LAMPIRAN A

KODE PROGRAM VB. NET

Proses *Top Up, Top Down,* dan *Registration*

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Private Sub Timer3_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer3.Tick
        If TextBox11.Text = "" Then
            SerialPort1.Open()
            TextBox11.Text = SerialPort1.ReadLine()
            SerialPort1.Close()
            If Mid(TextBox11.Text, 1, 7) = "balance" Then
                If TextBox7.Text = "100000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "90000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "80000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "70000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "60000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "50000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "40000" Then
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Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "30000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "20000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                ElseIf TextBox7.Text = "10000" Then
Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                    MsgBox("User is checking balance.")
                Else

                End If
            ElseIf Mid(TextBox11.Text, 1, 8) = "tu100000" Then
                If MessageBox.Show("User is requesting for tu100k",
"TOP UP", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
                    MessageBox.Show("TOP UP Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 7) = "tu50000" Then
                If MessageBox.Show("User is requesting for tu50k",
"TOP UP", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
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                    MessageBox.Show("TOP UP Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 7) = "tu20000" Then
                If MessageBox.Show("User is requesting for tu20k",
"TOP UP", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
                    MessageBox.Show("TOP UP Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 7) = "tu10000" Then
                If MessageBox.Show("User is requesting for tu10k",
"TOP UP", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
                    MessageBox.Show("TOP UP Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 8) = "td100000" Then
                If MessageBox.Show("User is requesting for td100k",
"TOP DOWN", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
                    MessageBox.Show("TOP DOWN Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 7) = "td50000" Then
                If MessageBox.Show("User is requesting for td50k",
"TOP DOWN", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
```

