Event Driven Programming

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Alliance with FPT Education

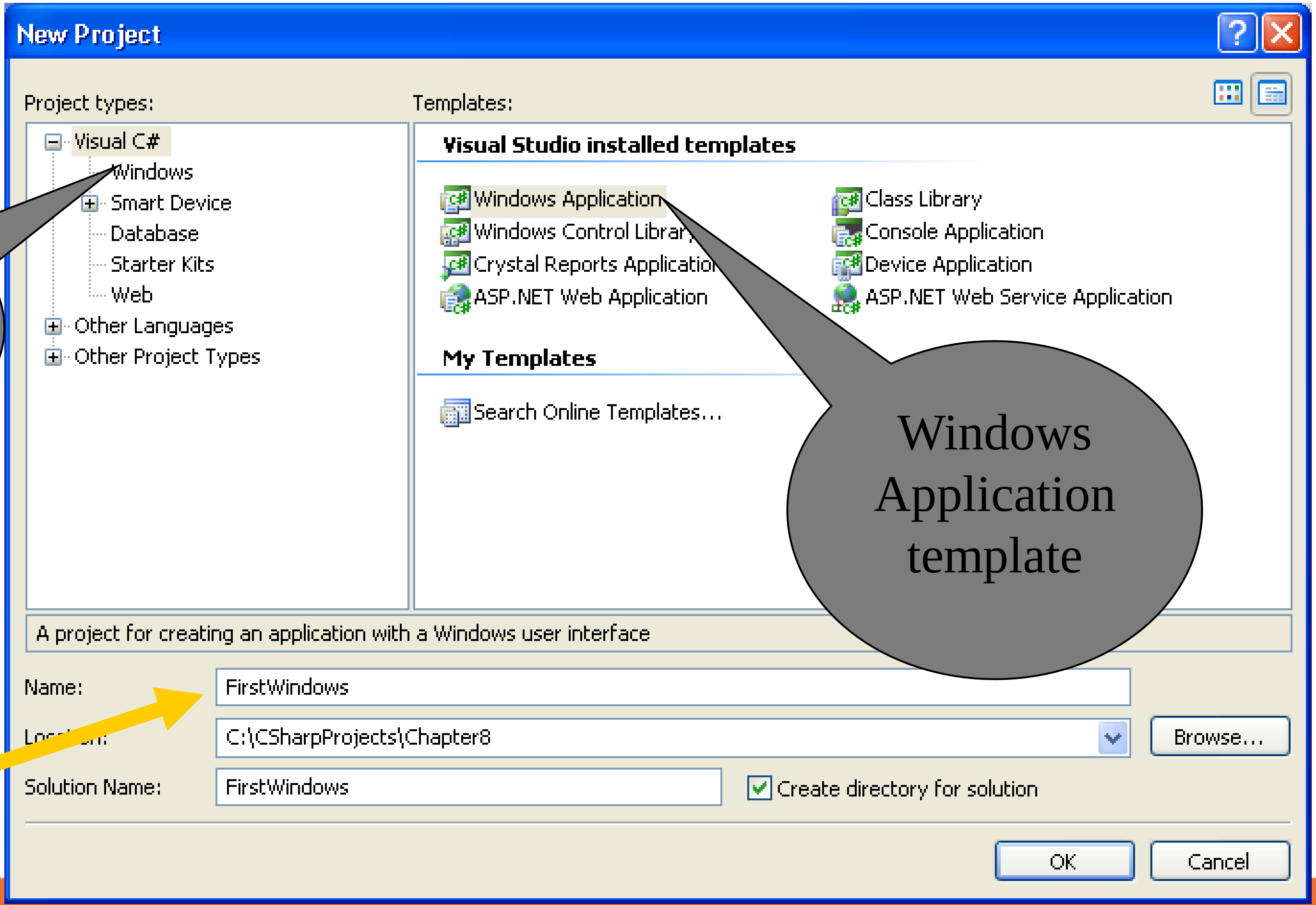
Topics

- GUI & Visual programming
- Form and controls
  - Label
  - Textbox
  - Button
- Event-driven programming
- Form and controls (cnt.)
  - CheckedBox
  - Radio Button
  - ListBox
  - ComboBox
  - Menu
  - ContextMenu

Graphical user interface (gui)

- Console application: Program interacts with user by commands
- Graphical user interface:
  - Menus
  - Text with colors, size, font
  - Image, picture
  - Button
  - Select button
  - Scrollbar
  - Etc.

