IV. Windows Forms

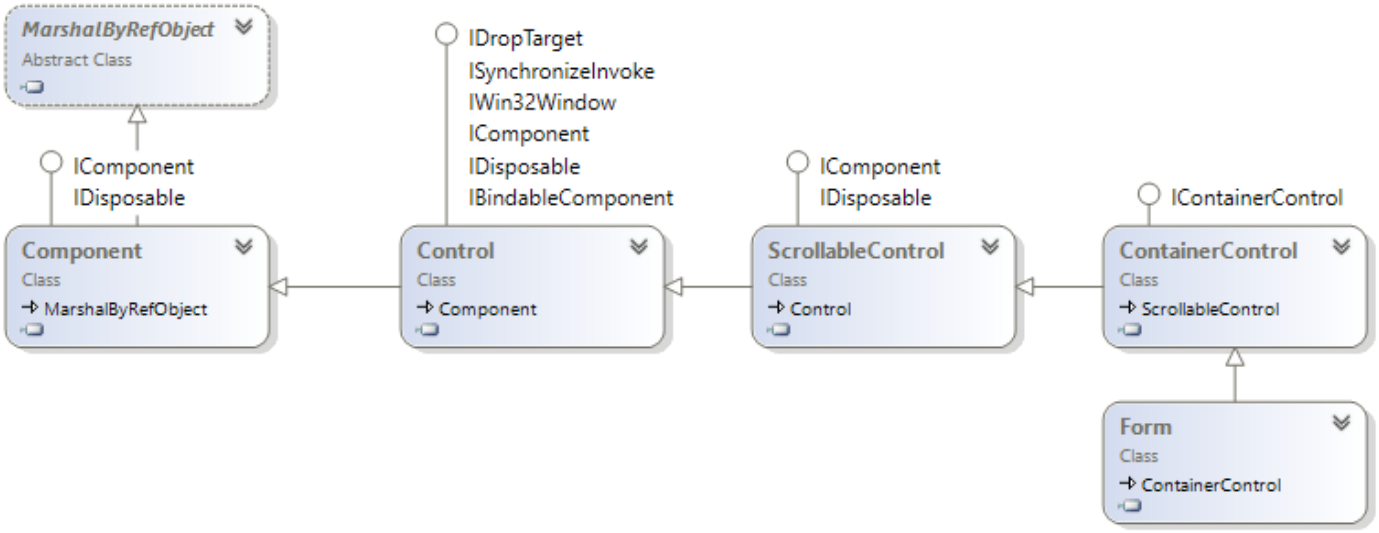
Contents

1. Application Class

Assignment

1) Create a new project with the name “MouseEvents”
2) Change the name of the default form to “MainForm”

2. Form Class and Control Class



2.1. Partial classes

It is possible to split the definition of a class or a struct, an interface or a method over two or more source files. Each source file contains a section of the type or method definition, and all parts are combined when the application is compiled.

Assignment

1. Open the "*.Designer.cs" file associated to the form

2.2. Properties

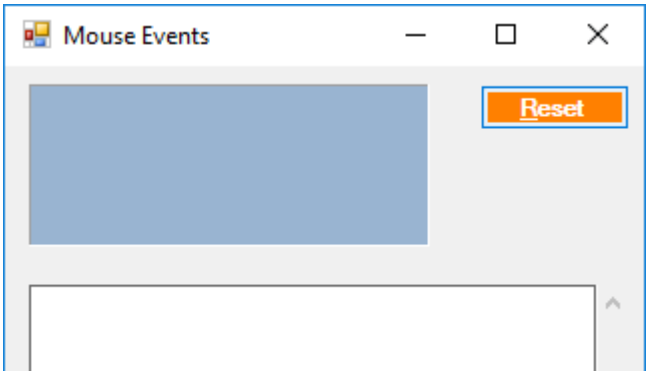
Frequently used properties:

- **Design:** Name, etc.
- **Appearance:** Text, ForeColor, BackColor, Font, etc.