```
                    MessageBox.Show("TOP DOWN Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 7) = "td20000" Then
                If MessageBox.Show("User is requesting for td20k",
"TOP DOWN", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
                    MessageBox.Show("TOP DOWN Canceled")
                End If
            ElseIf Mid(TextBox11.Text, 1, 7) = "td10000" Then
                If MessageBox.Show("User is requesting for td10k",
"TOP DOWN", MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
Windows.Forms.DialogResult.Yes Then
                    Timer3.Stop()
                    Timer5.Interval = 2000
                    Timer5.Start()
                Else
                    MessageBox.Show("TOP DOWN Canceled")
                End If
            ElseIf TextBox11.Text = "restart" Then
                Timer3.Stop()
                Timer1.Interval = 2000
                Timer1.Start()
            Else
                MsgBox("TOP UP / TOP DOWN Failed!")
                Form2.ListBox1.Items.Add(Me.TextBox1.Text + "'s
request for TOP UP / TOP DOWN is failed at " +
Form2.DateTimePicker1.Text + " , " + TimeOfDay)
                SerialPort1.Open()
                SerialPort1.WriteLine("0")
                SerialPort1.Close()
                Timer3.Stop()
            End If
        Else
        End If
    End Sub
```

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Private Sub Timer5_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer5.Tick
        If TextBox13.Text = "" Then
            SerialPort1.Open()
            TextBox13.Text = SerialPort1.ReadLine()
            SerialPort1.Close()
            If Mid(TextBox13.Text, 1, 7) = "balance" Then
                If TextBox7.Text = "100000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("0")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "90000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("9")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "80000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("8")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "70000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("7")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "60000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("6")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "50000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("5")
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                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "40000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("4")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "30000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("3")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "20000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("2")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                ElseIf TextBox7.Text = "10000" Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("1")
                    SerialPort1.Close()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
checking balance...")
                Else
                End If
            ElseIf Mid(TextBox13.Text, 1, 8) = "tu100000" Then
                TextBox7.Text = Val(TextBox7.Text) + 100000
                If Val(TextBox7.Text) > 100000 Then
                    MsgBox("Top Up Failed!")
                Else
  Dim   balanceconfirmation   As   New   System.IO.StreamWriter("E:\Data
laptop\TA\Virtual Database TA\balanceconfirmation\" + TextBox1.Text +
".txt")
                    balanceconfirmation.WriteLine(TextBox7.Text)
                    balanceconfirmation.Close()
                    SerialPort1.Open()
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                    SerialPort1.WriteLine("1")
                    SerialPort1.Close()
                    Timer5.Stop()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Up for 100k balance")
                    If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                        Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
                        ListBox1.Items.Add("")
                        readinguserdata.Close()
                        ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox2.Text)
                        ListBox1.Items.Add(Me.TextBox3.Text)
                        ListBox1.Items.Add(Me.TextBox4.Text)
                        ListBox1.Items.Add(Me.TextBox5.Text)
                        ListBox1.Items.Add(Me.TextBox7.Text)
                        ListBox1.Items.Add(Me.TextBox8.Text)
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                        ListBox1.Items.Add("")
                        Dim a As Integer
                        Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        For a = 0 To ListBox1.Items.Count - 1
                      savinguserdata.WriteLine(ListBox1.Items.Item(a))
                        Next
                        savinguserdata.Close()
                        Dim d As Integer
                        d = DataGridView1.CurrentRow.Index
                        DataGridView1.Item(6, d).Value = TextBox7.Text
                        Me.Validate()
                        Me.UsersBindingSource.EndEdit()
                Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
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                MsgBox("TOP UP Success!")
                    End If
                End If
                ElseIf Mid(TextBox13.Text, 1, 7) = "tu50000" Then
                TextBox7.Text = Val(TextBox7.Text) + 50000
                If Val(TextBox7.Text) > 100000 Then
                    MsgBox("Top Up Failed!")
                Else
  Dim balanceconfirmation As New System.IO.StreamWriter("E:\Data
laptop\TA\Virtual Database TA\balanceconfirmation\" + TextBox1.Text +
".txt")
                    balanceconfirmation.WriteLine(TextBox7.Text)
                    balanceconfirmation.Close()
                    SerialPort1.Open()
                    SerialPort1.WriteLine("1")
                    SerialPort1.Close()
                    Timer5.Stop()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Up for 50k balance")
                    If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                        Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
                        ListBox1.Items.Add("")
                        readinguserdata.Close()
                        ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox2.Text)
                        ListBox1.Items.Add(Me.TextBox3.Text)
                        ListBox1.Items.Add(Me.TextBox4.Text)
                        ListBox1.Items.Add(Me.TextBox5.Text)
                        ListBox1.Items.Add(Me.TextBox7.Text)
                        ListBox1.Items.Add(Me.TextBox8.Text)
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                        ListBox1.Items.Add("")
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                    Dim a As Integer
                    Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                    For a = 0 To ListBox1.Items.Count - 1
                   savinguserdata.WriteLine(ListBox1.Items.Item(a))
                    Next
                    savinguserdata.Close()
                    Dim d As Integer
                    d = DataGridView1.CurrentRow.Index
                    DataGridView1.Item(6, d).Value = TextBox7.Text
                    Me.Validate()
                    Me.UsersBindingSource.EndEdit()
                Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
                  End If
              End If
              ElseIf Mid(TextBox13.Text, 1, 7) = "tu20000" Then
              TextBox7.Text = Val(TextBox7.Text) + 20000
              If Val(TextBox7.Text) > 100000 Then
                  MsgBox("Top Up Failed!")
              Else
  Dim balanceconfirmation As New System.IO.StreamWriter("E:\Data
laptop\TA\Virtual Database TA\balanceconfirmation\" + TextBox1.Text +
".txt")
                  balanceconfirmation.WriteLine(TextBox7.Text)
                  balanceconfirmation.Close()
                  SerialPort1.Open()
                  SerialPort1.WriteLine("1")
                  SerialPort1.Close()
                  Timer5.Stop()
                  Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Up for 20k balance")
                  If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                    Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                    ListBox1.Items.Add(readinguserdata.ReadToEnd)
                    ListBox1.Items.Add("")
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                        readinguserdata.Close()
                        ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox2.Text)
                        ListBox1.Items.Add(Me.TextBox3.Text)
                        ListBox1.Items.Add(Me.TextBox4.Text)
                        ListBox1.Items.Add(Me.TextBox5.Text)
                        ListBox1.Items.Add(Me.TextBox7.Text)
                        ListBox1.Items.Add(Me.TextBox8.Text)
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                        ListBox1.Items.Add("")
                        Dim a As Integer
                        Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        For a = 0 To ListBox1.Items.Count - 1
                      savinguserdata.WriteLine(ListBox1.Items.Item(a))
                        Next
                        savinguserdata.Close()
                        Dim d As Integer
                        d = DataGridView1.CurrentRow.Index
                        DataGridView1.Item(6, d).Value = TextBox7.Text
                        Me.Validate()
                        Me.UsersBindingSource.EndEdit()
                  Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
MsgBox("TOP UP Success!")
                    End If
                End If
                ElseIf Mid(TextBox13.Text, 1, 7) = "tu10000" Then
                TextBox7.Text = Val(TextBox7.Text) + 10000
                If Val(TextBox7.Text) > 100000 Then
                    MsgBox("Top Up Failed!")
                Else
  Dim balanceconfirmation As New System.IO.StreamWriter("E:\Data
laptop\TA\Virtual Database TA\balanceconfirmation\" + TextBox1.Text +
".txt")
                    balanceconfirmation.WriteLine(TextBox7.Text)
                    balanceconfirmation.Close()
```

```
                    SerialPort1.Open()
                    SerialPort1.WriteLine("1")
                    SerialPort1.Close()
                    Timer5.Stop()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Up for 10k balance")
                    If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                        Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
                        ListBox1.Items.Add("")
                        readinguserdata.Close()
                        ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox2.Text)
                        ListBox1.Items.Add(Me.TextBox3.Text)
                        ListBox1.Items.Add(Me.TextBox4.Text)
                        ListBox1.Items.Add(Me.TextBox5.Text)
                        ListBox1.Items.Add(Me.TextBox7.Text)
                        ListBox1.Items.Add(Me.TextBox8.Text)
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                        ListBox1.Items.Add("")
                        Dim a As Integer
                        Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        For a = 0 To ListBox1.Items.Count - 1
                       savinguserdata.WriteLine(ListBox1.Items.Item(a))
                        Next
                        savinguserdata.Close()
                        Dim d As Integer
                        d = DataGridView1.CurrentRow.Index
                        DataGridView1.Item(6, d).Value = TextBox7.Text
                        Me.Validate()
                        Me.UsersBindingSource.EndEdit()
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                    Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
MsgBox("TOP UP Success!")
                    End If
                End If
                ElseIf Mid(TextBox13.Text, 1, 8) = "td100000" Then
                TextBox7.Text = Val(TextBox7.Text) - 100000
                If Val(TextBox7.Text) < 0 Then
                    MsgBox("Top Down Failed!")
                Else
Dim cek_balance As Integer
                    If            balanceconfirmation.Text            =
DataGridView1.Item(6, cek_balance).Value Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("1")
                    SerialPort1.Close()
                    Timer5.Stop()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Down for 100k balance")
                    If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                        Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
                        ListBox1.Items.Add("")
                        readinguserdata.Close()
                        ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox2.Text)
                        ListBox1.Items.Add(Me.TextBox3.Text)
                        ListBox1.Items.Add(Me.TextBox4.Text)
                        ListBox1.Items.Add(Me.TextBox5.Text)
                        ListBox1.Items.Add(Me.TextBox7.Text)
                        ListBox1.Items.Add(Me.TextBox8.Text)
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                        ListBox1.Items.Add("")
                        Dim a As Integer
```

```
                        Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        For a = 0 To ListBox1.Items.Count - 1

savinguserdata.WriteLine(ListBox1.Items.Item(a))
                        Next
                        savinguserdata.Close()
                        Dim d As Integer
                        d = DataGridView1.CurrentRow.Index
                        DataGridView1.Item(6, d).Value = TextBox7.Text
                        Me.Validate()
                        Me.UsersBindingSource.EndEdit()

Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
MsgBox("TOP DOWN Success!")
                    End If
                     Else
                    End If
                End If
                ElseIf Mid(TextBox13.Text, 1, 7) = "td50000" Then
                TextBox7.Text = Val(TextBox7.Text) - 50000
                If Val(TextBox7.Text) < 0 Then
                    MsgBox("Top Down Failed!")
                Else
If balanceconfirmation.Text = DataGridView1.Item(6, cek_balance).Value
Then
                    SerialPort1.Open()
                    SerialPort1.WriteLine("1")
                    SerialPort1.Close()
                    Timer5.Stop()
                    Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Down for 50k balance")
                    If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                        Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
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                        ListBox1.Items.Add("")
                        readinguserdata.Close()
                        ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox1.Text)
                        ListBox1.Items.Add(Me.TextBox2.Text)
                        ListBox1.Items.Add(Me.TextBox3.Text)
                        ListBox1.Items.Add(Me.TextBox4.Text)
                        ListBox1.Items.Add(Me.TextBox5.Text)
                        ListBox1.Items.Add(Me.TextBox7.Text)
                        ListBox1.Items.Add(Me.TextBox8.Text)
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                        ListBox1.Items.Add("")
                        Dim a As Integer
                        Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        For a = 0 To ListBox1.Items.Count - 1
                      savinguserdata.WriteLine(ListBox1.Items.Item(a))
                        Next
                        savinguserdata.Close()
                        Dim d As Integer
                        d = DataGridView1.CurrentRow.Index
                        DataGridView1.Item(6, d).Value = TextBox7.Text
                        Me.Validate()
                        Me.UsersBindingSource.EndEdit()
                  Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
MsgBox("TOP DOWN Success!")
                    End If
                     Else
                    End If
                End If
                ElseIf Mid(TextBox13.Text, 1, 7) = "td20000" Then
                    TextBox7.Text = Val(TextBox7.Text) - 20000
                    If Val(TextBox7.Text) < 0 Then
                        MsgBox("Top Down Failed!")
                    Else
If balanceconfirmation.Text = DataGridView1.Item(6, cek_balance).Value
Then
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```
                        SerialPort1.Open()
                        SerialPort1.WriteLine("1")
                        SerialPort1.Close()
                        Timer5.Stop()
                        Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Down for 20k balance")
                        TextBox7.Text = Val(TextBox7.Text) - 20000
                        If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                            Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
                        ListBox1.Items.Add("")
                            readinguserdata.Close()
                            ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                            ListBox1.Items.Add(Me.TextBox1.Text)
                            ListBox1.Items.Add(Me.TextBox2.Text)
                            ListBox1.Items.Add(Me.TextBox3.Text)
                            ListBox1.Items.Add(Me.TextBox4.Text)
                            ListBox1.Items.Add(Me.TextBox5.Text)
                            ListBox1.Items.Add(Me.TextBox7.Text)
                            ListBox1.Items.Add(Me.TextBox8.Text)
                         ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                            ListBox1.Items.Add("")
                            Dim a As Integer
                            Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                            For a = 0 To ListBox1.Items.Count - 1
                       savinguserdata.WriteLine(ListBox1.Items.Item(a))
                            Next
                            savinguserdata.Close()
                            Dim d As Integer
                            d = DataGridView1.CurrentRow.Index
                            DataGridView1.Item(6, d).Value =
TextBox7.Text
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                            Me.Validate()
                            Me.UsersBindingSource.EndEdit()
                    Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
MsgBox("TOP DOWN Success!")
                        End If
                     Else
                    End If
                    End If
                ElseIf Mid(TextBox13.Text, 1, 7) = "td10000" Then
                    TextBox7.Text = Val(TextBox7.Text) - 10000
                    If Val(TextBox7.Text) < 0 Then
                        MsgBox("Top Down Failed!")
                    Else
If balanceconfirmation.Text = DataGridView1.Item(6, cek_balance).Value
Then
                        SerialPort1.Open()
                        SerialPort1.WriteLine("1")
                        SerialPort1.Close()
                        Timer5.Stop()
                        Form2.ListBox1.Items.Add(TextBox1.Text + " is
doing Top Down for 10k balance")
                        TextBox7.Text = Val(TextBox7.Text) - 10000
                        If System.IO.File.Exists("E:\Data
Laptop\TA\Virtual Database TA\" + Me.TextBox1.Text + ".txt") = True
Then
                            Dim readinguserdata As New
System.IO.StreamReader("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                        ListBox1.Items.Add(readinguserdata.ReadToEnd)
                        ListBox1.Items.Add("")
                            readinguserdata.Close()
                            ListBox1.Items.Add("ID Number " +
Me.TextBox1.Text)
                            ListBox1.Items.Add(Me.TextBox1.Text)
                            ListBox1.Items.Add(Me.TextBox2.Text)
                            ListBox1.Items.Add(Me.TextBox3.Text)
                            ListBox1.Items.Add(Me.TextBox4.Text)
                            ListBox1.Items.Add(Me.TextBox5.Text)
                            ListBox1.Items.Add(Me.TextBox7.Text)
                            ListBox1.Items.Add(Me.TextBox8.Text)
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```
                        ListBox1.Items.Add(Form2.DateTimePicker1.Text
+ ", " + TimeOfDay)
                            ListBox1.Items.Add("")
                            Dim a As Integer
                            Dim savinguserdata As New
System.IO.StreamWriter("E:\Data Laptop\TA\Virtual Database TA\" +
Me.TextBox1.Text + ".txt")
                            For a = 0 To ListBox1.Items.Count - 1
savinguserdata.WriteLine(ListBox1.Items.Item(a))
                            Next
                            savinguserdata.Close()
                            Dim d As Integer
                            d = DataGridView1.CurrentRow.Index
                            DataGridView1.Item(6, d).Value =
TextBox7.Text
                            Me.Validate()
                            Me.UsersBindingSource.EndEdit()
                    Me.TableAdapterManager1.UpdateAll(Me.TA_HanzDataSet)
                        MsgBox("TOP DOWN Success!")
                        End If
                    Else
                    End If
                    End If
                ElseIf TextBox13.Text = "restart" Then
                    Timer5.Stop()
                    Timer1.Interval = 2000
                    Timer1.Start()
                Else
                    MsgBox("TOP UP / TOP DOWN Failed!")
                    Form2.ListBox1.Items.Add(Me.TextBox1.Text + "'s
request for TOP UP / TOP DOWN is failed at " +
Form2.DateTimePicker1.Text + " , " + TimeOfDay)
                    SerialPort1.Open()
                    SerialPort1.WriteLine("0")
                    SerialPort1.Close()
                    Timer5.Stop()
                End If
            Else
                End If
    End Sub
```