Creating GUI application



Select File New Project

Windows Application template

Name

A project for creating an application with a Windows user interface

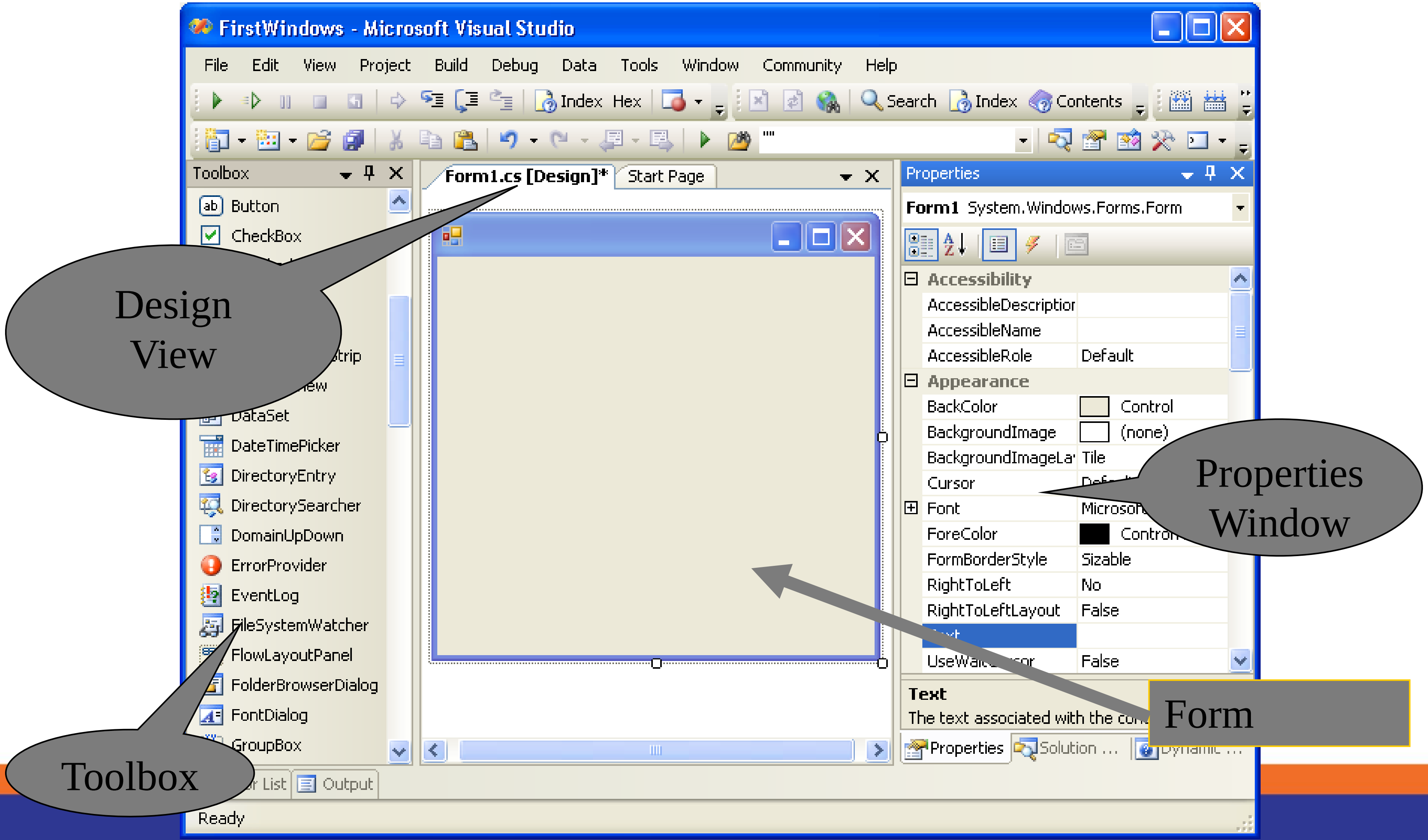
Name: FirstWindows

Location: C:\CSharpProjects\Chapter8

Solution Name: FirstWindows

☑ Create directory for solution

Creating GUI application



Form1 System.Windows.Forms.Form

⊟ **Accessibility**	
AccessibleDescriptior	
AccessibleName	
AccessibleRole	Default
⊟ **Appearance**	
BackColor	Control
BackgroundImage	(none)
BackgroundImageLa	Tile
Cursor	Def
⊞ Font	Microsof
ForeColor	Contro
FormBorderStyle	Sizable
RightToLeft	No
RightToLeftLayout	False
ext	
UseWai	False

