPress
        If e.KeyChar = Chr(13) Then
            btnLogin_Click(Nothing, Nothing)
        End If
    End Sub

    Private Sub btnKeluar_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles BtnKeluar.Click
        Me.Close()
    End Sub

    Private Sub TxtPassword_TextChanged(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles TxtPassword.TextChanged

    End Sub
End Class
```

### 2. FrmUtama.vb

```
Public Class FrmUtama

    Private Sub FrmUtama_Load(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles MyBase.Load
```

```

        sb1.Text = "User: " & user
        sb2.Text = Format(Date.Now, "dd MMMM yyyy HH:mm:ss")
    End Sub

    Private Sub Timer1_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer1.Tick
        sb2.Text = Format(Date.Now, "dd MMMM yyyy HH:mm:ss")
    End Sub

    Private Sub BtnHitung_Click(ByVal sender As System.Object, ByVal eAs
System.EventArgs) Handles BtnSES.Click
        Dim f As New FrmSES
        f.ShowAsChild(Me)
    End Sub

    Private Sub MnPassword_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs)
        FrmPassword.ShowDialog()
    End Sub

    Private Sub BtnLapRangking_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs)
        LapSES.ShowAsChild(Me)
    End Sub

    Private Sub BtnLogout_Click(ByVal sender As System.Object, ByVal eAs
System.EventArgs) Handles BtnLogout.Click
        FrmLogin.Show()
        Me.Close()
    End Sub

    Private Sub BtnPassword_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles BtnPassword.Click
        Dim f As New FrmPassword
        f.ShowDialog()
    End Sub

    Private Sub BtnNilai_Click(sender As Object, e As EventArgs) Handles
BtnNilai.Click
        Dim f As New FrmNilai
        f.ShowAsChild(Me)
    End Sub

    Private Sub BtnPeriode_Click(sender As Object, e As EventArgs)
Handles BtnPeriode.Click
        Dim f As New FrmPeriode
        f.ShowAsChild(Me)
    End Sub

    Private Sub BtnJenis_Click(sender As Object, e As EventArgs) Handles
BtnJenis.Click
        Dim f As New FrmJenis
        f.ShowAsChild(Me)
    End Sub

    Private Sub BtnLS_Click(sender As System.Object, e As
System.EventArgs) Handles BtnLS.Click
        Dim f As New FrmLS
        f.ShowAsChild(Me)
    End Sub

```

```

Private Sub FrmUtama_Activated(sender As System.Object, e As
System.EventArgs) Handles MyBase.Activated
    If Level <> "admin" Then
        BtnJenis.Enabled = False
        BtnPeriode.Enabled = False
        BtnNilai.Enabled = False
    Else
        BtnJenis.Enabled = True
        BtnPeriode.Enabled = True
        BtnNilai.Enabled = True
    End If
End Sub

Private Sub BtnHasil_Click(sender As System.Object, e As
System.EventArgs) Handles BtnHasil.Click
    Dim f As New FrmHasil
    f.ShowAsChild(Me)
End Sub
End Class

```

### 3. FrmJenis.vb

```

Public Class FrmJenis

    Private Sub BtnRefresh_Click(sender As Object, e As EventArgs)
Handles BtnRefresh.Click
        Dgv.DataSource = OpenDT("SELECT Kode_jenis, Nama_jenis FROM
tb_jenis WHERE kode_jenis LIKE @0 OR nama_jenis LIKE @0 ORDER BY
kode_jenis", "%" & TxtCari.Text & "%")
    End Sub

    Private Sub FrmJenis_Load(sender As Object, e As EventArgs) Handles
MyBase.Load
        Dgv.SetDefault()
        BtnRefresh_Click(sender, e)
        TxtCari.Hide()
        BtnRefresh.Hide()
    End Sub

    Private Sub FrmJenis_KeyDown(sender As Object, e As KeyEventArgs)
Handles MyBase.KeyDown
        If isRefresh(e) Then BtnRefresh_Click(sender, e)
        If isClose(e) Then BtnKeluar_Click(sender, e)
    End Sub

    Private Sub TxtCari_KeyPress(sender As Object, e As
KeyPressEventArgs) Handles TxtCari.KeyPress
        If isEnter(e) Then BtnRefresh_Click(sender, e)
    End Sub

    Private Sub BtnKeluar_Click(sender As Object, e As EventArgs)
Handles BtnKeluar.Click
        Me.Close()
    End Sub

    Private Sub BtnHapus_Click(sender As Object, e As EventArgs) Handles
BtnHapus.Click

```



```

        If Not Dgv.CurrentCell Is Nothing Then
            If msgAsk("Hapus data?") = vbYes Then
                Delete("tb_jenis", "kode_jenis=@0",
Dgv.getSelAt("kode_jenis"))
                Delete("tb_nilai", "kode_jenis=@0",
Dgv.getSelAt("kode_jenis"))
                msgInfo("Data terhapus!")
                BtnRefresh_Click(sender, e)
            End If
        End If
    End Sub

    Private Sub BtnTambah_Click(sender As Object, e As EventArgs)
Handles BtnTambah.Click
        Dim f As New FrmJenisTambah
        f.EditState = False
        If f.ShowDialog = DialogResult.Yes Then
            BtnRefresh_Click(sender, e)
        End If
    End Sub

    Private Sub BtnUbah_Click(sender As Object, e As EventArgs) Handles
BtnUbah.Click
        If Not Dgv.CurrentCell Is Nothing Then
            Dim f As New FrmJenisTambah
            f.EditState = True
            f.TxtKode.Text = Dgv.getSelAt("kode_jenis")
            If f.ShowDialog = DialogResult.Yes Then
                BtnRefresh_Click(sender, e)
            End If
        End If
    End Sub
End Class

```

### 1. FrmJenisTambah.vb

```

Public Class FrmJenisTambah
    Public EditState As Boolean = False

    Private Sub BtnKeluar_Click(sender As Object, e As EventArgs) Handles
BtnKeluar.Click
        Me.Close()
    End Sub

    Private Sub BtnSimpan_Click(sender As Object, e As EventArgs) Handles
BtnSimpan.Click
        If TxtKode.Text = "" Or TxtNama.Text = "" Then
            MsgError("Field bertanda * tidak boleh kosong!")
        ElseIf Not EditState And OpenDT("SELECT * FROM tb_jenis WHERE
kode_jenis=@0", TxtKode.Text).Rows.Count > 0 Then
            MsgError("Kode sudah ada!")
        Else
            If EditState Then
                Execute("UPDATE tb_jenis SET nama_jenis=@0 WHERE
kode_jenis=@1", TxtNama.Text, TxtKode.Text)
            Else
                Execute("INSERT INTO tb_jenis(kode_jenis, nama_jenis)
VALUES (@0, @1)", TxtKode.Text, TxtNama.Text)
            End If
        End If
    End Sub
End Class

```

```

        Execute("INSERT INTO tb_nilai(kode_periode, kode_jenis,
nilai) SELECT kode_periode, @0, 0 FROM tb_periode", TxtKode.Text)
    End If
    MsgBox("Data tersimpan")
    Me.DialogResult = Windows.Forms.DialogResult.Yes
    Me.Close()
End If
End Sub

Private Sub BtnAuto_Click(sender As Object, e As EventArgs) Handles
BtnAuto.Click
    TxtKode.Text = KodeOtomatis("kode_jenis", "tb_jenis", "J", 2)
End Sub

