' Project: TicTacToe / FinalProject

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' Purpose: Lets you play Tic tac toe with a friend

Option Strict On

Public Class frmTicTacToe

' Array of box labels (row, column)

Private lblArray(2, 2) As Label

' Player Turn

Private intTurn As Integer

Private boolGameWon As Boolean = False

Private boolCatsGame As Boolean = False

Private boolAgainstComputer As Boolean = False

' This is the button a player clicks to do their turn

' Checks input for player, does computer turn if one player

' Checks whether game has finished and displays game finished message

Private Sub btnSubmit\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles btnSubmit.Click

Dim strRow As String

Dim strCol As String

Dim bytRow As Byte

Dim bytCol As Byte

strRow = mskRow.Text

strCol = mskCol.Text

' Check for a numeric value

If IsNumeric(strRow) AndAlso IsNumeric(strCol) Then

' row/column conversion

bytRow = Convert.ToByte(strRow)

bytCol = Convert.ToByte(strCol)

' Check for a valid number

If bytRow >= 1 And bytRow <= 3 And bytCol >= 1 And bytCol <= 3 Then

'Check if the spot is empty

If lblArray(bytRow - 1, bytCol - 1).Text = "" Then

'Set the label to the appropriate text

If intTurn = 1 Then

lblArray(bytRow - 1, bytCol - 1).Text = "X"

Else

lblArray(bytRow - 1, bytCol - 1).Text = "O"

End If

' Check whether the game has won

boolGameWon = checkIfGameWon()

' Play the computer if AI is on and check whether they won

If boolAgainstComputer And Not boolGameWon Then

computerAITurn()

boolGameWon = checkIfGameWon()

If boolGameWon Then

intTurn = 2

End If

End If

' Check whether the game has tied

boolCatsGame = boxesFilled()

' If the game hasn't won

If Not boolGameWon And Not boolCatsGame Then

' Change the player

If intTurn = 1 Then

intTurn = 2

If boolAgainstComputer Then

intTurn = 1

End If

Else

intTurn = 1

End If

' Set appropriate player label

lblPlayer.Text = "Player " & intTurn & "'s" & ControlChars.NewLine & "Turn"

mskRow.Focus()

Else

' Else set win/tie screen

btnSubmit.Enabled = False

If boolCatsGame And Not boolGameWon Then

lblPlayer.Text = "Cat's" & ControlChars.NewLine & "Game"

Else

lblPlayer.Text = "Player " & intTurn & ControlChars.NewLine & "WINS!"

End If

mskRow.Enabled = False

mskCol.Enabled = False

End If

Else

MsgBox("Enter a value into a blank spot")

End If

Else

MsgBox("Enter numbers between 1 and 3 please", , "Input Error")

End If

Else

MsgBox("Invalid row or column entry", , "Input Error")

End If

mskRow.Focus()

If Not boolGameWon Then

mskRow.Clear()

mskCol.Clear()

End If

End Sub

' This checks for a filled array by setting a bool to true and then

' Setting it to false if any spots are blank

Private Function boxesFilled() As Boolean

Dim boolBoxesFilled As Boolean = True

For Each lbl In lblArray

If lbl.Text = "" Then

boolBoxesFilled = False

Exit For

End If

Next

If boolBoxesFilled Then

Return True

End If

Return False

End Function

' Starts a new game by clearing and reseting everything

Private Sub btnNewGame\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles btnNewGame.Click

For Each lblBox In lblArray

lblBox.Text = ""

Next

intTurn = 1

lblPlayer.Text = "Player 1's" & ControlChars.NewLine & "Turn"

boolGameWon = False

boolCatsGame = False

btnSubmit.Enabled = True

mskRow.Clear()

mskCol.Clear()

mskRow.Enabled = True

mskCol.Enabled = True

mskRow.Focus()

End Sub

' The computer plays, changing a label to "O" if any are available

Private Sub computerAITurn()

If Not boxesFilled() Then

' Create an array of the blank labels

Dim lblBlankArray(9) As Label

Dim intArraySize As Integer = 0

For Each lbl In lblArray

If lbl.Text = "" Then

lblBlankArray(intArraySize) = lbl

intArraySize += 1

End If

Next

' Select a random value in the blank labels array and change its text

Randomize()