Text

The text associated with the con

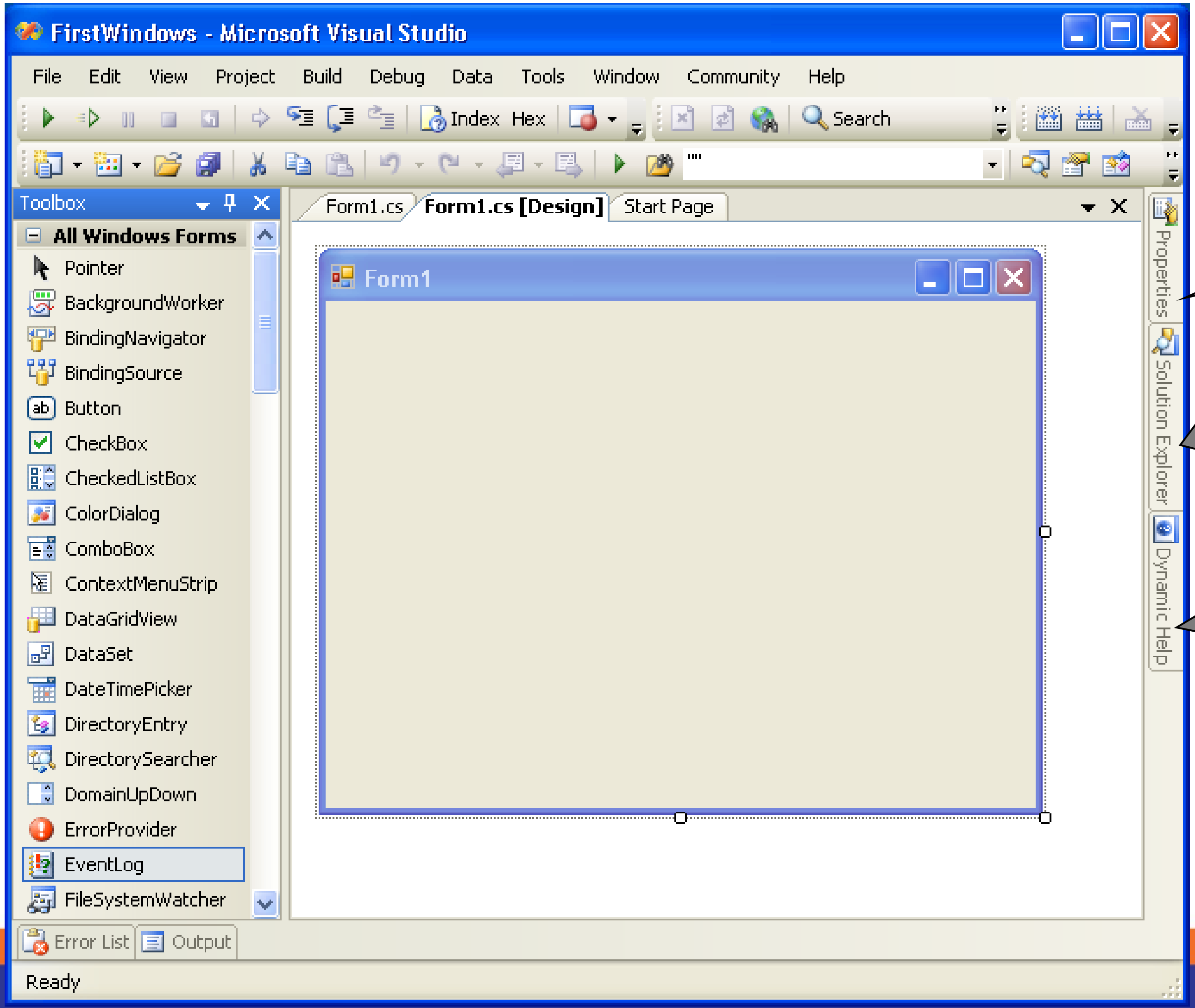
Design View

Properties Window

Form

Toolbox

Creating GUI application



Properties Auto-hide

Solution Explorer

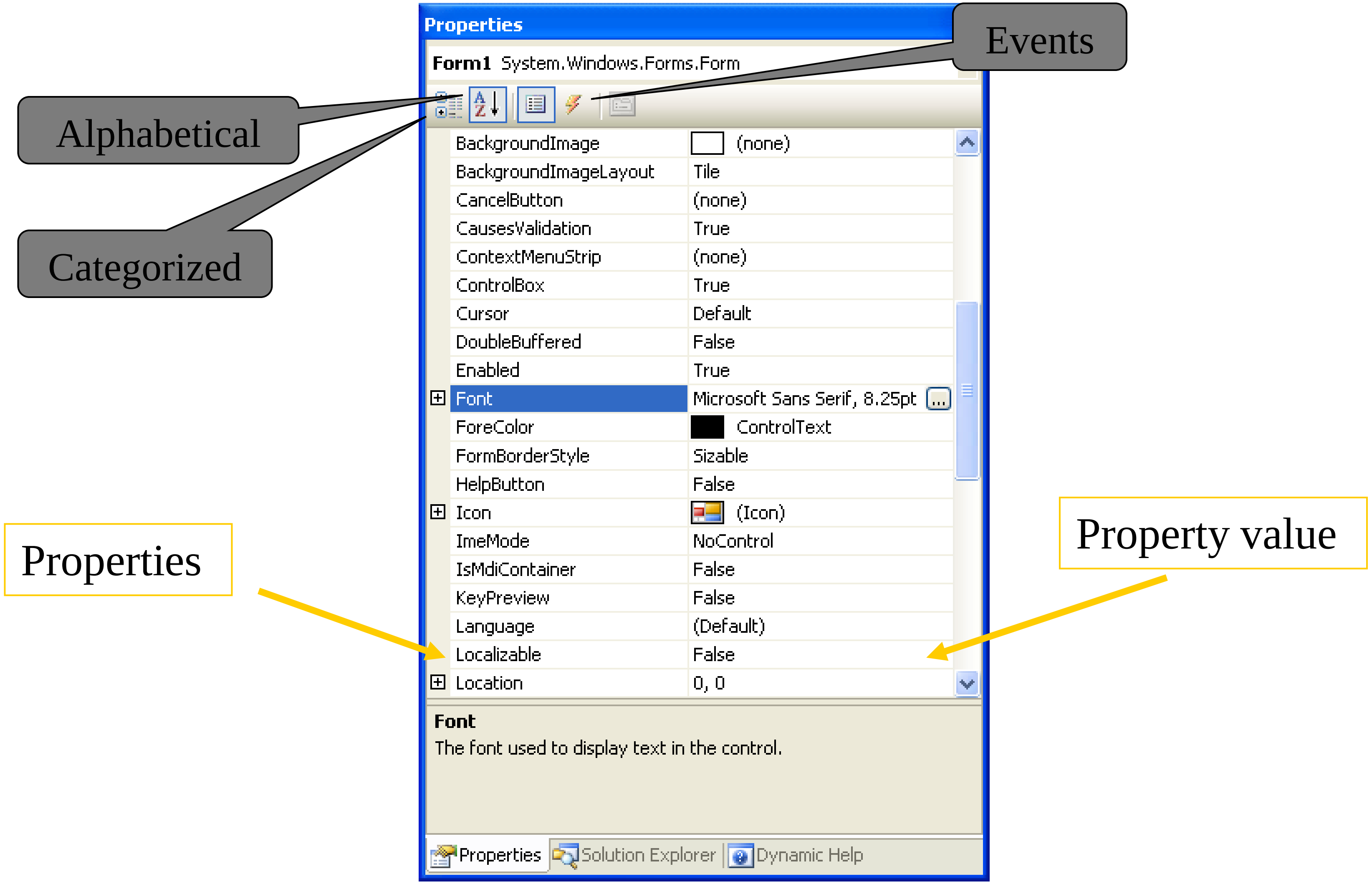
Dynamic Help

Forms

- Main program windows, includes controls
- Form class has a lot of properties and methods
  - Properties can be changed in Design View
  - Or in Code View

- Form class has many events that can be programmed as programmer wants
  - Close form
  - Mouse moves
  - Mouse clicks (left or right)
  - etc

Form Properties



Form1 System.Windows.Forms.Form

BackgroundImage	(none)
BackgroundImageLayout	Tile
CancelButton	(none)
CausesValidation	True
ContextMenuStrip	(none)
ControlBox	True
Cursor	Default
DoubleBuffered	False
Enabled	True
⊞ Font	Microsoft Sans Serif, 8.25pt
ForeColor	ControlText
FormBorderStyle	Sizable
HelpButton	False
⊞ Icon	(Icon)
ImeMode	NoControl
IsMdiContainer	False
KeyPreview	False
Language	(Default)
Localizable	False
⊞ Location	0, 0

Font
The font used to display text in the control.

