**FRMMAIN.VB**

Public Class frmMain

'------------------------------------------------------------

'- File Name : frmMain.vb -

'- Part of Project: Calculator\_Dang -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- File Purpose: -

'- -

'- This file contains the window that allows user to open multipe

'MDI children inside itself. It can control and arrange its children

'------------------------------------------------------------

'- Program Purpose: -

'- -

'- The purpose of this program is to build an MDI calculator application.-

'- main form should have a main menu with the following options: File, Window and Help.

'- The Window Option should serve As a Windowlist And have the Tile And Cascade options available under it

'- .Help should have an About Option that activates an about box dialog. File should have submenu

'- Option Onchoices Of New And Exit. New will instantiate a New child calculator form And Exit

'------------------------------------------------------------

Private Sub AboutToolStripMenuItem\_Click(sender As Object, e As EventArgs) Handles AboutToolStripMenuItem.Click

'------------------------------------------------------------

'- Subprogram Name: AboutToolStripMenuItem\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine show the aboutBox information about this program

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- (None) -

'------------------------------------------------------------

AboutBox.ShowDialog()

End Sub

Public Sub mnuFileNew\_Click(sender As Object, e As EventArgs) Handles mnuFileNew.Click

'------------------------------------------------------------

'- Subprogram Name: mnuFileNew\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- This subroutine create a new child form which is the calculator form

'- which then later show in the main form

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- aNewChildform - child calculator form -

'------------------------------------------------------------

Dim aNewChildform As frmChildren = New frmChildren()

aNewChildform.MdiParent = Me

aNewChildform.Show()

End Sub

Private Sub ToolStripMenuItem\_Click(sender As Object, e As EventArgs) Handles mnuWindowCascade.Click, mnuWindowTileVertical.Click, mnuWindowTileHorizontal.Click

'------------------------------------------------------------

'- Subprogram Name: ToolStripMenuItem\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- This subroutine create a change in different tile form

'- including cascade, horizontal, and vertical. Managing 3 different click events

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- mnuItem - look at tool strip items -

'------------------------------------------------------------

Dim mnuItem As ToolStripMenuItem = CType(sender, ToolStripMenuItem)

If mnuItem.Text.Contains("Cascade") Then

LayoutMdi(MdiLayout.Cascade) 'make layout cascade

ElseIf mnuItem.Text.Contains("Vertical") Then

LayoutMdi(MdiLayout.TileVertical) 'make layout vertical

Else

LayoutMdi(MdiLayout.TileHorizontal) 'make layout horizontal

End If

End Sub

Private Sub mnuFileExit\_Click(sender As Object, e As EventArgs) Handles mnuFileExit.Click

'------------------------------------------------------------

'- Subprogram Name: mnuFileExit\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine call form closing event

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- (None) -

'------------------------------------------------------------

Close()

End Sub

End Class

**FRMCHILDREN.VB**

Imports System.ComponentModel

Public Class frmChildren

'------------------------------------------------------------

'- File Name : frmMain.vb -

'- Part of Project: Calculator\_Dang -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

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'------------------------------------------------------------

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'---------------------------------------------------------------------------------------

Dim txtRecentSelected As TextBox

'------------------------------------------------------------

'- Global Variable Dictionary (alphabetically) FROM GLOBAL VAR MODULE:

'-txtRecentSelected - global textbox to check what is the last selected textbox

'---------------------------------------------------------------------

Private Sub txtFieldFocus(sender As Object, e As EventArgs) Handles txtBin1.GotFocus, txtBin2.GotFocus, txtDec1.GotFocus, txtDec2.GotFocus, txtHex1.GotFocus, txtHex2.GotFocus

'------------------------------------------------------------

'- Subprogram Name: txtFieldFocus -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine process everytime the user focus in the textbox

'- whenever txtBox have bin, dec, or hex, it will call an approriate function

'- according to the txtbox

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- txtBox - the selected textbox -

'------------------------------------------------------------

Dim txtBox As TextBox = CType(sender, TextBox)

txtRecentSelected = txtBox

'when has "bin" in name call binarySetting sub

If txtBox.Name.Contains("Bin") Then

BinarySetting()

