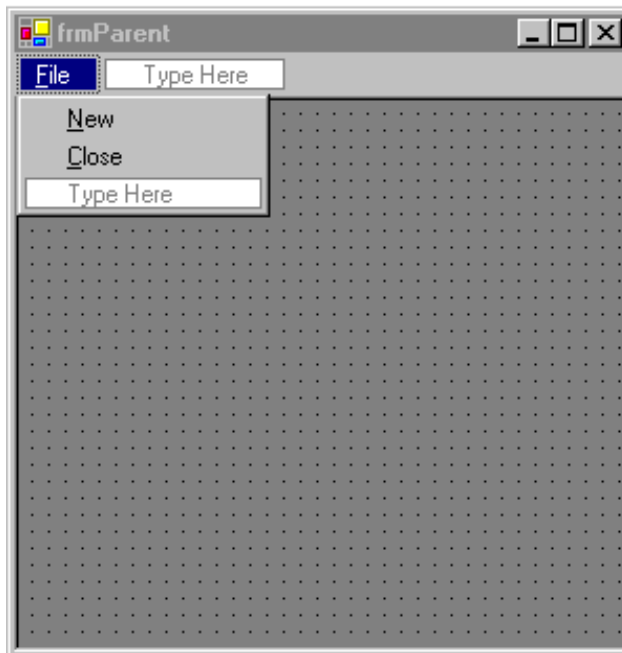**Name:**   **Session:**
**Programming II**
Lab Exercise 4/15/2025

Creating an MDI Web Browser

In this project you will create an MDI (Multiple Document Interface) Web Browser. In this project you will have two forms: frmParent and frmChild. A single parent window may have any number of child windows. The frmParent should look like this:

The only control that frmParent has is a MainMenu control. Be sure to change the isMdiContainer property for this form to True.

Add a second form to your solutions named frmChild that looks like this:
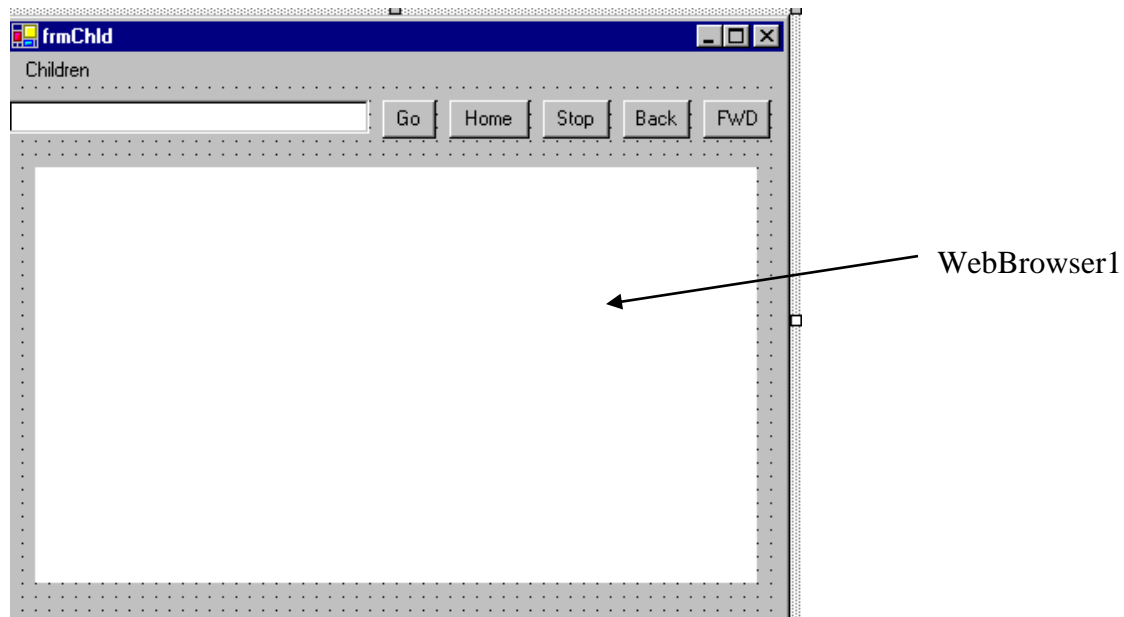
On the frmParent menu item mnuNew_Click add the following code:

```
frmChild  child = new frmChild();
child.MdiParent = this;
child.Show();
```

This adds a child to the MDI container.