Events

Alphabetical

Categorized

Properties

Property value

Form Properties

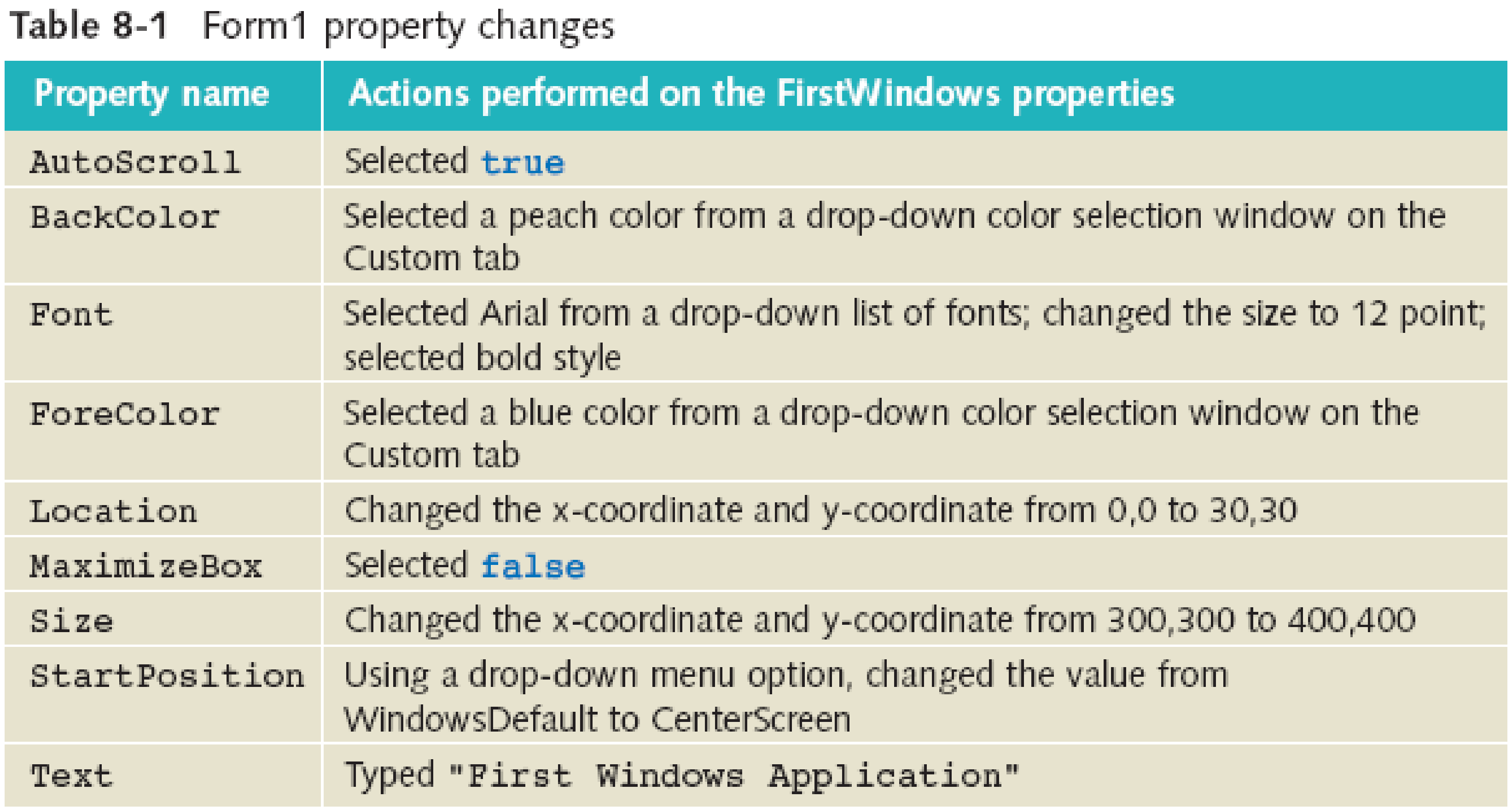


Table 8-1 Form1 property changes

Property name	Actions performed on the FirstWindows properties
`AutoScroll`	Selected `true`
`BackColor`	Selected a peach color from a drop-down color selection window on the Custom tab
`Font`	Selected Arial from a drop-down list of fonts; changed the size to 12 point; selected bold style
`ForeColor`	Selected a blue color from a drop-down color selection window on the Custom tab