LAMPIRAN B

KODE PROGRAM ARDUINO

Kode program pada arduino untuk memulai sistem pembayaran

```
#include "LCD12864RSPI.h"

#include "menu.h"

#include "greet.h"

#define AR_SIZE( a ) sizeof( a ) / sizeof( a[0] )

#define ledPin 13

#define rfid Serial1

int baris1=30;

int baris2=31;

int baris3=32;

int baris4=33;

int kolom1=34;

int kolom2=35;

int kolom3=36;

int kolom4=37;

int Str1[12];

int Str2[14];

int a = 999;

String data_kirim;

String data_terima;

//password

String password1 = "1";

String password2 = "2";

String password3 = "3";
```

```
String password4 = "4";

String password5 = "5";

String password6 = "6";

String password7 = "7";

String password8 = "8";

String password9 = "9";

String passworda = "a";

String passwordb = "b";

String passwordc = "c";

String passwordd = "d";

String password0 = "0";

void setup()

{LCDA.Initialise();

 delay(100);

//  LCDA.DisplayString(0,0,g1,16);

//  delay(300);

//  LCDA.DisplayString(1,0,g2,16);

//  delay(300);

//  LCDA.DisplayString(2,0,g3,16);

//  delay(300);

//  LCDA.DisplayString(3,0,g4,16);

//  delay(5000);

//  LCDA.CLEAR();

//  delay(100);
```

```
  LCDA.DisplayString(0,0,g7,16);
  LCDA.DisplayString(1,0,g5,16);
  LCDA.DisplayString(2,0,g6,16);
  LCDA.DisplayString(3,0,g7,16);
  Serial.begin(9600);
  rfid.begin(19200);
  pinMode(baris1,OUTPUT);
  pinMode(baris2,OUTPUT);
  pinMode(baris3,OUTPUT);
  pinMode(baris4,OUTPUT);
  pinMode(kolom1,INPUT);
  pinMode(kolom2,INPUT);
  pinMode(kolom3,INPUT);
  pinMode(kolom4,INPUT);
  pinMode(ledPin, OUTPUT);
  digitalWrite(ledPin, LOW);}
void loop()
{ if (a==21)
 { reading_topdown_confirmation();}
  else if (a==20)
  {reading_topup_confirmation();}
  else if (a==19)
  { reading_current_balance_confirmation_td();  }
  else if (a==18)
```

```
{ reading_current_balance_confirmation_tu();}

else if (a==17)

{reading_current_balance_confirmation();}

else if (a==16)

{ inserting_password_confirmation();}

else if (a==101)

{terima_konfirmasi_password(); }

else if (a==997)

{kirim_konfirmasi_password(); }

else if (a==998)

{password(); }

else if (a==100)

{terima_data_string_id();}

else if (a==999)

{rfid();}

else if (a==0)

{//setting the columns as high initially

digitalWrite(kolom1,HIGH);

digitalWrite(kolom2,HIGH);

digitalWrite(kolom3,HIGH);

digitalWrite(kolom4,HIGH);

//checking everything one by one

//case 1: col1 =0 while other col as 1

digitalWrite(baris1,LOW);
```

```
digitalWrite(baris2,HIGH);

digitalWrite(baris3,HIGH);

digitalWrite(baris4,HIGH);

//checking each column for row1 one by one

if(digitalRead(kolom1)==0)

{//Serial.println("key 1 pressed"); }

else if(digitalRead(kolom2)==0)

{//Serial.println("key 2 pressed"); }

else if(digitalRead(kolom3)==0)

{ //Serial.println("key 3 pressed"); }

else if(digitalRead(kolom4)==0)

{ LCDA.CLEAR();

 delay(50);

 LCDA.DisplayString(0,0,tu1,16);

 LCDA.DisplayString(1,0,tu2,16);

 LCDA.DisplayString(2,0,tu3,16);

 LCDA.DisplayString(3,0,tu4,16);

 a = 1;

 //Serial.println("key A pressed");  //klo yang dipilih TOP UP }

 //case 2: col2 =0 while other col as 1

digitalWrite(baris1,HIGH);

digitalWrite(baris2,LOW);

digitalWrite(baris3,HIGH);

digitalWrite(baris4,HIGH);
```

```
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ //Serial.println("key 4 pressed"); }
else if(digitalRead(kolom2)==0)
{//Serial.println("key 5 pressed");  }
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 6 pressed"); }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,td2,16);
  LCDA.DisplayString(2,0,td3,16);
  LCDA.DisplayString(3,0,td4,16);
  a = 8;
  //Serial.println("key B pressed"); }
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ //Serial.println("key 7 pressed");  }
```

```
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 8 pressed"); }
else if(digitalRead(kolom3)==0)
{   //Serial.println("key 9 pressed"); }
else if(digitalRead(kolom4)==0)
{   LCDA.CLEAR();
  delay(50);
  data_kirim = "balance";
  Serial.println(data_kirim);
  LCDA.DisplayString(0,0,b1,16);
  LCDA.DisplayString(1,0,b2,16);
  delay(100);
  a = 17;
 //Serial.println("key C pressed");  }
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ //Serial.println("key F pressed"); }
else if(digitalRead(kolom2)==0)
{  a = 999;
```

```
  data_kirim = "restart";
  Serial.println(data_kirim);
  delay(100);
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,g7,16);
  LCDA.DisplayString(1,0,g5,16);
  LCDA.DisplayString(2,0,g6,16);
  LCDA.DisplayString(3,0,g7,16);
  digitalWrite(ledPin, LOW);
  //Serial.println("key 0 pressed");  }
else if(digitalRead(kolom3)==0)
{   //Serial.println("key E pressed"); }
else if(digitalRead(kolom4)==0)
{ //Serial.println("key D pressed");  }
//giving delay between keypress
delay(50);  }
```