Assignment

C# Sample code available at http://online.ase.ro – "MouseEvents" Sample

1. Create the following UI



2.3. Mouse Events

Event	Event argument	Description
Click	EventArgs	Raised when the control is clicked.
DoubleClick	EventArgs	Raised when the control is double-clicked.
MouseEnter	EventArgs	Raised when the mouse cursor enters the control.
MouseHover	EventArgs	Raised when the mouse cursor hovers over the control.
MouseLeave	EventArgs	Raised when the mouse cursor leaves the control.
MouseDown	MouseEventArgs	Raised when the mouse cursor is over the control and a mouse button is pressed.
MouseMove	MouseEventArgs	Raised when the mouse cursor is moved over the control.
MouseWheel	MouseEventArgs	Raised when the control has focus and the mouse wheel is rotated.
MouseUp	MouseEventArgs	Raised when the mouse cursor is over the control and a mouse button is released.

Click events are logically higher-level events of a control. They are often raised by other actions, such as pressing the ENTER key when the control has focus.

Depressing a mouse button when the cursor is over a control typically raises the following series of events from the control:

- MouseDown event.
- Click event.
- MouseClick event.
- MouseUp event.

Assignment

C# Sample code available at http://online.ase.ro – "MouseEvents" Sample

1. Add the following code

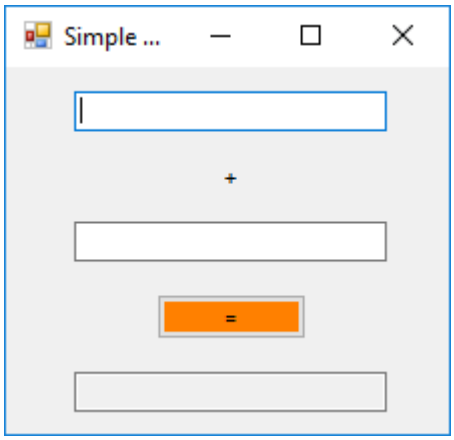
```
public partial class MainForm : Form
{
	public MainForm()
	{
		InitializeComponent();
	}

	private void btnReset_Click(object sender, EventArgs e)
	{
		lbl.Text = "";
		txt.Text = "";
	}

	//similar: lbl_MouseHover, lbl_MouseLeave, lbl_Click, lbl_DoubleClick
	private void lbl_MouseEnter(object sender, EventArgs e)
	{
		lbl.Text = "MouseEnter";
		TextBoxDraw("###Label MouseEnter");
	}

	//similar: lbl_MouseMove, lbl_MouseUp, lbl_MouseWheel
	private void lbl_MouseDown(object sender, MouseEventArgs e)
	{
		lbl.Text = "MouseDown";
		var str = "###Label MouseDown";
		str += Environment.NewLine + "Button:   " + e.Button;
		str += Environment.NewLine + "Clicks:   " + e.Clicks;
		str += Environment.NewLine + "Delta:   " + e.Delta;
		str += Environment.NewLine + "X:   " + e.X;
		str += Environment.NewLine + "Y:   " + e.Y;
		TextBoxDraw(str);
	}

	//similar: OnMouseHover, OnMouseLeave
	protected override void OnMouseEnter(EventArgs e)
	{
		base.OnMouseEnter(e);
		TextBoxDraw("###Form MouseEnter");
	}

	private void TextBoxDraw(string str)
	{
		txt.AppendText(Environment.NewLine + str);
	}
}
```

2.4. Keyboard Events

Event	Event data	Description
KeyDown	KeyEventArgs	Raised when a key is pressed. The KeyDown event occurs prior to the KeyPress event.
KeyPress	KeyPressEventArgs	Raised when a character generating key is pressed. The KeyPress event occurs after the KeyDown event and before the KeyUp event.
KeyUp	KeyEventArgs	Raised when a key is released.

Assignment

We want to create a numeric only TextBox that can be used to build a simple calculator application, such as the one bellow.



C# Sample code available at http://online.ase.ro – "KeyEvents" Sample

1. Create a new project with the name "KeyEventsNumericTextBox"
2. Add a TextBox and name it "tbNumericTextBox"
3. Add the following event handler

```
private void tbNumericTextBox_KeyPress(object sender, KeyPressEventArgs e)
{
      OnKeyPress(e);

      if (!char.IsDigit(e.KeyChar))
      {
            // Consume this invalid key
            e.Handled = true;
      }
}
```

4. Change the previous event handler in order to allow the use of the "BackSpace" key.
5. Change the previous event handler in order to allow the digit separator for the current culture.

2. Complex Controls

2.1. ListView

2.2. TreeView

Further reading: link

3. Secondary Forms

Where can we change the default form?