`Location`	Changed the x-coordinate and y-coordinate from 0,0 to 30,30
`MaximizeBox`	Selected `false`
`Size`	Changed the x-coordinate and y-coordinate from 300,300 to 400,400
`StartPosition`	Using a drop-down menu option, changed the value from WindowsDefault to CenterScreen
`Text`	Typed `"First Windows Application"`

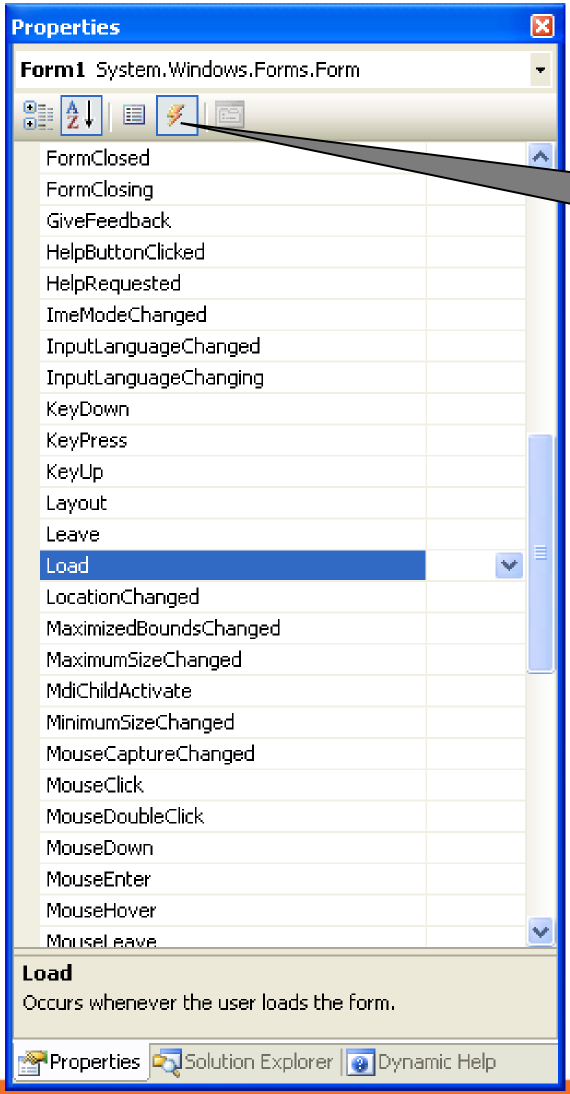
Form methods

- Several Form’s methods:
  - `Activate`: make Form object to get focus
  - `Close`: close Form object
  - `Hide`: hide Form object
  - `Show`: show Form object (user can see it now)