Dim intSelectedLabelIndex As Integer = CInt(Int(intArraySize \* Rnd()))

lblBlankArray(intSelectedLabelIndex).Text = "O"

End If

End Sub

' Initializes lblArray and starts a new game

Private Sub frmTicTacToe\_Load(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles MyBase.Load

' Initialize lblArray

lblArray(0, 0) = lblTopLeft

lblArray(0, 1) = lblTopCenter

lblArray(0, 2) = lblTopRight

lblArray(1, 0) = lblMiddleLeft

lblArray(1, 1) = lblMiddleCenter

lblArray(1, 2) = lblMiddleRight

lblArray(2, 0) = lblBottomLeft

lblArray(2, 1) = lblBottomCenter

lblArray(2, 2) = lblBottomRight

' Start a new game

btnNewGame\_Click(sender, e)

End Sub

' Determines whether a player has won the game

' By looking at the values of the lblArray

Private Function checkIfGameWon() As Boolean

For intPosition = 0 To 2

'Check vertical bar

Dim strTopOfBar As String = lblArray(0, intPosition).Text

If strTopOfBar <> "" AndAlso strTopOfBar = lblArray(1, intPosition).Text AndAlso strTopOfBar = lblArray(2, intPosition).Text Then

Return True

End If

'Check horizontal bar

Dim strLeftOfBar As String = lblArray(intPosition, 0).Text

If strLeftOfBar <> "" AndAlso strLeftOfBar = lblArray(intPosition, 1).Text AndAlso strLeftOfBar = lblArray(intPosition, 2).Text Then

Return True

End If

Next

'If the center isn't blank

Dim strCenter As String = lblArray(1, 1).Text

If strCenter <> "" Then

'Check major diagonal

If strCenter = lblArray(0, 0).Text AndAlso strCenter = lblArray(2, 2).Text Then

Return True

End If

'Check minor diagonal

If strCenter = lblArray(2, 0).Text AndAlso strCenter = lblArray(0, 2).Text Then

Return True

End If

End If

Return False

End Function

'New game button from the menu strip

Private Sub mnuNewGame\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles mnuNewGame.Click

btnNewGame\_Click(sender, e)

End Sub

'Submit button from the menu strip

Private Sub mnuSubmit\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles mnuSubmit.Click

btnSubmit\_Click(sender, e)

End Sub

' Displays information about the program and the game

Private Sub mnuAbout\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles mnuAbout.Click

MsgBox("Developed by Raphael Rouvinov" & ControlChars.NewLine & \_

"Mr.Hoster's 4th Period, 4th term, 2013 at Mundelein High School" & ControlChars.NewLine & ControlChars.NewLine & \_

"Tic tac toe is played with two people or against a computer

." & ControlChars.NewLine & \_

"The first player is ""X"" and the second player ""O""" & ControlChars.NewLine & \_

"Each player takes turns putting their mark on the board" & ControlChars.NewLine & \_

"Until one player gets 3 in a row diagonally, vertically, or horizontally" & ControlChars.NewLine & \_

"Or all the spaces are filled.", , "About")

End Sub

' Lets player select a game mode: play against a computer or a person

Private Sub mnuGameMode\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles mnuGameMode.Click

Dim strPlayerCount As String

Dim intPlayerCount As Integer

strPlayerCount = InputBox("Enter 1 to play against the computer and 2 to play with two people", "Player Count", "2")

' Check input

If IsNumeric(strPlayerCount) Then

intPlayerCount = Convert.ToInt32(strPlayerCount)

Dim boolCheckIfChanged As Boolean = boolAgainstComputer

' Change game mode and start new game if valid input and mode changed

If intPlayerCount = 1 Then

boolAgainstComputer = True

ElseIf intPlayerCount = 2 Then

boolAgainstComputer = False

Else

MsgBox("Enter 1 or 2", , "Input Error")

End If

If boolAgainstComputer <> boolCheckIfChanged Then

btnNewGame\_Click(sender, e)

End If

Else

MsgBox("Enter 1 or 2", , "Input Error")

End If

End Sub

' Close the application

Private Sub mnuExit\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles mnuExit.Click

Close()

End Sub

End Class