Private Sub FrmJenisTambah_Load(sender As Object, e As EventArgs)
Handles MyBase.Load
    BtnAuto.Visible = Not EditState
    TxtKode.Enabled = Not EditState
    If EditState Then
        Dr = OpenDR("SELECT * FROM tb_jenis WHERE kode_jenis=@0",
TxtKode.Text)
        If Dr.Read() Then
            TxtKode.Text = Dr("kode_jenis")
            TxtNama.Text = Dr("nama_jenis")
        End If
    Else
        BtnAuto_Click(sender, e)
    End If
End Sub

Private Sub FrmJenisTambah_KeyDown(sender As Object, e As KeyEventArgs)
Handles MyBase.KeyDown
    If isSave(e) Then BtnSimpan_Click(sender, e)
    If isClose(e) Then BtnKeluar_Click(sender, e)
End Sub
End Class

```

## 2. FrmPeriode.vb

```

Public Class FrmPeriode

    Private Sub BtnRefresh_Click(sender As Object, e As EventArgs) Handles
BtnRefresh.Click
        Dgv.DataSource = OpenDT("SELECT Kode_periode, Nama_periode FROM
tb_periode WHERE kode_periode LIKE @0 OR nama_periode LIKE @0 ORDER BY
kode_periode", "%" & TxtCari.Text & "%")
        Dgv.Columns("nama_periode").DefaultCellStyle.Format = "MMM-yyyy"
    End Sub

    Private Sub FrmPeriode_Load(sender As Object, e As EventArgs) Handles
MyBase.Load
        Dgv.SetDefault()
        BtnRefresh_Click(sender, e)
    End Sub

    Private Sub FrmPeriode_KeyDown(sender As Object, e As KeyEventArgs)
Handles MyBase.KeyDown
        If isRefresh(e) Then BtnRefresh_Click(sender, e)
    End Sub

```

```

        If isClose(e) Then BtnKeluar_Click(sender, e)
    End Sub

    Private Sub TxtCari_KeyPress(sender As Object, e As KeyPressEventArgs)
Handles TxtCari.KeyPress
        If isEnter(e) Then BtnRefresh_Click(sender, e)
    End Sub

    Private Sub BtnKeluar_Click(sender As Object, e As EventArgs) Handles
BtnKeluar.Click
        Me.Close()
    End Sub

    Private Sub BtnHapus_Click(sender As Object, e As EventArgs) Handles
BtnHapus.Click
        If Not Dgv.CurrentCell Is Nothing Then
            If msgAsk("Hapus data?") = vbYes Then
                Delete("tb_periode", "kode_periode=@0",
Dgv.getSelAt("kode_periode"))
                Delete("tb_nilai", "kode_periode=@0",
Dgv.getSelAt("kode_periode"))
                msgInfo("Data terhapus!")
                BtnRefresh_Click(sender, e)
            End If
        End If
    End Sub

    Private Sub BtnTambah_Click(sender As Object, e As EventArgs) Handles
BtnTambah.Click
        Dim f As New FrmPeriodeTambah
        f.EditState = False
        If f.ShowDialog = DialogResult.Yes Then
            BtnRefresh_Click(sender, e)
        End If
    End Sub

    Private Sub BtnUbah_Click(sender As Object, e As EventArgs) Handles
BtnUbah.Click
        If Not Dgv.CurrentCell Is Nothing Then
            Dim f As New FrmPeriodeTambah
            f.EditState = True
            f.TxtKode.Text = Dgv.getSelAt("kode_periode")
            If f.ShowDialog = DialogResult.Yes Then
                BtnRefresh_Click(sender, e)
            End If
        End If
    End Sub
End Class

```

### 3. FrmPeriodeTambah.vb

```

Public Class FrmPeriode

    Private Sub BtnRefresh_Click(sender As Object, e As EventArgs) Handles
BtnRefresh.Click
        Dgv.DataSource = OpenDT("SELECT Kode_periode, Nama_periode FROM
tb_periode WHERE kode_periode LIKE @0 OR nama_periode LIKE @0 ORDER BY
kode_periode", "%" & TxtCari.Text & "%")
    End Sub
End Class

```

```

        Dgv.Columns("nama_periode").DefaultCellStyle.Format = "MMM-yyyy"
    End Sub

    Private Sub FrmPeriode_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        Dgv.SetDefault()
        BtnRefresh_Click(sender, e)
    End Sub

    Private Sub FrmPeriode_KeyDown(sender As Object, e As KeyEventArgs) Handles MyBase.KeyDown
        If isRefresh(e) Then BtnRefresh_Click(sender, e)
        If isClose(e) Then BtnKeluar_Click(sender, e)
    End Sub

    Private Sub TxtCari_KeyPress(sender As Object, e As KeyPressEventArgs) Handles TxtCari.KeyPress
        If isEnter(e) Then BtnRefresh_Click(sender, e)
    End Sub

    Private Sub BtnKeluar_Click(sender As Object, e As EventArgs) Handles BtnKeluar.Click
        Me.Close()
    End Sub

    Private Sub BtnHapus_Click(sender As Object, e As EventArgs) Handles BtnHapus.Click
        If Not Dgv.CurrentCell Is Nothing Then
            If msgAsk("Hapus data?") = vbYes Then
                Delete("tb_periode", "kode_periode=@0",
                    Dgv.getSelAt("kode_periode"))
                Delete("tb_nilai", "kode_periode=@0",
                    Dgv.getSelAt("kode_periode"))
                msgInfo("Data terhapus!")
                BtnRefresh_Click(sender, e)
            End If
        End If
    End Sub

    Private Sub BtnTambah_Click(sender As Object, e As EventArgs) Handles BtnTambah.Click
        Dim f As New FrmPeriodeTambah
        f.EditState = False
        If f.ShowDialog = DialogResult.Yes Then
            BtnRefresh_Click(sender, e)
        End If
    End Sub

    Private Sub BtnUbah_Click(sender As Object, e As EventArgs) Handles BtnUbah.Click
        If Not Dgv.CurrentCell Is Nothing Then
            Dim f As New FrmPeriodeTambah
            f.EditState = True
            f.TxtKode.Text = Dgv.getSelAt("kode_periode")
            If f.ShowDialog = DialogResult.Yes Then
                BtnRefresh_Click(sender, e)
            End If
        End If
    End Sub
End Class

```

#### 4. FrmNilai.vb

```
Public Class FrmNilai
    Public DtNilai As New DataTable

    Private NilaiAwal As Integer = 0

    Private Sub FrmNilai_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
        Dgv.AllowUserToAddRows = False
        Dgv.AutoSizeColumnsMode = DataGridViewAutoSizeColumnsMode.AllCells
        isiGrid1()

        BtnRefresh.Hide()
        TxtCari.Hide()
    End Sub

    Sub isiGrid1()
        Dgv.Columns.Clear()

        Dgv.Columns.Add("kode_periode", "Kode")
        Dgv.Columns("kode_periode").ReadOnly = True
        Dgv.Columns.Add("nama_periode", "Nama")
        Dgv.Columns("nama_periode").ReadOnly = True

        Dr = OpenDR("SELECT * FROM tb_periode WHERE kode_periode LIKE @0 OR
nama_periode LIKE @0 ORDER BY kode_periode", "%" & TxtCari.Text & "%")
        While dr.Read()
            Dgv.Rows.Add(Dr("kode_periode"), Dr("nama_periode"))
        End While
        Dgv.Columns("nama_periode").DefaultCellStyle.Format = "MMM-yyyy"