Proses *Scanning*

```
void read_serial()
 { mifare_request();
 get_response ();
 mifare_anticollision();
 parse ();
 print_serial();
 delay(100); }
void mifare_request()
{ rfid.write(0xAA);
 rfid.write(0xBB);
 rfid.write(0x06);
 rfid.write((uint8_t)0);
 rfid.write((uint8_t)0);
 rfid.write((uint8_t)0);
 rfid.write(0x01);
 rfid.write(0x02);
 rfid.write(0x52);
 rfid.write(0x51);
 delay (10);}
void get_response()
{ while(rfid.available())
   {for(int i=0;i<12;i++)
    {Str1[i]= rfid.read();
```

```
      delay (10); }}}

 void mifare_anticollision()

  {rfid.write(0xAA);

   rfid.write(0xBB);

   rfid.write(0x05);

   rfid.write((uint8_t)0);

   rfid.write((uint8_t)0);

   rfid.write((uint8_t)0);

   rfid.write(0x02);

   rfid.write(0x02);

   rfid.write((uint8_t)0);

   delay (10); }

void parse()

{ while(rfid.available()>0)

   { for(int i=0;i<14;i++)

     {Str2[i]= rfid.read();

      delay(10);}}}

void print_serial()

 { //print to serial port

  if (Str2[10] == 0x00 && Str2[9] == 0x00)

   { }

   else

   {Serial.println(Str2[10] + Str2[9],DEC);

   a = 100;} }
```

Proses Konfimasi *Password*

```
void password()
{ //setting the columns as high initially
 digitalWrite(kolom1,HIGH);
 digitalWrite(kolom2,HIGH);
 digitalWrite(kolom3,HIGH);
 digitalWrite(kolom4,HIGH);
 //checking everything one by one
 //case 1: col1 =0 while other col as 1
 digitalWrite(baris1,LOW);
 digitalWrite(baris2,HIGH);
 digitalWrite(baris3,HIGH);
 digitalWrite(baris4,HIGH);
 //checking each column for row1 one by one
 if(digitalRead(kolom1)==0)
 { LCDA.DisplayString(2,0,p3,16);
  data_kirim = password1;
  a = 16;
  //Serial.println("key 1 pressed"); }
 else if(digitalRead(kolom2)==0)
 {  LCDA.DisplayString(2,0,p3,16);
  data_kirim = password2;
  a = 16;
  //Serial.println("key 2 pressed"); }
```

```
else if(digitalRead(kolom3)==0)
{ LCDA.DisplayString(2,0,p3,16);
 data_kirim = password3;
 a = 16;
 //Serial.println("key 3 pressed");}
 else if(digitalRead(kolom4)==0)
{LCDA.DisplayString(2,0,p3,16);
 data_kirim = passworda;
 a = 16;
 //Serial.println("key A pressed");  //klo yang dipilih TOP UP }
//case 2: col2 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,LOW);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ LCDA.DisplayString(2,0,p3,16);
 data_kirim = password4;
 a = 16;
 //Serial.println("key 4 pressed"); }
else if(digitalRead(kolom2)==0)
{LCDA.DisplayString(2,0,p3,16);
 data_kirim = password5;
```

```
 a = 16;
 //Serial.println("key 5 pressed"); }
else if(digitalRead(kolom3)==0)
{ LCDA.DisplayString(2,0,p3,16);
 data_kirim = password6;
 a = 16;
 //Serial.println("key 6 pressed");  }
else if(digitalRead(kolom4)==0)
{ LCDA.DisplayString(2,0,p3,16);
 data_kirim = passwordb;
 a = 16;
 //Serial.println("key B pressed");  }
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ LCDA.DisplayString(2,0,p3,16);
 data_kirim = password7;
 a = 16;
 //Serial.println("key 7 pressed"); }
else if(digitalRead(kolom2)==0)
```

```
{  LCDA.DisplayString(2,0,p3,16);
  data_kirim = password8;
  a = 16;
  //Serial.println("key 8 pressed");  }
else if(digitalRead(kolom3)==0)
{ LCDA.DisplayString(2,0,p3,16);
  data_kirim = password9;
  a = 16;
  //Serial.println("key 9 pressed"); }
else if(digitalRead(kolom4)==0)
{  LCDA.DisplayString(2,0,p3,16);
  data_kirim = passwordc;
  a = 16;
  //Serial.println("key C pressed");  }
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{LCDA.CLEAR();
  a = 999;
  data_kirim = "restart";
```

```
  Serial.println(data_kirim);
  delay(100);
  LCDA.DisplayString(0,0,g7,16);
  LCDA.DisplayString(1,0,g5,16);
  LCDA.DisplayString(2,0,g6,16);
  LCDA.DisplayString(3,0,g7,16);
  //Serial.println("key F pressed");}
 else if(digitalRead(kolom2)==0)
{ LCDA.DisplayString(2,0,p3,16);
  data_kirim = password0;
  a = 16;
  //Serial.println("key 0 pressed");}
else if(digitalRead(kolom3)==0)
{LCDA.CLEAR();
  LCDA.DisplayString(1,0,p6,16);
  delay(2000);
  LCDA.DisplayString(0,0,p1,16);
  LCDA.DisplayString(1,0,p2,16);
  a = 998;
  //Serial.println("key E pressed"); }
else if(digitalRead(kolom4)==0)
{ LCDA.DisplayString(2,0,p3,16);
  data_kirim = passwordd;
  a = 16;
```

```
   //Serial.println("key D pressed");  }
  //giving delay between keypress
  delay(50);}
void inserting_password_confirmation()
{  //setting the columns as high initially
  digitalWrite(kolom1,HIGH);
  digitalWrite(kolom2,HIGH);
  digitalWrite(kolom3,HIGH);
  digitalWrite(kolom4,HIGH);
  //checking everything one by one
  //case 1: col1 =0 while other col as 1
  digitalWrite(baris1,LOW);
  digitalWrite(baris2,HIGH);
  digitalWrite(baris3,HIGH);
  digitalWrite(baris4,HIGH);
  //checking each column for row1 one by one
  if(digitalRead(kolom1)==0)
  {  //Serial.println("key 1 pressed");  }
  else if(digitalRead(kolom2)==0)
  {  //Serial.println("key 2 pressed");  }
  else if(digitalRead(kolom3)==0)
  {  //Serial.println("key 3 pressed");  }
  else if(digitalRead(kolom4)==0)
  {//Serial.println("key A pressed");  //klo yang dipilih TOP UP}
```

```
//case 2: col2 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,LOW);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ //Serial.println("key 4 pressed"); }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 5 pressed");  }
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 6 pressed");}
else if(digitalRead(kolom4)==0)
{  //Serial.println("key B pressed");}
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 7 pressed");}
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 8 pressed");}
```

```
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 9 pressed");}
else if(digitalRead(kolom4)==0)
{  //Serial.println("key C pressed");}
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ LCDA.CLEAR();
  LCDA.DisplayString(0,0,p1,16);
  LCDA.DisplayString(1,0,p2,16);
  a = 998;
  //Serial.println("key F pressed");}
else if(digitalRead(kolom2)==0)
{ //Serial.println("key 0 pressed");}
else if(digitalRead(kolom3)==0)
{ a = 997;
  //Serial.println("key E pressed");}
else if(digitalRead(kolom4)==0)
{ //Serial.println("key D pressed");}
//giving delay between keypress
```

```
 delay(50);}
void kirim_konfirmasi_password()
{Serial.println(data_kirim);
 delay(100);
 a = 101;}
void terima_konfirmasi_password()
{ if (Serial.available()>0)
 { data_terima = Serial.read() - '0';
   if (data_terima==1)
 { LCDA.CLEAR();
   delay(50);
   LCDA.DisplayString(1,0,p8,16);
   delay(2000);
   LCDA.DisplayString(0,0,m1,16);
   LCDA.DisplayString(1,0,m2,16);
   LCDA.DisplayString(2,0,m3,16);
   LCDA.DisplayString(3,0,m4,16);
   a = 0;}
   else if (data_terima==0)
   {LCDA.CLEAR();
   delay(50);
   LCDA.DisplayString(1,0,p5,16);
   delay(2000);
   LCDA.DisplayString(0,0,p1,16);
```

```
  LCDA.DisplayString(1,0,p2,16);
  a = 998;  }
  else
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,p4,16);
  delay(2000);
  LCDA.DisplayString(0,0,p7,16);
  LCDA.DisplayString(1,0,p2,16);
  a = 998;  }}}
```