'when has "dec" in name call DecimalSetting sub

ElseIf txtBox.Name.Contains("Dec") Then

DecimalSetting()

'else call HexSetting sub

Else

HexSetting()

End If

End Sub

Sub BinarySetting()

'------------------------------------------------------------

'- Subprogram Name: BinarySetting -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine disable all the buttons excpt button 0 and 1

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- txtBox - the selected textbox -

'------------------------------------------------------------

Dim arrDisButton As Button() = {btn2, btn3, btn4, btn5, btn6, btn7, btn8, btn9, btnA, btnB, btnC, btnD, btnE, btnF}

For Each button In arrDisButton

button.Enabled = False

Next

End Sub

Sub DecimalSetting()

'------------------------------------------------------------

'- Subprogram Name: DecimalSetting -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine disable all the buttons excpt all the number button

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- txtBox - the selected textbox -

'------------------------------------------------------------

'this loop disable all the buttons from A to F

Dim arrDisButton As Button() = {btnA, btnB, btnC, btnD, btnE, btnF}

For Each button In arrDisButton

button.Enabled = False

Next

'this loop enable all the buttons from 0 to 9

Dim arrEnButton As Button() = {btn0, btn1, btn2, btn3, btn4, btn5, btn6, btn7, btn8, btn9}

For Each button In arrEnButton

button.Enabled = True

Next

End Sub

Sub HexSetting()

'------------------------------------------------------------

'- Subprogram Name: HexSetting -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine enable all the buttons

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- txtBox - the selected textbox -

'------------------------------------------------------------

'for loop enable all the buttons

Dim arrEnButton As Button() = {btn0, btn1, btn2, btn3, btn4, btn5, btn6, btn7, btn8, btn9, btnA, btnB, btnC, btnD, btnE, btnF}

For Each button In arrEnButton

button.Enabled = True

Next

End Sub

Private Sub btn2toF\_Click(sender As Object, e As EventArgs) Handles btnA.Click, btnB.Click, btnC.Click, btnD.Click, btnE.Click, btnF.Click, btn2.Click, btn3.Click, btn4.Click, btn5.Click, btn6.Click, btn7.Click, btn8.Click, btn9.Click

'------------------------------------------------------------

'- Subprogram Name: btn2toF\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine erase the textboxes that contains only 0

'-then appends the approriate letter and number using FillTExtBox Function

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- btnText - the selected button -

'------------------------------------------------------------

Dim btnText = CType(sender, Button)

If txtRecentSelected.Text.Equals("0") Then

txtRecentSelected.Text = ""

End If

FillTextbox(btnText.Text)

End Sub

Private Sub btn0n1\_Click(sender As Object, e As EventArgs) Handles btn0.Click, btn1.Click

'------------------------------------------------------------

'- Subprogram Name: btn0n1\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine the approriate number 0 or 1 button using FillTExtBox Function

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- btnText - the selected button -

'------------------------------------------------------------

Dim btnText = CType(sender, Button)

FillTextbox(btnText.Text)

End Sub

Sub FillTextbox(strVal As String)

'------------------------------------------------------------

'- Subprogram Name: FillTextbox -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine add the text to the approriate textbox field

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'------------------------------------------------------------

Dim value As String = txtRecentSelected.Text

value += strVal

txtRecentSelected.Text = value

End Sub

Private Sub btnConvert\_Click(sender As Object, e As EventArgs) Handles btnConvert.Click

'------------------------------------------------------------

'- Subprogram Name: btnConvert\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine convert number from the most recent textbox

'- to approriate binary, hex or decimal value

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'-charBinary() - return a binary char array that have all the binary value from start to end

'-intDecimal - returmn a decimal form

'------------------------------------------------------------

'if the textbox selected is decimal then check if its value 1 or 2

'then call the function DectoBin function passing in the decimal vale to get the binary

'call buildin hex function to get the hex value

If txtRecentSelected.Name.Contains("Dec") Then

If txtRecentSelected.Name.Contains("1") Then

Try

txtBin1.Text = DectoBin(CInt(txtRecentSelected.Text))

txtHex1.Text = Hex(CInt(txtRecentSelected.Text))

Catch

txtDec1.Text = "Cannot Handle"