        Dr = OpenDR("SELECT kode_jenis, nama_jenis FROM tb_jenis ORDER BY
kode_jenis")
        While dr.Read()
            Dgv.Columns.Add(dr(0), dr(1))
        End While

        For Each row As DataGridViewRow In Dgv.Rows
            Dr = OpenDR("SELECT * FROM tb_nilai WHERE kode_periode=@0 ORDER
BY kode_jenis", Dgv.getValueAt(row.Index, "kode_periode"))
            While dr.Read()
                Dgv(Dr("kode_jenis").ToString(), row.Index).Value =
Dr("nilai")
            End While
        Next
    End Sub

    Private Sub BtnRefresh_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnRefresh.Click
        isiGrid1()
    End Sub

    Private Sub TxtCari_KeyPress(sender As Object, e As KeyPressEventArgs)
Handles TxtCari.KeyPress
        If e.IsEnter Then isiGrid1()
    End Sub
End Class
```

```

Private Sub BtnKeluar_Click(sender As Object, e As EventArgs) Handles
BtnKeluar.Click
    Me.Close()
End Sub

Private Sub Dgv_CellFormatting(sender As Object, e As
DataGridViewCellFormattingEventArgs) Handles Dgv.CellFormatting
    If Not IsNothing(e.Value) Then
        If e.ColumnIndex >= 2 Then
            e.CellStyle.BackColor = Color.Yellow
        End If
    End If
End Sub

Private Sub Dgv_CellEndEdit(sender As Object, e As
DataGridViewCellEventArgs) Handles Dgv.CellEndEdit
    Dim nilai As Double = Val(Dgv(e.ColumnIndex, e.RowIndex).Value)
    Execute("UPDATE tb_nilai SET nilai=@0 WHERE kode_periode=@1 AND
kode_jenis=@2", nilai, Dgv(0, e.RowIndex).Value,
Dgv.Columns(e.ColumnIndex).Name)
    TxtKeterangan.Text = "Data tersimpan!"
End Sub
End Class

```

## 5. FrmNilai.vb

```

Public Class FrmNilai
    Public DtNilai As New DataTable

    Private NilaiAwal As Integer = 0

    Private Sub FrmNilai_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
        Dgv.AllowUserToAddRows = False
        Dgv.AutoSizeColumnsMode = DataGridViewAutoSizeColumnsMode.AllCells
        isiGrid1()

        BtnRefresh.Hide()
        TxtCari.Hide()
    End Sub

    Sub isiGrid1()
        Dgv.Columns.Clear()

        Dgv.Columns.Add("kode_periode", "Kode")
        Dgv.Columns("kode_periode").ReadOnly = True
        Dgv.Columns.Add("nama_periode", "Nama")
        Dgv.Columns("nama_periode").ReadOnly = True

        Dr = OpenDR("SELECT * FROM tb_periode WHERE kode_periode LIKE @0 OR
nama_periode LIKE @0 ORDER BY kode_periode", "%" & TxtCari.Text & "%")
        While dr.Read()
            Dgv.Rows.Add(Dr("kode_periode"), Dr("nama_periode"))
        End While
        Dgv.Columns("nama_periode").DefaultCellStyle.Format = "MMM-yyyy"
    End Sub
End Class

```

```

        Dr = OpenDR("SELECT kode_jenis, nama_jenis FROM tb_jenis ORDER BY
kode_jenis")
        While dr.Read()
            Dgv.Columns.Add(dr(0), dr(1))
        End While

        For Each row As DataGridViewRow In Dgv.Rows
            Dr = OpenDR("SELECT * FROM tb_nilai WHERE kode_periode=@0 ORDER
BY kode_jenis", Dgv.getValAt(row.Index, "kode_periode"))
            While dr.Read()
                Dgv(Dr("kode_jenis").ToString(), row.Index).Value =
Dr("nilai")
            End While
        Next
    End Sub

    Private Sub BtnRefresh_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnRefresh.Click
        isiGrid1()
    End Sub

    Private Sub TxtCari_KeyPress(sender As Object, e As KeyPressEventArgs)
Handles TxtCari.KeyPress
        If e.isEnter Then isiGrid1()
    End Sub

    Private Sub BtnKeluar_Click(sender As Object, e As EventArgs) Handles
BtnKeluar.Click
        Me.Close()
    End Sub

    Private Sub Dgv_CellFormatting(sender As Object, e As
DataGridViewCellFormattingEventArgs) Handles Dgv.CellFormatting
        If Not IsNothing(e.Value) Then
            If e.ColumnIndex >= 2 Then
                e.CellStyle.BackColor = Color.Yellow
            End If
        End If
    End Sub

    Private Sub Dgv_CellEndEdit(sender As Object, e As
DataGridViewCellEventArgs) Handles Dgv.CellEndEdit
        Dim nilai As Double = Val(Dgv(e.ColumnIndex, e.RowIndex).Value)
        Execute("UPDATE tb_nilai SET nilai=@0 WHERE kode_periode=@1 AND
kode_jenis=@2", nilai, Dgv(0, e.RowIndex).Value,
Dgv.Columns(e.ColumnIndex).Name)
        TxtKeterangan.Text = "Data tersimpan!"
    End Sub
End Class

```

## 6. FrmLS.vb

```

Public Class FrmLS
    Dim DtPeriode As DataTable
    Dim DtJenis As DataTable
    Dim DtNilai As DataTable
    Dim a As Integer

```

```

Dim MaxPeriode As Date

Dim AC As ClassFLS

Private Sub FrmHitung_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
    MaxPeriode = GetVar("SELECT MAX(nama_periode) FROM tb_periode")
    TxtNextPeriode.Text = 1
    TxtJenis.setDS(OpenDT("SELECT kode_jenis, nama_jenis FROM tb_jenis
ORDER BY kode_jenis"))

    Dim dt As DataTable = OpenDT("SELECT * FROM tb_nilai WHERE nilai <
0")

    Dgv1.SetDefault()
    awal()

    Label5.Hide()
    TxtRMSE.Hide()
End Sub

Sub awal()
    DtNilai = openDT("SELECT p.nama_periode, n.nilai FROM (tb_jenis j
INNER JOIN tb_nilai n ON j.kode_jenis = n.kode_jenis) INNER JOIN tb_periode
p ON n.kode_periode = p.kode_periode WHERE j.kode_jenis=@0 ORDER BY
p.nama_periode ", TxtJenis.Selected.Value.ToString())

    AC = New ClassFLS(DtNilai)
    With Dgv1
        .Columns.Clear()
        .Columns.Add("periode", "Periode")
        .Columns.Add("nilai", TxtJenis.Text)
        .Columns("periode").DefaultCellStyle.Format = "MMM-yyyy"
        For Each Row As KeyValuePair(Of Date, Nilai) In AC.DNilai
            Dgv1.Rows.Add(Row.Value.Periode, Row.Value.Y)
        Next
    End With
    TxtMAD.Text = ""
    TxtMAPE.Text = ""
    TxtMSE.Text = ""
    TxtRMSE.Text = ""
    BtnCetak.Enabled = False
End Sub

Private Sub btnKeluar_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnKeluar.Click
    Me.Close()
End Sub

Private Sub BtnHitung_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnHitung.Click
    If Val(TxtNextPeriode.Text) < 1 Then
        MsgBox("Masukkan next periode minimal 1")
        Exit Sub
    End If