Proses *Top Up, Top Down,* dan *Balance*

Top Up

Kode program berikut berada didalam void loop().

```
else if (a==1)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//checking everything one by one
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,LOW);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 1 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 2 pressed"); }
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 3 pressed");  }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
```

```
 delay(50);
 LCDA.DisplayString(1,0,c1,16);
 LCDA.DisplayString(2,0,c2,16);
 a = 2;
 //Serial.println("key A pressed");  //klo yang dipilih TOP UP}
//case 2: col2 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,LOW);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{//Serial.println("key 4 pressed"); }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 5 pressed");  }
else if(digitalRead(kolom3)==0)
{ //Serial.println("key 6 pressed");  }
else if(digitalRead(kolom4)==0)
{LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(1,0,c1,16);
 LCDA.DisplayString(2,0,c2,16);
 a = 3;
 //Serial.println("key B pressed"); }
```

```
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{   //Serial.println("key 7 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 8 pressed");  }
else if(digitalRead(kolom3)==0)
{   //Serial.println("key 9 pressed");  }
else if(digitalRead(kolom4)==0)
{LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,c1,16);
  LCDA.DisplayString(2,0,c2,16);
  a = 4;
  //Serial.println("key C pressed"); }
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
```

```
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ a = 0;
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,m1,16);
  LCDA.DisplayString(1,0,m2,16);
  LCDA.DisplayString(2,0,m3,16);
  LCDA.DisplayString(3,0,m4,16);
  //Serial.println("key F pressed");  }
else if(digitalRead(kolom2)==0)
{   a = 999;
  data_kirim = "restart";
  Serial.println(data_kirim);
  delay(100);
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,g7,16);
  LCDA.DisplayString(1,0,g5,16);
  LCDA.DisplayString(2,0,g6,16);
  LCDA.DisplayString(3,0,g7,16);
  digitalWrite(ledPin, LOW);
  //Serial.println("key 0 pressed");  }
else if(digitalRead(kolom3)==0)
```

```
{  //Serial.println("key E pressed");  }

else if(digitalRead(kolom4)==0)

{   LCDA.CLEAR();

  delay(50);

  LCDA.DisplayString(0,0,tu1,16);

  LCDA.DisplayString(1,0,tu5,16);

  LCDA.DisplayString(2,0,tu6,16);

  a = 7;

  //Serial.println("key D pressed");}

//giving delay between keypress

delay(50);   }

else if (a==2)

{  //setting the columns as high initially

digitalWrite(kolom1,HIGH);

digitalWrite(kolom2,HIGH);

digitalWrite(kolom3,HIGH);

digitalWrite(kolom4,HIGH);

//case 1: col1 =0 while other col as 1

digitalWrite(baris1,HIGH);

digitalWrite(baris2,HIGH);

digitalWrite(baris3,HIGH);

digitalWrite(baris4,LOW);

//checking each column for row1 one by one

if(digitalRead(kolom1)==0)
```

```
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,tu1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 1;
  //Serial.println("key F pressed");  }
else if(digitalRead(kolom3)==0)
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,tu10,16);
  data_kirim = "tu100000";
  Serial.println(data_kirim);
  delay(100);
  a = 20;
  //Serial.println("key E pressed"); }
//giving delay between keypress
delay(50); }
 else if (a==3)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
```

```
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(0,0,tu1,16);
 LCDA.DisplayString(1,0,tu2,16);
 LCDA.DisplayString(2,0,tu3,16);
 LCDA.DisplayString(3,0,tu4,16);
 a = 1;
 //Serial.println("key F pressed");  }
else if(digitalRead(kolom3)==0)
{  LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(1,0,tu10,16);
 data_kirim = "tu50000";
 Serial.println(data_kirim);
 delay(100);
 a = 20;
```

```
 //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50);  }
 else if (a==4)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{   LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,tu1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 1;
  //Serial.println("key F pressed");  }
```

```
else if(digitalRead(kolom3)==0)
{LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(1,0,tu10,16);
 data_kirim = "tu20000";
 Serial.println(data_kirim);
 delay(100);
 a = 20;
 //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50);  }
 else if (a==5)
{ //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
```

```
{LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,tu10,16);
  data_kirim = "tu10000";
  Serial.println(data_kirim);
  delay(100);
  a = 20;
  //Serial.println("key F pressed"); }
else if(digitalRead(kolom3)==0)
{LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,tu9,16);
  a = 0;
  delay(2000);
  LCDA.DisplayString(0,0,m1,16);
  LCDA.DisplayString(1,0,m2,16);
  LCDA.DisplayString(2,0,m3,16);
  LCDA.DisplayString(3,0,m4,16);
  //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50);  }
 else if (a==6)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
```

```
digitalWrite(kolom2,HIGH);

digitalWrite(kolom3,HIGH);

digitalWrite(kolom4,HIGH);

//case 1: col1 =0 while other col as 1

digitalWrite(baris1,HIGH);

digitalWrite(baris2,HIGH);

digitalWrite(baris3,HIGH);

digitalWrite(baris4,LOW);

//checking each column for row1 one by one

if(digitalRead(kolom1)==0)

{ LCDA.CLEAR();

 delay(50);

 LCDA.DisplayString(0,0,tu1,16);

 LCDA.DisplayString(1,0,tu2,16);

 LCDA.DisplayString(2,0,tu3,16);

 LCDA.DisplayString(3,0,tu4,16);

 a = 1;

 //Serial.println("key F pressed");  }

else if(digitalRead(kolom3)==0)

{  LCDA.CLEAR();

 delay(50);

 LCDA.DisplayString(0,0,tu1,16);

 LCDA.DisplayString(1,0,tu2,16);

 LCDA.DisplayString(2,0,tu3,16);
```

```
 LCDA.DisplayString(3,0,tu4,16);
 a = 1;
 //Serial.println("key E pressed"); }
//giving delay between keypress
delay(50);}
else if (a==7)
{ //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//checking everything one by one
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,LOW);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 1 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 2 pressed"); }
else if(digitalRead(kolom3)==0)
{ //Serial.println("key 3 pressed");  }
```

```
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,c1,16);
  LCDA.DisplayString(2,0,c2,16);
  a = 5;
  //Serial.println("key A pressed");  //klo yang dipilih TOP UP }
//case 2: col2 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,LOW);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 4 pressed"); }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 5 pressed");  }
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 6 pressed"); }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
  delay(50);
  data_kirim = "balance";
  Serial.println(data_kirim);
```

```
 LCDA.DisplayString(0,0,b1,16);
 LCDA.DisplayString(1,0,b2,16);
 delay(100);
 a = 18;
 //Serial.println("key B pressed"); }
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 7 pressed");  }
else if(digitalRead(kolom2)==0)
{ //Serial.println("key 8 pressed");  }
else if(digitalRead(kolom3)==0)
{ //Serial.println("key 9 pressed");  }
else if(digitalRead(kolom4)==0)
{ //Serial.println("key C pressed");  }
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
```

```
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ a = 0;
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,m1,16);
  LCDA.DisplayString(1,0,m2,16);
  LCDA.DisplayString(2,0,m3,16);
  LCDA.DisplayString(3,0,m4,16);
  //Serial.println("key F pressed");  }
else if(digitalRead(kolom2)==0)
{   a = 999;
  data_kirim = "restart";
  Serial.println(data_kirim);
  delay(100);
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,g7,16);
  LCDA.DisplayString(1,0,g5,16);
  LCDA.DisplayString(2,0,g6,16);
  LCDA.DisplayString(3,0,g7,16);
  digitalWrite(ledPin, LOW);
  //Serial.println("key 0 pressed"); }
else if(digitalRead(kolom3)==0)
```

```
{ //Serial.println("key E pressed"); }
else if(digitalRead(kolom4)==0)
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,tu1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 1;
  //Serial.println("key D pressed");  }
 //giving delay between keypress
 delay(50);  }
```