End Try

Else

Try

txtBin2.Text = DectoBin(CInt(txtRecentSelected.Text))

txtHex2.Text = Hex(CInt(txtRecentSelected.Text))

Catch

txtDec2.Text = "Cannot Handle"

End Try

End If

'if the textbox selected is binary check if its value 1 or 2

'then call the function BintoDec function passing in the binary char array to get the decimal

'call buildin hex function to get the hex value. also recall the decimal to binary function to get a full 32 bits binary

ElseIf txtRecentSelected.Name.Contains("Bin") Then

Dim intDecimal = 0

Dim charBinary() As Char = txtRecentSelected.Text.Replace(" ", "").ToCharArray

intDecimal = BintoDec(charBinary)

If intDecimal = -1 Then

txtRecentSelected.Text = "Cannot Handle this Number"

Else

If txtRecentSelected.Name.Contains("1") Then

txtBin1.Text = DectoBin(intDecimal)

txtDec1.Text = intDecimal.ToString

txtHex1.Text = Hex(intDecimal)

Else

txtBin2.Text = DectoBin(intDecimal)

txtDec2.Text = intDecimal.ToString

txtHex2.Text = Hex(intDecimal)

End If

End If

'if the textbox selected is binary check if its value 1 or 2

'then call the function BintoDec function passing in the binary char array to get the decimal

'call buildin hex function to get the hex value. also recall the decimal to binary function to get a full 32 bits binary

Else

Try

Dim intDecimal As Integer = CInt(Convert.ToInt64(txtRecentSelected.Text, 16))

If txtRecentSelected.Name.Contains("1") Then

txtBin1.Text = DectoBin(intDecimal)

txtDec1.Text = intDecimal.ToString

Else

txtBin2.Text = DectoBin(intDecimal)

txtDec2.Text = intDecimal.ToString

End If

Catch

If txtRecentSelected.Name.Contains("1") Then

txtHex1.Text = "Cannot Handle this Number"

Else

txtHex2.Text = "Cannot Handle this Number"

End If

End Try

End If

End Sub

Function DectoBin(dec As Integer) As String

'------------------------------------------------------------

'- Function Name: DectoBin -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- This function convert number from decimal to binary that return a binary number from

'- decimal number

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- strBinary - binary string that represent 32 bit 0 and 1

'- intSeperate - keep track of the binary bit make sure there are a space in every 4 bit

'------------------------------------------------------------

Dim strBinary As String = ""

Dim intSeperate As Integer = 1

For i As Integer = 31 To 0 Step -1

'Compare the decimal value we're trying to convert with

'a power of 2 value – if we And them And get a True value

'back, that means that that power's bit is on, e.g. a 1...

Dim bool As Long = dec And CLng(Math.Pow(2, i))

If CBool(dec And CLng(Math.Pow(2, i))) = True Then

If intSeperate = 4 Then

strBinary = strBinary & "1" & " "

intSeperate = 0

Else

strBinary = strBinary & "1"

intSeperate = intSeperate + 1

End If

Else

'...otherwise we need to set that power at 0

If intSeperate = 4 Then

strBinary = strBinary & "0" & " "

intSeperate = 1

Else

strBinary = strBinary & "0"

intSeperate = intSeperate + 1

End If

End If

Next

Return strBinary

End Function

Function BintoDec(bin() As Char) As Integer

'------------------------------------------------------------

'- Function Name: BintoDec -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- This function convert number from binary to (positive) decimal

'- by using a loop run through every digit of 1 and 0 bit

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- intDec - integer represent a decimal value

'- intPow - keep track of the power of 2

'------------------------------------------------------------

Dim intDec As Integer = 0

Dim intPow As Integer = 0

For i As Integer = bin.Length - 1 To 0 Step -1

If bin(i) = "1"c Then

Try

intDec = intDec + CInt(Math.Pow(2, intPow))

Catch

Return -1

End Try

End If

intPow = intPow + 1

Next

Return intDec

End Function

Private Sub btnClear\_Click(sender As Object, e As EventArgs) Handles btnClear1.Click, btnClear2.Click, btnClearRes.Click

'------------------------------------------------------------

'- Subprogram Name: btnClear\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine clear all the value for value1, value2, and the result value