    AC.hitung(MaxPeriode, Val(TxtNextPeriode.Text))
    With Dgv1
        .Columns.Clear()
        .Columns.Add("periode", "Periode")

```



```

.Columns("periode").DefaultCellStyle.Format = "MMM-yyyy"
.Columns.Add("y", "Y")
.Columns.Add("x", "X")
.Columns.Add("xy", "XY")
.Columns.Add("xsquare", "X ^ 2")
.Columns.Add("ft", "Ft")
.Columns.Add("err", "Ft-Yt")
.Columns.Add("errAbs", "|Ft-Yt|")
.Columns.Add("errSquare", "(Ft-Yt)^2")
.Columns.Add("errPerY", "|Ft-Yt|/Yt")

For Each Row As KeyValuePair(Of Date, Nilai) In AC.DFt
    .Rows.Add(Row.Value.Periode,
        Row.Value.Y,
        Row.Value.X,
        Row.Value.XY,
        Row.Value.XSquare,
        Math.Round(Row.Value.Ft, 2),
        Math.Round(Row.Value.Err, 2),
        Math.Round(Row.Value.ErrAbs, 2),
        Math.Round(Row.Value.ErrSquare, 2),
        Math.Round(Row.Value.ErrPerY, 2))
    If Row.Value.Periode > MaxPeriode Then
        Dim tanggal As Date = Row.Value.Periode
        .Rows(.Rows.Count - 1).DefaultCellStyle.BackColor =
Color.Yellow

        If GetVar("SELECT * FROM tb_hasil WHERE kode_jenis=@0
AND MONTH(tanggal)=@1 AND YEAR(tanggal)=@2", TxtJenis.SelectedValue,
tanggal.Month, tanggal.Year) Then
            execute("UPDATE tb_hasil SET ls=@0, ls_mape=@1
WHERE kode_jenis=@2 AND MONTH(tanggal)=@3 AND YEAR(tanggal)=@4",
Row.Value.Ft, AC.MAPE, TxtJenis.SelectedValue, tanggal.Month, tanggal.Year)
        Else
            execute("INSERT INTO tb_hasil (kode_jenis, tanggal,
ses, ses_mape, ls, ls_mape) VALUES (@0, @1, @2, @3, @4, @5)",
TxtJenis.SelectedValue, tanggal, 0, 0, Row.Value.Ft, AC.MAPE)
        End If
    Else
    End If
Next
End With
TxtMAD.Text = Math.Round(AC.MAD, 2)
TxtMSE.Text = Math.Round(AC.MSE, 2)
TxtRMSE.Text = Math.Round(AC.RMSE, 2)
TxtMAPE.Text = Math.Round(AC.MAPE * 100, 2) & "%"
BtnCetak.Enabled = True
End Sub

Private Sub TxtJenis_SelectedIndexChanged(sender As System.Object, e As
System.EventArgs) Handles TxtJenis.SelectedIndexChanged
    awal()
End Sub

Private Sub BtnCetak_Click(sender As System.Object, e As
System.EventArgs) Handles BtnCetak.Click
    Dim l As New LapLS
    Dim Rpt As New RptLS

```

```

    Dim Dt As DataTable = openDT("SELECT ' ' AS jenis, ' ' AS periode,
0.0 AS yt, 0.0 AS ft, 0.0 AS err, 0.0 AS errSquare, 0.0 AS errAbs, 0.0 AS
errPerY, ' ' AS MAD, ' ' AS MAPE, ' ' AS MSE, ' ' AS RMSE")
    Dim DtGrafik As DataTable = openDT("SELECT ' ' AS periode, 0.0 AS
nilai, 0.0 AS weight, 0.0 AS fx, 0.0 AS Err, 0.0 AS AbsErr, 0.0 AS
ErrKuadrat, 0.0 AS ErrDt")
    Dt.Clear()
    For Each row As DataGridViewRow In Dgv1.Rows
        Dim tanggal As Date = row.Cells("periode").Value
        Dt.Rows.Add(txtJenis.Text.ToUpper(), tanggal.ToString("MMM-
yyyy"), row.Cells("y").Value, row.Cells("ft").Value,
row.Cells("err").Value, row.Cells("errSquare").Value,
row.Cells("errAbs").Value, row.Cells("errPerY").Value, txtMAD.Text,
txtMAPE.Text, txtMSE.Text, txtRMSE.Text)

        Dim p As String = row.Cells(0).Value
        If (IsDate(row.Cells(0).Value)) Then
            Dim d As Date = row.Cells(0).Value
            p = d.ToString("yyyy-MM")
        End If

        If row.Index < Dgv1.Rows.Count - 3 Then
            DtGrafik.Rows.Add(p, row.Cells("y").Value, 0,
row.Cells("ft").Value, row.Cells("err").Value, row.Cells("errAbs").Value,
row.Cells("errSquare").Value, row.Cells("errPerY").Value)
        End If
    Next

    Rpt.SetDataSource(Dt)
    Rpt.Subreports(0).SetDataSource(DtGrafik)
    Rpt.Refresh()
    1.CrystalReportViewer1.ReportSource = Rpt
    1.CrystalReportViewer1.RefreshReport()
    1.ShowAsChild(Me.MdiParent)
End Sub
End Class

```

## 7. FrmSES.vb

```

Public Class FrmSES
    Dim DtPeriode As DataTable
    Dim DtJenis As DataTable
    Dim DtNilai As DataTable
    Dim a As Integer

    Dim MaxPeriode As Date

    Dim AC As ClassSES

    Private Sub FrmSES_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
        MaxPeriode = GetVar("SELECT MAX(nama_periode) FROM tb_periode")
        TxtNextPeriode.Text = 1
        TxtJenis.setDS(OpenDT("SELECT kode_jenis, nama_jenis FROM tb_jenis
ORDER BY kode_jenis"))
    End Sub

```

```

0")
Dim dt As DataTable = OpenDT("SELECT * FROM tb_nilai WHERE nilai <
Dgv1.SetDefault()
awal()
TxtAlpha.Text = 0.9

Label15.Hide()
TxtRMSE.Hide()
End Sub

Sub awal()
DtNilai = openDT("SELECT p.nama_periode, n.nilai FROM (tb_jenis j
INNER JOIN tb_nilai n ON j.kode_jenis = n.kode_jenis) INNER JOIN tb_periode
p ON n.kode_periode = p.kode_periode WHERE j.kode_jenis=@0 ORDER BY
p.nama_periode ", TxtJenis.Selected.Value.ToString())

AC = New ClassSES(DtNilai)
With Dgv1
.Columns.Clear()
.Columns.Add("periode", "Periode")
.Columns.Add("nilai", TxtJenis.Text)
.Columns("periode").DefaultCellStyle.Format = "MMM-yyyy"
For Each Row As KeyValuePair(Of Date, NilaiSES) In AC.DNilai
Dgv1.Rows.Add(Row.Value.Periode, Row.Value.Yt)
Next
End With
TxtMAD.Text = ""
TxtMAPE.Text = ""
TxtMSE.Text = ""
TxtRMSE.Text = ""
BtnCetak.Enabled = False
End Sub

Private Sub btnKeluar_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnKeluar.Click
Me.Close()
End Sub