Setelah nilai *pointer* "a" bernilai 20, maka kode program dilanjutkan ke kode program dibawah ini.

```
void reading_topup_confirmation()
{ if (Serial.available()>0)
   {data_terima = Serial.read() - '0';
    if (data_terima == 1)
    { delay(1000);
     LCDA.DisplayString(1,0,tu9,16);
     delay(2000);
     LCDA.DisplayString(0,0,m1,16);
     LCDA.DisplayString(1,0,m2,16);
     LCDA.DisplayString(2,0,m3,16);
     LCDA.DisplayString(3,0,m4,16);
     a = 0;}
    else if (data_terima == 0)
    {delay(1000);
     LCDA.DisplayString(1,0,tu11,16);
     delay(2000);
```

```
 LCDA.DisplayString(0,0,m1,16);
 LCDA.DisplayString(1,0,m2,16);
 LCDA.DisplayString(2,0,m3,16);
 LCDA.DisplayString(3,0,m4,16);
 a = 0; }
else
{ delay(1000);
 LCDA.DisplayString(1,0,tu10,16);
 delay(2000);
 LCDA.DisplayString(0,0,m1,16);
 LCDA.DisplayString(1,0,m2,16);
 LCDA.DisplayString(2,0,m3,16);
 LCDA.DisplayString(3,0,m4,16);
 a = 0; }}}
```

Top Down

Kode program berikut berada didalam void loop().

```
 else if (a==8)

{  //setting the columns as high initially

digitalWrite(kolom1,HIGH);

digitalWrite(kolom2,HIGH);

digitalWrite(kolom3,HIGH);

digitalWrite(kolom4,HIGH);

//checking everything one by one

//case 1: col1 =0 while other col as 1

digitalWrite(baris1,LOW);

digitalWrite(baris2,HIGH);

digitalWrite(baris3,HIGH);

digitalWrite(baris4,HIGH);
```

```
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ //Serial.println("key 1 pressed");  }
else if(digitalRead(kolom2)==0)
{//Serial.println("key 2 pressed");  }
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 3 pressed"); }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,c1,16);
  LCDA.DisplayString(2,0,c2,16);
  a = 9;
  //Serial.println("key A pressed");  //klo yang dipilih TOP UP  }
//case 2: col2 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,LOW);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 4 pressed");  }
else if(digitalRead(kolom2)==0)
{   //Serial.println("key 5 pressed"); }
```

```
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 6 pressed");  }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,c1,16);
  LCDA.DisplayString(2,0,c2,16);
  a = 10;
  //Serial.println("key B pressed");  }
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ //Serial.println("key 7 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 8 pressed");  }
else if(digitalRead(kolom3)==0)
{   //Serial.println("key 9 pressed");  }
else if(digitalRead(kolom4)==0)
{ LCDA.CLEAR();
  delay(50);
```

```
  LCDA.DisplayString(1,0,c1,16);
  LCDA.DisplayString(2,0,c2,16);
  a = 11;
  //Serial.println("key C pressed");  }
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  a = 0;
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,m1,16);
  LCDA.DisplayString(1,0,m2,16);
  LCDA.DisplayString(2,0,m3,16);
  LCDA.DisplayString(3,0,m4,16);
  //Serial.println("key F pressed"); }
else if(digitalRead(kolom2)==0)
{  a = 999;
  data_kirim = "restart";
  Serial.println(data_kirim);
  delay(100);
```

```
 LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(0,0,g7,16);
 LCDA.DisplayString(1,0,g5,16);
 LCDA.DisplayString(2,0,g6,16);
 LCDA.DisplayString(3,0,g7,16);
 digitalWrite(ledPin, LOW);
 //Serial.println("key 0 pressed"); }
else if(digitalRead(kolom3)==0)
{ //Serial.println("key E pressed");  }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(0,0,td1,16);
 LCDA.DisplayString(1,0,tu5,16);
 LCDA.DisplayString(2,0,tu6,16);
 a = 14;
 //Serial.println("key D pressed"); }
//giving delay between keypress
delay(50);  }
else if (a==9)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
```

```
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 8;
  //Serial.println("key F pressed");  }
else if(digitalRead(kolom3)==0)
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,td10,16);
  data_kirim = "td100000";
  Serial.println(data_kirim);
  delay(100);
```

```
 a = 21;
 //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50);  }
 else if (a==10)
{   //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 8;
```

```
 //Serial.println("key F pressed");}
else if(digitalRead(kolom3)==0)
{   LCDA.CLEAR();
 delay(50);
 LCDA.DisplayString(1,0,td10,16);
 data_kirim = "td50000";
 Serial.println(data_kirim);
 delay(100);
 a = 21;
 //Serial.println("key E pressed"); }
//giving delay between keypress
delay(50); }
 else if (a==11)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
```

```
if(digitalRead(kolom1)==0)
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 8;
  //Serial.println("key F pressed");}
else if(digitalRead(kolom3)==0)
{LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,td10,16);
  data_kirim = "td20000";
  Serial.println(data_kirim);
  delay(100);
  a = 21;
  //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50); }
 else if (a==12)
{   //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
```

```
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{   LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 8;
  //Serial.println("key F pressed"); }
else if(digitalRead(kolom3)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,td10,16);
  data_kirim = "td10000";
  Serial.println(data_kirim);
  delay(100);
```

```
 a = 21;
 //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50); }
 else if (a==13)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{   LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 8;
```

```
  //Serial.println("key F pressed"); }
else if(digitalRead(kolom3)==0)
{ LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,td2,16);
  LCDA.DisplayString(2,0,td3,16);
  LCDA.DisplayString(3,0,td4,16);
  a = 8;
  //Serial.println("key E pressed");  }
//giving delay between keypress
delay(50); }
else if (a==14)
{  //setting the columns as high initially
digitalWrite(kolom1,HIGH);
digitalWrite(kolom2,HIGH);
digitalWrite(kolom3,HIGH);
digitalWrite(kolom4,HIGH);
//checking everything one by one
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,LOW);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
```

```
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 1 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 2 pressed");  }
else if(digitalRead(kolom3)==0)
{    //Serial.println("key 3 pressed"); }
else if(digitalRead(kolom4)==0)
{  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(1,0,c1,16);
  LCDA.DisplayString(2,0,c2,16);
  a = 12;
  //Serial.println("key A pressed");  //klo yang dipilih TOP UP  }
//case 2: col2 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,LOW);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 4 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 5 pressed");  }
```

```
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 6 pressed");  }
else if(digitalRead(kolom4)==0)
{ LCDA.CLEAR();
  delay(50);
  data_kirim = "balance";
  Serial.println(data_kirim);
  LCDA.DisplayString(0,0,b1,16);
  LCDA.DisplayString(1,0,b2,16);
  delay(100);
  a = 19;
  //Serial.println("key B pressed"); }
//case 3: col3 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,LOW);
digitalWrite(baris4,HIGH);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  //Serial.println("key 7 pressed");  }
else if(digitalRead(kolom2)==0)
{  //Serial.println("key 8 pressed"); }
else if(digitalRead(kolom3)==0)
{  //Serial.println("key 9 pressed");  }
```

```
else if(digitalRead(kolom4)==0)
{  //Serial.println("key C pressed");  }
//case 1: col1 =0 while other col as 1
digitalWrite(baris1,HIGH);
digitalWrite(baris2,HIGH);
digitalWrite(baris3,HIGH);
digitalWrite(baris4,LOW);
//checking each column for row1 one by one
if(digitalRead(kolom1)==0)
{  a = 0;
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,m1,16);
  LCDA.DisplayString(1,0,m2,16);
  LCDA.DisplayString(2,0,m3,16);
  LCDA.DisplayString(3,0,m4,16);
  //Serial.println("key F pressed");  }
else if(digitalRead(kolom2)==0)
{  a = 999;
  data_kirim = "restart";
  Serial.println(data_kirim);
  delay(100);
  LCDA.CLEAR();
  delay(50);
```

```
  LCDA.DisplayString(0,0,g7,16);
  LCDA.DisplayString(1,0,g5,16);
  LCDA.DisplayString(2,0,g6,16);
  LCDA.DisplayString(3,0,g7,16);
  digitalWrite(ledPin, LOW);
  //Serial.println("key 0 pressed");}
 else if(digitalRead(kolom3)==0)
 { //Serial.println("key E pressed");}
 else if(digitalRead(kolom4)==0)
 {LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,td1,16);
  LCDA.DisplayString(1,0,tu2,16);
  LCDA.DisplayString(2,0,tu3,16);
  LCDA.DisplayString(3,0,tu4,16);
  a = 1;
  //Serial.println("key D pressed");  }
 //giving delay between keypress
 delay(50);  }
```