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- btnSelected - a copy of the selected button

'------------------------------------------------------------

Dim btnSelected As Button = CType(sender, Button)

'if the button contain 1, 2, or result, then clear all the textfield accordingly

If btnSelected.Name.Contains("1") Then

txtDec1.Text = "0"

txtBin1.Text = "0"

txtHex1.Text = "0"

ElseIf btnSelected.Name.Contains("2") Then

txtDec2.Text = "0"

txtBin2.Text = "0"

txtHex2.Text = "0"

Else

txtDecRes.Text = "0"

txtBinRes.Text = "0"

txtHexRes.Text = "0"

End If

End Sub

Private Sub btnAnd\_Click(sender As Object, e As EventArgs) Handles btnAnd.Click

'------------------------------------------------------------

'- Subprogram Name: btnAnd\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine 'and' the value1 and value2 together then printed it to the result textfield

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- intDecimal - result that 2 value anded together

'------------------------------------------------------------

Dim intDecimal As Integer = CInt(CLng(txtDec1.Text) And CLng(txtDec2.Text))

txtDecRes.Text = intDecimal.ToString

txtBinRes.Text = DectoBin(intDecimal)

txtHexRes.Text = Hex(intDecimal)

End Sub

Private Sub btnOr\_Click(sender As Object, e As EventArgs) Handles btnOr.Click

'------------------------------------------------------------

'- Subprogram Name: btnOr\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine 'or' the value1 and value2 together then printed it to the result textfield

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- intDecimal - result that 2 value or together

'------------------------------------------------------------

Dim intDecimal As Integer = CInt(CLng(txtDec1.Text) Or CLng(txtDec2.Text))

txtDecRes.Text = intDecimal.ToString

txtBinRes.Text = DectoBin(intDecimal)

txtHexRes.Text = Hex(intDecimal)

End Sub

Private Sub btnXor\_Click(sender As Object, e As EventArgs) Handles btnXor.Click

'------------------------------------------------------------

'- Subprogram Name: btnXor\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine 'xor' the value1 and value2 together then printed it to the result textfield

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- intDecimal - result that 2 value xor together

'------------------------------------------------------------

Dim intDecimal As Integer = CInt(CLng(txtDec1.Text) Xor CLng(txtDec2.Text))

txtDecRes.Text = intDecimal.ToString

txtBinRes.Text = DectoBin(intDecimal)

txtHexRes.Text = Hex(intDecimal)

End Sub

Private Sub btnNot1\_Click(sender As Object, e As EventArgs) Handles btnNot1.Click

'------------------------------------------------------------

'- Subprogram Name: btnXor\_Click -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine 'not' the value1 and value2 together then printed it to the result textfield

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically):

'- intDecimal - result that 2 value xor together

'------------------------------------------------------------

Dim intDecimal As Integer = CInt(Not CLng(txtDec1.Text))

txtDecRes.Text = intDecimal.ToString

txtBinRes.Text = DectoBin(intDecimal)

txtHexRes.Text = Hex(intDecimal)

End Sub

Private Sub frmChildren\_Closing(sender As Object, e As CancelEventArgs) Handles Me.Closing

'------------------------------------------------------------

'- Subprogram Name: frmMain\_Closing -

'------------------------------------------------------------

'- Written By: Binh Dang -

'- Written On: March 18, 2022 -

'------------------------------------------------------------

'- Subprogram Purpose: -

'- -

'- This subroutine check and see if there are any value in the value1 and value2

'-if yes then hide the children form

'------------------------------------------------------------

'------------------------------------------------------------

'- Local Variable Dictionary (alphabetically): -

'- (None) -

'------------------------------------------------------------

If txtDec1.Text <> "0" Or txtDec2.Text <> "0" Or txtBin1.Text <> "0" Or txtBin2.Text <> "0" Or txtHex1.Text <> "0" Or txtHex2.Text <> "0" Then

If MessageBox.Show("Are you sure you want to quit? Dirty Calculator", "Programmer's Calculator", MessageBoxButtons.YesNo) = DialogResult.No Then

e.Cancel = True

Else

e.Cancel = False

Hide()

End If

End If

End Sub

End Class