Private Sub BtnHitung_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnHitung.Click
If Val(TxtNextPeriode.Text) < 1 Then
MsgInfo("Masukkan next periode minimal 1")
Exit Sub
ElseIf Val(TxtAlpha.Text) <= 0 Or Val(TxtAlpha.Text) >= 1 Then
MsgInfo("Masukkan nilai alpha antara 0 dan 1")
Exit Sub
End If

AC.hitung(MaxPeriode, Val(TxtNextPeriode.Text), Val(TxtAlpha.Text))
With Dgv1
.Columns.Clear()
.Columns.Add("periode", "Periode")
.Columns("periode").DefaultCellStyle.Format = "MMM-yyyy"
.Columns.Add("alpha", "Alpha")
.Columns.Add("yt", "Yt")
.Columns.Add("ayt", "a*Yt")
.Columns.Add("mina", "1-a")
.Columns.Add("ft", "Ft")
.Columns.Add("err", "Ft-Yt")

```

```

.Columns.Add("errAbs", "|Ft-Yt|")
.Columns.Add("errSquare", "(Ft-Yt)^2")
.Columns.Add("errPerY", "|Ft-Yt|/Yt")

For Each Row As KeyValuePair(Of Date, NilaiSES) In AC.DFt
.Rows.Add(Row.Value.Periode,
Row.Value.Alpha,
Math.Round(Row.Value.Yt, 2),
Math.Round(Row.Value.aYt, 2),
Row.Value.MinA,
Math.Round(Row.Value.Ft, 2),
Math.Round(Row.Value.Err, 2),
Math.Round(Row.Value.ErrAbs, 2),
Math.Round(Row.Value.ErrSquare, 2),
Math.Round(Row.Value.ErrPerY, 2))
If Row.Value.Periode > MaxPeriode Then
Dim tanggal As Date = Row.Value.Periode
.Rows(.Rows.Count - 1).DefaultCellStyle.BackColor =
Color.Yellow

If GetVar("SELECT * FROM tb_hasil WHERE kode_jenis=@0
AND MONTH(tanggal)=@1 AND YEAR(tanggal)=@2", TxtJenis.SelectedValue,
tanggal.Month, tanggal.Year) Then
Execute("UPDATE tb_hasil SET SES=@0, ses_mape=@1
WHERE kode_jenis=@2 AND MONTH(tanggal)=@3 AND YEAR(tanggal)=@4",
Row.Value.Ft, AC.MAPE, TxtJenis.SelectedValue, tanggal.Month, tanggal.Year)
Else
execute("INSERT INTO tb_hasil (kode_jenis, tanggal,
ses, ses_mape, ls, ls_mape) VALUES (@0, @1, @2, @3, @4, @5)",
TxtJenis.SelectedValue, tanggal, Row.Value.Ft, AC.MAPE, 0, 0)
End If
Else
End If
Next
End With
TxtMAD.Text = Math.Round(AC.MAD, 2)
TxtMSE.Text = Math.Round(AC.MSE, 2)
TxtRMSE.Text = Math.Round(AC.RMSE, 2)
TxtMAPE.Text = Math.Round(AC.MAPE * 100, 2) & "%"
BtnCetak.Enabled = True
End Sub

Private Sub TxtJenis_SelectedIndexChanged(sender As System.Object, e As
System.EventArgs) Handles TxtJenis.SelectedIndexChanged
awal()
End Sub

Private Sub BtnCetak_Click(sender As System.Object, e As
System.EventArgs) Handles BtnCetak.Click
Dim l As New LapSES
Dim Rpt As New RptSES

Dim Dt As DataTable = OpenDT("SELECT ' ' AS jenis, ' ' AS periode,
0.0 AS yt, 0.0 AS ft, 0.0 AS err, 0.0 AS errSquare, 0.0 AS errAbs, 0.0 AS
errPerY, ' ' AS MAD, ' ' AS MAPE, ' ' AS MSE, ' ' AS RMSE")
Dim DtGrafik As DataTable = OpenDT("SELECT ' ' AS periode, 0.0 AS
nilai, 0.0 AS weight, 0.0 AS fx, 0.0 AS Err, 0.0 AS AbsErr, 0.0 AS
ErrKuadrat, 0.0 AS ErrDt")
Dt.Clear()

```

```

For Each row As DataGridViewRow In Dgv1.Rows
    Dim tanggal As Date = row.Cells("periode").Value
    Dt.Rows.Add(TxtJenis.Text.ToUpper(), tanggal.ToString("MMM-
yyyy"), row.Cells("yt").Value, row.Cells("ft").Value,
row.Cells("err").Value, row.Cells("errSquare").Value,
row.Cells("errAbs").Value, row.Cells("errPerY").Value, TxtMAD.Text,
TxtMAPE.Text, TxtMSE.Text, TxtRMSE.Text)

    Dim p As String = row.Cells(0).Value
    If (IsDate(row.Cells(0).Value)) Then
        Dim d As Date = row.Cells(0).Value
        p = d.ToString("yyyy-MM")
    End If

    If row.Index < Dgv1.Rows.Count - 3 Then
        DtGrafik.Rows.Add(p, row.Cells("yt").Value, 0,
row.Cells("ft").Value, row.Cells("err").Value, row.Cells("errAbs").Value,
row.Cells("errSquare").Value, row.Cells("errPerY").Value)
    End If
Next

Rpt.SetDataSource(Dt)
Rpt.Subreports(0).SetDataSource(DtGrafik)
Rpt.Refresh()
1.CrystalReportViewer1.ReportSource = Rpt
1.CrystalReportViewer1.RefreshReport()
1.ShowAsChild(Me.MdiParent)
End Sub
End Class

```

## 8. FrmPassword.vb

```

Public Class FrmPassword

    Private Sub btnKeluar_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnKeluar.Click
        Me.Close()
    End Sub

    Private Sub BtnUbah_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles BtnUbah.Click
        dr = openDR("SELECT * FROM tb_user WHERE user='" & user & "' AND
pass='" & TxtPass1.Text & "'")
        If Not dr.Read Then
            msgError("Password lama salah!")
        ElseIf TxtPass2.Text <> TxtPass3.Text Then
            msgError("Password baru dan konfirmasi passwrod baru tidak
sama")
        ElseIf TxtPass2.Text.Length < 4 Then
            msgError("Password minimal 4 karakter")
        Else
            Execute("UPDATE tb_user SET pass='" & TxtPass2.Text & "' WHERE
user='" & user & "'")
            msgInfo("Password berhasil diubah!")
            Me.Close()
        End If
    End Sub

```

```

        End If
    End Sub
End Class

```

## 9. ClassFLS.vb

```

Public Class Nilai
    Public Periode As Date
    Public Y As Double = 0.0
    Public X As Double = 0.0
    Public XY As Double = 0.0
    Public XSquare As Double = 0.0
    Public Ft As Double = 0.0
    Public Err As Double
    Public ErrAbs As Double
    Public ErrSquare As Double
    Public ErrPerY As Double
End Class

Public Class ClassFLS

    Public DNilai As New Dictionary(Of Date, Nilai)
    Public DFt As New Dictionary(Of Date, Nilai)
    Public MAD As Double = 0.0
    Public MSE As Double = 0.0
    Public RMSE As Double = 0.0
    Public MAPE As Double = 0.0

    Public Sub New(DtNilai As DataTable)
        For Each row As DataRow In DtNilai.Rows
            Dim a As New Nilai
            a.Periode = row("nama_periode")
            a.Y = row("nilai")
            DNilai.Add(a.Periode, a)
        Next
    End Sub