Setelah nilai *pointer* "a" bernilai 21, maka kode program dilanjutkan ke kode program dibawah ini.

```
void reading_topdown_confirmation()
{  if (Serial.available()>0)
   {data_terima = Serial.read() - '0';
    if (data_terima == 1)
    {delay(1000);
```

```
 LCDA.DisplayString(1,0,td9,16);
 delay(2000);
 LCDA.DisplayString(0,0,m1,16);
 LCDA.DisplayString(1,0,m2,16);
 LCDA.DisplayString(2,0,m3,16);
 LCDA.DisplayString(3,0,m4,16);
 a = 0; }
else if (data_terima == 0)
{ delay(1000);
 LCDA.DisplayString(1,0,td11,16);
 delay(2000);
 LCDA.DisplayString(0,0,m1,16);
 LCDA.DisplayString(1,0,m2,16);
 LCDA.DisplayString(2,0,m3,16);
 LCDA.DisplayString(3,0,m4,16);
 a = 0; }
else
{delay(1000);
 LCDA.DisplayString(1,0,td10,16);
 delay(2000);
 LCDA.DisplayString(0,0,m1,16);
 LCDA.DisplayString(1,0,m2,16);
 LCDA.DisplayString(2,0,m3,16);
 LCDA.DisplayString(3,0,m4,16);
 a = 0; }}}
```

Balance

Kode program berikut berada didalam void loop().

```
else if (a==15)
 { //setting the columns as high initially
 digitalWrite(kolom1,HIGH);
 digitalWrite(kolom2,HIGH);
 digitalWrite(kolom3,HIGH);
```

```
 digitalWrite(kolom4,HIGH);
  //case 1: col1 =0 while other col as 1
 digitalWrite(baris1,HIGH);
 digitalWrite(baris2,HIGH);
 digitalWrite(baris3,HIGH);
 digitalWrite(baris4,LOW);
 //checking each column for row1 one by one
 if(digitalRead(kolom1)==0)
 {  a = 0;
   LCDA.CLEAR();
   delay(50);
   LCDA.DisplayString(0,0,m1,16);
   LCDA.DisplayString(1,0,m2,16);
   LCDA.DisplayString(2,0,m3,16);
   LCDA.DisplayString(3,0,m4,16);
   //Serial.println("key F pressed"); }
 else if(digitalRead(kolom2)==0)
 {  a = 999;
//  data_kirim = "restart";
//  Serial.println(data_kirim);
    delay(100);
    LCDA.DisplayString(0,0,g7,16);
    LCDA.DisplayString(1,0,g5,16);
    LCDA.DisplayString(2,0,g6,16);
```

```
  LCDA.DisplayString(3,0,g7,16);
  //Serial.println("key 0 pressed");  }
 else if(digitalRead(kolom3)==0)
 { a = 0;
  LCDA.CLEAR();
  delay(50);
  LCDA.DisplayString(0,0,m1,16);
  LCDA.DisplayString(1,0,m2,16);
  LCDA.DisplayString(2,0,m3,16);
  LCDA.DisplayString(3,0,m4,16);
  //Serial.println("key E pressed"); }
 else if(digitalRead(kolom4)==0)
 { //Serial.println("key D pressed");}
 //giving delay between keypress
 delay(50); }}
```

Untuk pemilihan *balance* dari berbagai tahap menu memiliki kode program yang sama, hanya berbeda dibagian kode program untuk menampilkan *text* pada LCD karena *text* tersebut mengembalikan ke posisi tampilan *menu* yang sebelumnya (menggunakan nilai *pointer* "a" yang berbeda). Contohnya ketika kita mengakses *balance* pada *menu* awal, maka setelah proses *balance* selesai, tampilan *text* di LCD menunjukkan *menu* awal, begitu pula apabila kita melakukan proses *balance* pada *menu top up* atau *top down*.

Setelah nilai *pointer* "a" bernilai 17, maka kode program dilanjutkan ke kode program berikut ini. Kode program ini untuk proses *balance* yang diakses dari *menu* utama.

```
void reading_current_balance_confirmation()
{if (Serial.available()>0)
```

```
{data_terima = Serial.read() - '0';
 if (data_terima == "0")
 { delay(100);
  LCDA.DisplayString(1,0,b3,16);
  a = 15;  }
 else if (data_terima == 9)
 { delay(100);
  LCDA.DisplayString(1,0,b4,16);
  a = 15; }
 else if (data_terima == 8)
 { delay(100);
  LCDA.DisplayString(1,0,b5,16);
  a = 15;  }
 else if (data_terima == 7)
 {  delay(100);
  LCDA.DisplayString(1,0,b6,16);
  a = 15; }
 else if (data_terima == 6)
 { delay(100);
  LCDA.DisplayString(1,0,b7,16);
  a = 15; }
 else if (data_terima == 5)
 { delay(100);
  LCDA.DisplayString(1,0,b8,16);
  a = 15; }
 else if (data_terima == 4)
 {  delay(100);
  LCDA.DisplayString(1,0,b9,16);
  a = 15; }
 else if (data_terima == 3)
 {  delay(100);
  LCDA.DisplayString(1,0,b10,16);
  a = 15; }
 else if (data_terima == 2)
 {  delay(100);
  LCDA.DisplayString(1,0,b11,16);
  a = 15; }
```

```
else if (data_terima == 1)
{  delay(100);
 LCDA.DisplayString(1,0,b12,16);
 a = 15;  }
else
{   delay(100);
 LCDA.DisplayString(1,0,b13,16);
 a = 15;}}}
```