On the frmParent menu item mnuClose_Click add the following code:

```
        this.Close();
```

Now we will work on our frmChild.

Add the Microsoft Web Browser Control to your Toolbox and drag it onto your form.

Name your controls as such:

Component	Name	Text
Textbox	txtURL	Blank
Button	btnLoadPage	Go
Button	btnBack	Back
Button	btnForward	Fwd
Button	btnHome	Home
Button	btnStop	Stop

Add the following code to the Button_Click events:

btnLoadPage

```
        WebBrowser1.Navigate(txtURL.Text);
```

btnBack

      WebBrowser1.GoBack();

btnForward

      WebBrowser1.GoForward();

btnHome

      WebBrowser1.GoHome();

btnStop

      WebBrowser1.Stop();

Add the following code to the mnuClose_Click event:

      this.Close();

Run you program and see what happens. Notice that your web browser stays limited in size. To alleviate this problem, add a frmChild_Resize event to your form. And add the following code:

```
WebBrowser1.Left = 0;
        WebBrowser1.Top = txtURL.Top + 25;
        WebBrowser1.Width = this.Width - 10;
        WebBrowser1.Height = this.Height - 10;
```

Now run your program and see if it works. Submit your source code and a screen shot of your running program.

More Console Applications

In this lab you will create several more console applications using a variety of techniques that you have used in the past 3 days.

1. Write a Console Application that will input a single letter and convert it to a telephone digit. Use the following conversion:

2 – ABC   3 – DEF   4 – GHI   5 – JKL   6 – MNO   7 – PRS
8 – TUV   9 - WXY

Note that Q and Z do not correspond to a value.

2. Zeller's congruence is an algorithm devised by Christian Zeller to calculate the day of the week for any Julian or Gregorian calendar date. It can be considered to be based on the conversion between Julian day and the calendar date.

For the Gregorian calendar, Zeller's congruence is

$$h = \left(q + \left\lfloor \frac{13(m+1)}{5} \right\rfloor + K + \left\lfloor \frac{K}{4} \right\rfloor + \left\lfloor \frac{J}{4} \right\rfloor - 2J \right) \mod 7,$$

where

- h is the day of the week (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
- q is the day of the month
- m is the month (3 = March, 4 = April, 5 = May, ..., 14 = February)
- K the year of the century (year mod 100).
- J is the zero-based century (actually year \ 100) For example, the zero-based centuries for 1995 and 2000 are 19 and 20 respectively (to not be confused with the common ordinal century enumeration which indicates 20th for both cases).

NOTE: In this algorithm January and February are counted as months 13 and 14 of the previous year. E.g. if it is 2 February 2010, the algorithm counts the date as the second day of the fourteenth month of 2009 (02/14/2009 in DD/MM/YYYY format)

Implementation in software can become a problem as the formula relies on the mathematician's definition of modulo division, which means that −2 mod 7 is equal to positive 5. Unfortunately, the way most computer languages implement the remainder function, −2 mod 7 returns a result of −2. So, to implement Zeller's congruence on a computer, the formulas should be altered slightly to ensure a

positive numerator. The simplest way to do this is to replace $-2J$ by $+5J$. So the formula becomes:

$$h = \left(q + \left\lfloor \frac{13(m+1)}{5} \right\rfloor + K + \left\lfloor \frac{K}{4} \right\rfloor + \left\lfloor \frac{J}{4} \right\rfloor + 5J \right) \mod 7,$$

In Python, -2 % 7 is 5 so you can use the first formula. Your task is to find out how Visual C# implement modulo division and use the appropriate formula.

3. Modify problem 1 so you can enter a phone number of the form XXX-XXXX and it will find a word to from a word list. If you would like to solve this problem in Python, you are more than welcome to.

When you have completed these applications, submit your source code and a sample output.