    Public Sub hitung(MaxPeriode As Date, NexPeriode As Integer)
        Dim a As Integer = 1
        Dim TempFt As Double = DNilai.First().Value.Y
        Dim TNilai As Nilai = DNilai.First().Value

        DFt.Clear()

        Dim ni As Integer = 0
        MAD = 0.0
        MSE = 0.0
        RMSE = 0.0
        MAPE = 0.0

        Dim Ganjil As Boolean = True
        Dim JumlahData As Integer = DNilai.Count
        If JumlahData Mod 2 = 0 Then Ganjil = False

        Dim temp_x As Integer
        If Ganjil Then
            temp_x = -(JumlahData - 1) / 2
        Else

```

```

    temp_x = -JumlahData + 1
End If

Dim YTotal As Integer = 0
Dim XYTotal As Double = 0
Dim XSquareTotal As Integer = 0

For Each row As KeyValuePair(Of Date, Nilai) In DNilai

    Dim n As New Nilai
    n.Periode = row.Value.Periode
    n.Y = row.Value.Y
    n.X = temp_x
    n.XY = n.X * n.Y
    n.XSquare = n.X * n.X

    YTotal += n.Y
    XYTotal += n.XY
    XSquareTotal += n.XSquare
    If Ganjil Then
        temp_x += 1
    Else
        temp_x += 2
    End If

    DFt.Add(row.Key, n)
Next

Dim NilaiA As Double = YTotal / JumlahData
Dim NilaiB As Double = XYTotal / XSquareTotal

For Each Row As KeyValuePair(Of Date, Nilai) In DFt
    Row.Value.Ft = NilaiA + NilaiB * Row.Value.X

    Row.Value.Err = Row.Value.Ft - Row.Value.Y
    Row.Value.ErrAbs = Math.Abs(Row.Value.Ft - Row.Value.Y)
    Row.Value.ErrSquare = (Row.Value.Ft - Row.Value.Y) ^ 2
    Row.Value.ErrPerY = Math.Abs(Row.Value.Ft - Row.Value.Y) /
Row.Value.Y

    MAD += Row.Value.ErrAbs
    MSE += Row.Value.ErrSquare
    MAPE += Row.Value.ErrPerY
Next

MAD /= JumlahData
MSE /= JumlahData
MAPE /= JumlahData
RMSE = Math.Sqrt(MSE)

For i As Integer = 1 To NexPeriode
    Dim n As New Nilai
    n.Periode = MaxPeriode.AddMonths(i)
    n.Y = Nothing
    n.X = temp_x
    n.Ft = NilaiA + NilaiB * n.X
    DFt.Add(MaxPeriode.AddMonths(i), n)

    If Ganjil Then
        temp_x += 1
    End If
Next

```

```

        Else
            temp_x += 2
        End If
    Next
End Sub

End Class

```

## 10. ClassSES.vb

```

Public Class Nilai
    Public Periode As Date
    Public Y As Double = 0.0
    Public X As Double = 0.0
    Public XY As Double = 0.0
    Public XSquare As Double = 0.0
    Public Ft As Double = 0.0
    Public Err As Double
    Public ErrAbs As Double
    Public ErrSquare As Double
    Public ErrPerY As Double
End Class

Public Class ClassFLS

    Public DNilai As New Dictionary(Of Date, Nilai)
    Public DFt As New Dictionary(Of Date, Nilai)
    Public MAD As Double = 0.0
    Public MSE As Double = 0.0
    Public RMSE As Double = 0.0
    Public MAPE As Double = 0.0

    Public Sub New(DtNilai As DataTable)
        For Each row As DataRow In DtNilai.Rows
            Dim a As New Nilai
            a.Periode = row("nama_periode")
            a.Y = row("nilai")
            DNilai.Add(a.Periode, a)
        Next
    End Sub

    Public Sub hitung(MaxPeriode As Date, NexPeriode As Integer)
        Dim a As Integer = 1
        Dim TempFt As Double = DNilai.First().Value.Y
        Dim TNilai As Nilai = DNilai.First().Value

        DFt.Clear()

        Dim ni As Integer = 0
        MAD = 0.0
        MSE = 0.0
        RMSE = 0.0
        MAPE = 0.0

        Dim Ganjil As Boolean = True
        Dim JumlahData As Integer = DNilai.Count
        If JumlahData Mod 2 = 0 Then Ganjil = False
    End Sub

```



```

Dim temp_x As Integer
If Ganjil Then
    temp_x = -(JumlahData - 1) / 2
Else
    temp_x = -JumlahData + 1
End If

Dim YTotal As Integer = 0
Dim XYTotal As Double = 0
Dim XSquareTotal As Integer = 0

For Each row As KeyValuePair(Of Date, Nilai) In DNilai

    Dim n As New Nilai
    n.Periode = row.Value.Periode
    n.Y = row.Value.Y
    n.X = temp_x
    n.XY = n.X * n.Y
    n.XSquare = n.X * n.X

    YTotal += n.Y
    XYTotal += n.XY
    XSquareTotal += n.XSquare
    If Ganjil Then
        temp_x += 1
    Else
        temp_x += 2
    End If

    DFt.Add(row.Key, n)
Next

Dim NilaiA As Double = YTotal / JumlahData
Dim NilaiB As Double = XYTotal / XSquareTotal

For Each Row As KeyValuePair(Of Date, Nilai) In DFt
    Row.Value.Ft = NilaiA + NilaiB * Row.Value.X

    Row.Value.Err = Row.Value.Ft - Row.Value.Y
    Row.Value.ErrAbs = Math.Abs(Row.Value.Ft - Row.Value.Y)
    Row.Value.ErrSquare = (Row.Value.Ft - Row.Value.Y) ^ 2
    Row.Value.ErrPerY = Math.Abs(Row.Value.Ft - Row.Value.Y) /
Row.Value.Y

    MAD += Row.Value.ErrAbs
    MSE += Row.Value.ErrSquare
    MAPE += Row.Value.ErrPerY
Next

MAD /= JumlahData
MSE /= JumlahData
MAPE /= JumlahData
RMSE = Math.Sqrt(MSE)

For i As Integer = 1 To NexPeriode
    Dim n As New Nilai
    n.Periode = MaxPeriode.AddMonths(i)
    n.Y = Nothing
    n.X = temp_x

```

```

        n.Ft = NilaiA + NilaiB * n.X
        DFt.Add(MaxPeriode.AddMonths(i), n)

        If Ganjil Then
            temp_x += 1
        Else
            temp_x += 2
        End If
    Next
End Sub

End Class

```

## 11. ModAccess.vb

```

'Please don't remove this line, you can free use and developpe this module.
'2015 HerdiSoft (herdikayan@gmail.com)
'last updated: 2016-02-12

```

```

Imports vb = Microsoft.VisualBasic
Imports System.Globalization

Module ModAccess
    Private conn As New OleDb.OleDbConnection
    Private cmd As OleDb.OleDbCommand
    Private da As OleDb.OleDbDataAdapter
    Private ds As New DataSet
    Public dr As OleDb.OleDbDataReader
    Public user As String
    Public level As String = "admin"