Untuk nilai *pointer* "a" bernilai 18, maka kode program dilanjutkan ke kode program berikut ini. Kode program ini untuk proses *balance* yang diakses dari *menu top up*.

```
void reading_current_balance_confirmation_tu()
{  if (Serial.available()>0)
   {data_terima = Serial.read() - '0';
    if (data_terima == 0)
    {delay(100);
     LCDA.DisplayString(1,0,b3,16);
     a = 6;  }
    else if (data_terima == 9)
    {  delay(100);
     LCDA.DisplayString(1,0,b4,16);
     a = 6;  }
    else if (data_terima == 8)
    {  delay(100);
     LCDA.DisplayString(1,0,b5,16);
     a = 6;}
    else if (data_terima == 7)
    {delay(100);
     LCDA.DisplayString(1,0,b6,16);
     a = 6; }
    else if (data_terima == 6)
    { delay(100);
     LCDA.DisplayString(1,0,b7,16);
     a = 6;   }
    else if (data_terima == 5)
    {   delay(100);
```

```
 LCDA.DisplayString(1,0,b8,16);
 a = 6;  }
else if (data_terima == 4)
{ delay(100);
 LCDA.DisplayString(1,0,b9,16);
 a = 6; }
else if (data_terima == 3)
{  delay(100);
 LCDA.DisplayString(1,0,b10,16);
 a = 6; }
else if (data_terima == 2)
{  delay(100);
 LCDA.DisplayString(1,0,b11,16);
 a = 6; }
else if (data_terima == 1)
{  delay(100);
 LCDA.DisplayString(1,0,b12,16);
 a = 6; }
else
{ delay(100);
 LCDA.DisplayString(1,0,b13,16);
 a = 6;}}}
```

Untuk nilai *pointer* "a" bernilai 19, maka kode program dilanjutkan ke kode program berikut ini. Kode program ini untuk proses *balance* yang diakses dari *menu top down*.

```
void reading_current_balance_confirmation_td()
{if (Serial.available()>0)
   {data_terima = Serial.read() - '0';
   if (data_terima == 0)
   {   delay(100);
    LCDA.DisplayString(1,0,b3,16);
    a = 13; }
   else if (data_terima == 9)
   {  delay(100);
    LCDA.DisplayString(1,0,b4,16);
    a = 13;  }
```

```
else if (data_terima == 8)
{   delay(100);
 LCDA.DisplayString(1,0,b5,16);
 a = 13; }
else if (data_terima == 7)
{  delay(100);
 LCDA.DisplayString(1,0,b6,16);
 a = 13;  }
else if (data_terima == 6)
{  delay(100);
 LCDA.DisplayString(1,0,b7,16);
 a = 13;  }
else if (data_terima == 5)
{delay(100);
 LCDA.DisplayString(1,0,b8,16);
 a = 13;  }
else if (data_terima == 4)
{delay(100);
 LCDA.DisplayString(1,0,b9,16);
 a = 13; }
else if (data_terima == 3)
{  delay(100);
 LCDA.DisplayString(1,0,b10,16);
 a = 13  ; }
else if (data_terima == 2)
{delay(100);
 LCDA.DisplayString(1,0,b11,16);
 a = 13;}
else if (data_terima == 1)
{ delay(100);
 LCDA.DisplayString(1,0,b12,16);
 a = 13; }
else
{ delay(100);
 LCDA.DisplayString(1,0,b13,16);
 a = 13; }}}
```

LAMPIRAN C

STRUKTUR ISO 8583

Struktur Iso 8583 memiliki 3 bagian, yaitu:

1. Pesan, elemen data dan nilai-nilai/isi dari kode.
2. Aplikasi dan prosedur pendaftaran *Institution Identification Code* (IIC).
3. Pemeliharaan prosedur untuk pesan, elemen data dan nilai kode.

***Message type indicator* (MTI)**

Contoh MTI 0110 setiap digit angkanya memiliki arti demikian :

0xxx -> *version of* ISO 8583 (1987 *version*)

x1xx -> *class of the Message (Authorization Message)*

xx1x -> *function of the Message (Request Response)*

xxx0 -> *who began the communication (Acquirer)*

Versi ISO 8583

Posisi pertama MTI menentukan versi standar ISO 8583 yang digunakan untuk mengirimkan pesan.

Tabel Posisi pertama MTI

Position	Meaning
0xxx	ISO 8583-1:1987 version
1xxx	ISO 8583-2:1993 version
2xxx	ISO 8583-1:2003 version
3xxx	Reserved for ISO use
4xxx	Reserved for ISO use
5xxx	Reserved for ISO use
6xxx	Reserved for ISO use
7xxx	Reserved for ISO use
8xxx	Reserved for National use
9xxx	Reserved for Private use

Message Class

Posisi kedua MTI menentukan tujuan keseluruhan pesan.

Tabel Posisi kedua MTI

Position	Meaning	Usage
x1xx	Authorization Message	Determine if funds are available, get an approval but do not post to account for reconciliation, Dual Message System (DMS), awaits file exchange for posting to account
x2xx	Financial Message	Determine if funds are available, get an approval and post directly to the account, Single Message System (SMS), no file exchange after this
x3xx	File Actions Message	Used for hot-card, TMS and other exchanges
x4xx	Reversal Message	Reverses the action of a previous authorization
x5xx	Reconciliation Message	Transmits settlement information message
x6xx	Administrative Message	Transmits administrative advice. Often used for failure messages (e.g. message reject or failure to apply)
x7xx	Fee Collection Messages	
x8xx	Network Management Message	Used for secure key exchange, logon, echo test and other network functions
x9xx	Reserved by ISO	

Message Function

Posisi tiga dari MTI menentukan fungsi pesan yang mendefinisikan bagaimana pesan harus mengalir dalam sistem. Permintaan adalah *end-to-end* pesan (misalnya, dari perusahaan pengakuisisi kepada penerbit dan kembali dengan timeout dan pembalikan otomatis di tempat), sedangkan nasehat adalah *point-to-point* pesan (misalnya, dari terminal ke pengakuisisi, dari perusahaan

pengakuisisi ke jaringan, dari jaringan kepada penerbit, dengan transmisi dijamin melalui setiap link, tetapi tidak harus segera).

Tabel Posisi tiga dari MTI

Position	Meaning
xx0x	Request
xx1x	Request Response
xx2x	Advice
xx3x	Advice Response
xx4x	Notification
xx8x	Response acknowledgment
xx9x	Negative acknowledgment

Message Origin

Posisi empat dari MTI mendefinisikan lokasi dari sumber pesan dalam rantai pembayaran.

Tabel Posisi empat dari MTI

Position	Meaning
xxx0	Acquirer
xxx1	Acquirer Repeat
xxx2	Issuer
xxx3	Issuer Repeat
xxx4	Other
xxx5	Other Repeat

Untuk penjelasan lebih lengkap mengenai ISO 8583 dapat dilihat pada link wikipedia yang ada di bagian referensi. [4]

LAMPIRAN D

DATABASE FORMAT

Tabel Format *Database*

Data	Format pada MS SQL Server	Format pada VDb
Fullname	*String*	*String*
Address	*String*	*String*
Phone Number	*String*	*String*
Username	*String*	*String*
Password	*String*	*String*
ID	*Int*	*String*
Balance	*Int*	*String*
Email	*String*	*String*

Data disimpan di dua tempat, yang pertama menggunakan MS SQL Server, dan yang kedua menggunakan *Virtual Database* (VDb). Berikut adalah tabel wewenang untuk mengakses *database*.

Tabel Wewenang Pengaksesan *Database*

Status	MS SQL Server	VDb
User	*Transaction only (top up/ down, balance check)*	*Transaction only (top up/ down, balance check)*
Operator	*Update data (Except balance) & Saving data*	*Update data (Except balance) & Saving data*
Administrator	*Unlimited Access*	*Unlimited Access*

Tabel Pengertian wewenang pengaksesan

Authority	***Description***
Transaction Only	User hanya bisa mengakses *database* melalui transaksi yang dilakukan pada arduino.
Update Data	Operator dapat mengubah semua isi data dalam *database,* kecuali jumlah *balance* suatu *user account.*
Saving Data	Operator dapat menyimpan suatu *user data* yang baru terdaftar melalui proses registrasi ke dalam *database*.
Unlimited Access	*Administrator* dapat melakukan akses apapun terhadap *database.*