    Private Sub connect()
        Try
            If conn.State = ConnectionState.Open Then Exit Sub
            'conn = New
            OleDb.OleDbConnection("Provider=Microsoft.ACE.OLEDB.12.0;Data Source=" &
            Application.StartupPath & "\db.accdb;Persist Security Info=False;")
            conn = New
            OleDb.OleDbConnection("Provider=Microsoft.Jet.OLEDB.4.0;Data Source=" &
            Application.StartupPath & "\db.mdb;Persist Security Info=False;")
            conn.Open()
            Application.CurrentCulture = New CultureInfo("en-US")
        Catch ex As Exception
            msgError("ERROR: " & ex.Message)
        End Try
    End Sub

    Public Function getConnection() As OleDb.OleDbConnection
        connect()
        Return conn
    End Function

    Public Function openDT(ByVal sql As String, ByVal ParamArray
    parameters() As Object) As DataTable
        Try
            closeDR()
            ds.Tables.Clear()

```

```

cmd = New OleDb.OleDbCommand(sql, getConnection())
For a As Integer = 0 To parameters.Count - 1
    cmd.Parameters.AddWithValue("@" & a, parameters(a))
Next
da = New OleDb.OleDbDataAdapter(cmd)
da.Fill(ds)

Return ds.Tables(0)
Catch ex As Exception
    msgError("ERROR: " & ex.Message & vbCrLf & sql)
Return Nothing
End Try
End Function

Public Function openDR(ByVal sql As String, ByVal ParamArray
parameters() As Object) As OleDb.OleDbDataReader
Try
    closeDR()
    cmd = New OleDb.OleDbCommand(sql, getConnection())
    For a As Integer = 0 To parameters.Count - 1
        cmd.Parameters.AddWithValue("@" & a, parameters(a))
    Next
    Return cmd.ExecuteReader()
Catch ex As Exception
    msgError("ERROR: " & ex.Message & vbCrLf & sql)
Return Nothing
End Try
End Function

Private Sub closeDR()
Try
    dr.Close()
Catch ex As Exception

End Try
End Sub

Public Sub execute(ByVal sql As String, ByVal ParamArray parameters()
As Object)
Try
    closeDR()
    cmd = New OleDb.OleDbCommand(sql, getConnection())
    For a As Integer = 0 To parameters.Count - 1
        cmd.Parameters.AddWithValue("@" & a, parameters(a))
    Next
    cmd.ExecuteNonQuery()
Catch ex As Exception
    msgError("ERROR: " & ex.Message & vbCrLf & sql)
End Try
End Sub

Public Function sRight(ByVal str As String, ByVal Length As Integer) As
String
Return vb.Right(str, Length)
End Function

Public Sub msgError(ByVal msg As String)
MsgBox(msg, vbExclamation + MsgBoxStyle.OkOnly, "Error")
End Sub

```

```

Public Sub msgInfo(ByVal msg As String)
    MsgBox(msg, vbInformation + MsgBoxStyle.OkOnly, "Informasi")
End Sub

Public Function msgAsk(ByVal msg As String) As MsgBoxResult
    Return MsgBox(msg, vbYesNo + vbQuestion, "Konfirmasi")
End Function

Public Function KodeOtomatis(field As String, table As String, prefix
As String, length As Integer) As String
    'dr = openDR("SELECT " & field & " FROM " & table & " WHERE " &
field & " REGEXP '" & prefix & "[0-9]{" & length & "}" ORDER BY " & field &
" DESC")
    dr = openDR("SELECT " & field & " FROM " & table & " WHERE LEN(" &
field & ")=" & Len(prefix) + length & " ORDER BY " & field & " DESC")
    If dr.Read Then
        Return prefix & Right(StrDup(length, "0") & Val(Right(dr(0),
length)) + 1, length)
    Else
        Return prefix & Right(StrDup(length, "0") & 1, length)
    End If
End Function

Public Sub Delete(tb As String, where As String, ParamArray
parameters() As Object)
    execute("DELETE FROM " & tb & " WHERE " & where, parameters)
End Sub

Public Function GetVar(Sql As String, ParamArray parameters() As
Object) As Object
    Dim Rows As DataTable = OpenDT(Sql, parameters)
    If Rows.Rows.Count > 0 Then
        Return Rows.Rows(0)(0)
    End If
    Return Nothing
End Function
End Module

'Please don't remove this line, you can free use and develop this module.
'2015 HerdiSoft (herdikayan@gmail.com)
'last updated: 2016-02-12

```

## 12. ModAccessExtions.vb

```

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'last updated: 2016-02-12

```

```
Imports System.Runtime.CompilerServices
```

```
Module ModAccessExtension
    '===== DATABASE =====
    <Extension(>>

```

```

Public Sub Buka(ByVal dataReader As OleDb.OleDbDataReader, ByVal sql As
String, ByVal ParamArray parameters() As String)
    MsgBox("")
    'dataReader = openDR(sql, parameters)
    'msgAsk("")
End Sub

'===== FORM =====
<Extension()>
Public Sub ShowAsChild(ByVal frm As System.Windows.Forms.Form, ByVal
parent As System.Windows.Forms.Form)
    frm.WindowState = FormWindowState.Maximized
    frm.MdiParent = parent
    frm.Show()
End Sub

'===== DataGridView =====
<Extension()>
Public Sub SelectFirst(ByVal Dgv As DataGridView)
    If Not Dgv.CurrentCell Is Nothing Then
        Dgv.CurrentCell =
Dgv.Rows(0).Cells(Dgv.CurrentCell.ColumnIndex)
    End If
End Sub

<Extension()>
Public Sub SelectNext(ByVal Dgv As DataGridView)
    If Not Dgv.CurrentCell Is Nothing And Dgv.CurrentCell.RowIndex + 1
< Dgv.Rows.Count Then
        Dgv.CurrentCell = Dgv.Rows(Dgv.CurrentCell.RowIndex +
1).Cells(Dgv.CurrentCell.ColumnIndex)
    End If
End Sub

<Extension()>
Public Sub SelectPrevious(ByVal Dgv As DataGridView)
    If Not Dgv.CurrentCell Is Nothing And Dgv.CurrentCell.RowIndex > 0
Then
        Dgv.CurrentCell = Dgv.Rows(Dgv.CurrentCell.RowIndex -
1).Cells(Dgv.CurrentCell.ColumnIndex)
    End If
End Sub

<Extension()>
Public Sub SelectLast(ByVal Dgv As DataGridView)
    If Not Dgv.CurrentCell Is Nothing Then
        Dgv.CurrentCell = Dgv.Rows(Dgv.Rows.Count -
1).Cells(Dgv.CurrentCell.ColumnIndex)
    End If
End Sub

<Extension()>
Public Sub SetDefault(ByVal Dgv As DataGridView)
    Dgv.ReadOnly = True
    Dgv.AutoSizeColumnsMode = DataGridViewAutoSizeColumnsMode.AllCells
    Dgv.RowHeadersWidthSizeMode =
DataGridViewRowHeadersWidthSizeMode.AutoSizeToDisplayedHeaders
    Dgv.AllowUserToAddRows = False
End Sub

```

```

<Extension()>
Public Sub copyTo(ByVal dgvFrom As DataGridView, ByVal dgvTo As
DataGridView)
    dgvTo.AutoGenerateColumns = dgvFrom.AutoGenerateColumns
    dgvTo.AllowUserToAddRows = dgvFrom.AllowUserToAddRows
    dgvTo.ReadOnly = dgvFrom.ReadOnly
    dgvTo.AutoSizeColumnsMode = dgvFrom.AutoSizeColumnsMode
    dgvTo.RowHeadersWidthSizeMode =
DataGridViewRowHeadersWidthSizeMode.AutoSizeToDisplayedHeaders
    dgvTo.Columns.Clear()

    For Each c As DataGridViewColumn In dgvFrom.Columns
        dgvTo.Columns.Add(c.Name, c.HeaderText)
        dgvTo.Columns(c.Name).DefaultCellStyle = c.DefaultCellStyle
        dgvTo.Columns(c.Name).ToolTipText = c.ToolTipText
    Next

    If dgvFrom.Rows.Count = 0 Then Return

    For a = 0 To dgvFrom.Rows.Count - 1
        dgvTo.Rows.Add(1)
        For b As Integer = 0 To dgvFrom.Columns.Count - 1
            dgvTo.Rows(a).Cells(b).Value =
dgvFrom.Rows(a).Cells(b).Value
        Next
        dgvTo.Rows(a).HeaderCell.Value =
dgvFrom.Rows(a).HeaderCell.Value
    Next
End Sub

<Extension()>
Public Function SumColumns(ByVal dgv As DataGridView, ByVal col As
String) As Double
    Dim total As Double = 0
    For Each row As DataGridViewRow In dgv.Rows
        If Not IsDBNull(row.Cells(col).Value) Then
            total = total + Val(row.Cells(col).Value)
        End If
    Next
    SumColumns = total
End Function

<Extension()>
Public Sub fillFromArray(ByVal dgv As DataGridView, ByVal matriks(,) As
Double, Optional ByVal row As Integer = 0, Optional ByVal col As Integer =
0)
    For a = 0 To matriks.GetUpperBound(0)
        For b As Integer = 0 To matriks.GetUpperBound(1)
            dgv.Rows(row + a).Cells(b + col).Value = matriks(a, b)
        Next
    Next
End Sub

<Extension()>
Public Function getValAt(ByVal dgv As DataGridView, ByVal row As
Integer, ByVal col As String) As Object
    getValAt = dgv.Rows(row).Cells(col).Value
End Function

<Extension()>

```

```

    Public Function getValAt(ByVal dgv As DataGridView, ByVal row As Integer, ByVal col As Integer) As Object
        getValAt = dgv.Rows(row).Cells(col).Value
    End Function

    <Extension()>
    Public Function getSelAt(ByVal dgv As DataGridView, ByVal col As Integer) As Object
        getSelAt = dgv.Rows(dgv.CurrentCell.RowIndex).Cells(col).Value
    End Function

    <Extension()>
    Public Function getSelAt(ByVal dgv As DataGridView, ByVal col As String) As Object
        getSelAt = dgv.Rows(dgv.CurrentCell.RowIndex).Cells(col).Value
    End Function

    <Extension()>
    Public Sub formatNumber(ByVal col As DataGridViewColumn, Optional Decimals As Integer = 2)
        col.DefaultCellStyle.Format = "N" & Decimals
        col.DefaultCellStyle.Alignment = DataGridViewContentAlignment.MiddleRight
    End Sub

    '==== KeyPressEventArgs ====
    <Extension()>
    Public Function isEnter(ByVal e As System.Windows.Forms.KeyPressEventArgs) As Boolean
        isEnter = (e.KeyChar = Chr(13))
    End Function

    '==== KeyEventArgs ====
    <Extension()>
    Public Function isSearch(ByVal e As System.Windows.Forms.KeyEventArgs) As Boolean
        isSearch = (e.KeyCode = Keys.F1)
    End Function

    <Extension()>
    Public Function isAdd(ByVal e As System.Windows.Forms.KeyEventArgs) As Boolean
        isAdd = (e.KeyCode = Keys.F2)
    End Function

    <Extension()>
    Public Function isSave(ByVal e As System.Windows.Forms.KeyEventArgs) As Boolean
        isSave = (e.KeyCode = Keys.F3)
    End Function

    <Extension()>
    Public Function isPay(ByVal e As System.Windows.Forms.KeyEventArgs) As Boolean
        isPay = (e.KeyCode = Keys.F4)
    End Function

    <Extension()>
    Public Function isRefresh(ByVal e As System.Windows.Forms.KeyEventArgs) As Boolean

```

```

        isRefresh = (e.KeyCode = Keys.F5)
    End Function

    <Extension()>
    Public Function isPrint(ByVal e As System.Windows.Forms.KeyEventArgs)
As Boolean
        isPrint = (e.KeyCode = Keys.F6)
    End Function

    <Extension()>
    Public Function isEdit(ByVal e As System.Windows.Forms.KeyEventArgs) As
Boolean
        isEdit = (e.KeyCode = Keys.F7)
    End Function

    <Extension()>
    Public Function isDelete(ByVal e As System.Windows.Forms.KeyEventArgs)
As Boolean
        isDelete = (e.KeyCode = Keys.F8)
    End Function

    <Extension()>
    Public Function isCancel(ByVal e As System.Windows.Forms.KeyEventArgs)
As Boolean
        isCancel = (e.KeyCode = Keys.F9)
    End Function

    <Extension()>
    Public Function isClose(ByVal e As System.Windows.Forms.KeyEventArgs)
As Boolean
        isClose = (e.KeyCode = Keys.Escape)
    End Function

    '==== DateTimePicker ====
    <Extension()>
    Public Sub Today(ByVal dtp As DateTimePicker)
        dtp.Value = Now
    End Sub

    <Extension()>
    Public Sub ThisMonth(ByVal dtp As DateTimePicker)
        dtp.Value = Now.AddDays(Now.Day * -1 + 1)
    End Sub

    '==== ComboBox ====
    <Extension()>
    Public Sub setDS(ByVal cmb As ComboBox, ByVal dt As DataTable)
        cmb.DataSource = dt
        cmb.ValueMember = dt.Columns(0).ColumnName
        If dt.Columns.Count > 1 Then cmb.DisplayMember =
dt.Columns(1).ColumnName
        If dt.Rows.Count > 0 Then cmb.SelectedIndex = 0
    End Sub

    <Extension()>
    Public Sub fillTerm(ByVal cmb As ComboBox, ByVal taxonomy As String,
Optional ByVal selected As String = "", Optional ByVal addDefault As String
= "")
        dr = openDR("SELECT term_name FROM tb_terms WHERE taxonomy='" &
taxonomy & "' ORDER BY term_name")

```



```

        cmb.fill(dr, selected, addDefault)
    End Sub

    <Extension()>
    Public Sub fill(ByVal cmb As ComboBox, ByVal dr As
OleDb.OleDbDataReader, Optional ByVal selected As String = "", Optional
ByVal addDefault As String = "")

        cmb.Items.Clear()

        If addDefault <> "" Then cmb.Items.Add(addDefault)

        While dr.Read()
            cmb.Items.Add(dr(0))
        End While

        cmb.Text = selected
    End Sub

End Module

```

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## DAFTAR RIWAYAT HIDUP



### A. Identitas Pribadi

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Alamat : Sijabut Teratai Dusun 2

### B. Riwayat Pendidikan

3. SD NEGRI 014667 DANAU SIJABUT GARDU, KABUPATEN ASAHAN  
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3. MTS PESANTREN DAARUL HIKMAH (2013-2016)
3. SMK SWASTA PPM SHADR EL ISLAM ASAHAN (2016-2019)

Demikianlah daftar riwayat hidup ini diperbuat dengan sebenarnya.

Kisaran, 29 Agustus 2023

Penulis,

**Intan Purnama Sari Situmorang**  
Nim : 19220094

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