Form Events

- Many events can happen on a Form object: key board pressed, mouse clicked, mouse moved, etc.
- When an event happens, system will call a specific method for that event to response to it
- Programmer need to write that specific method
- Event-driven programming:
  - Event is the key. Logic of program is represented by events
  - Programmer select event that is useful for program to implement (not all)

Form Events



Load
Occurs whenever the user loads the form.

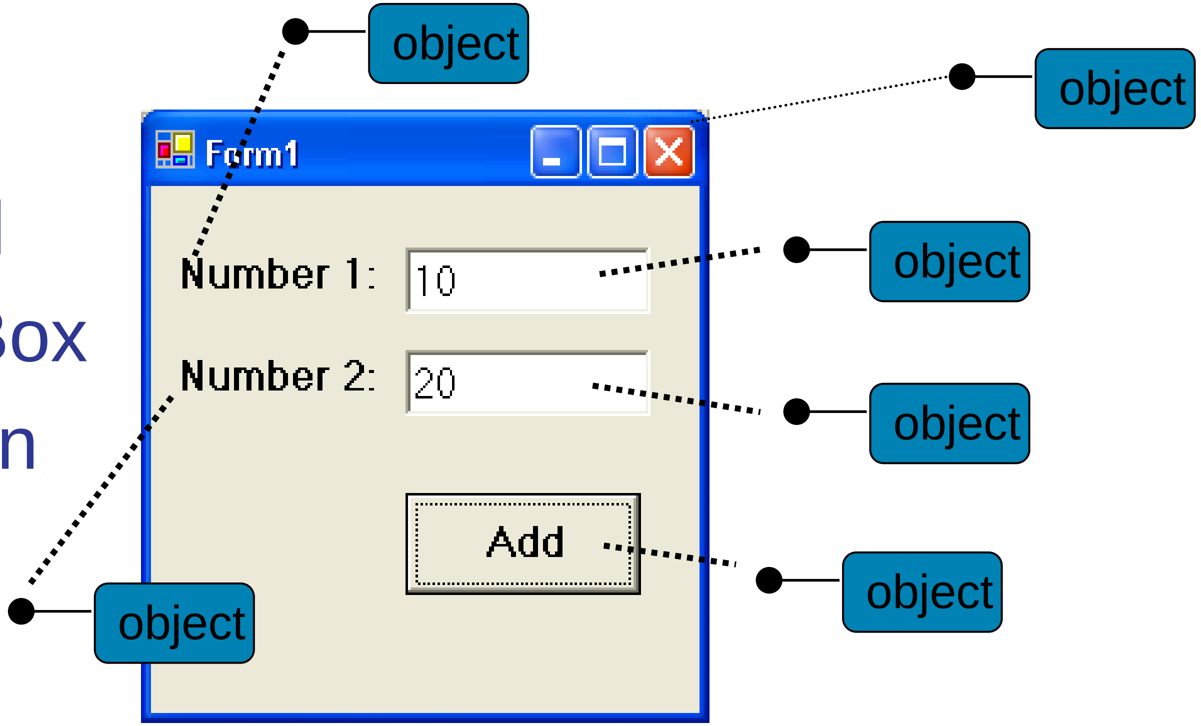
Click to view the list of Form's events

Controls

- Controls are:
  - Button, Label, TextBox, ComboBox, MainMenu, ListBox, CheckBox, RadioButton, and MonthCalendar, etc.
- Each control has different properties / methods / events. Some are common among controls (Text, Size, etc.)
- Controls are inherited from System.Windows.Forms.Control

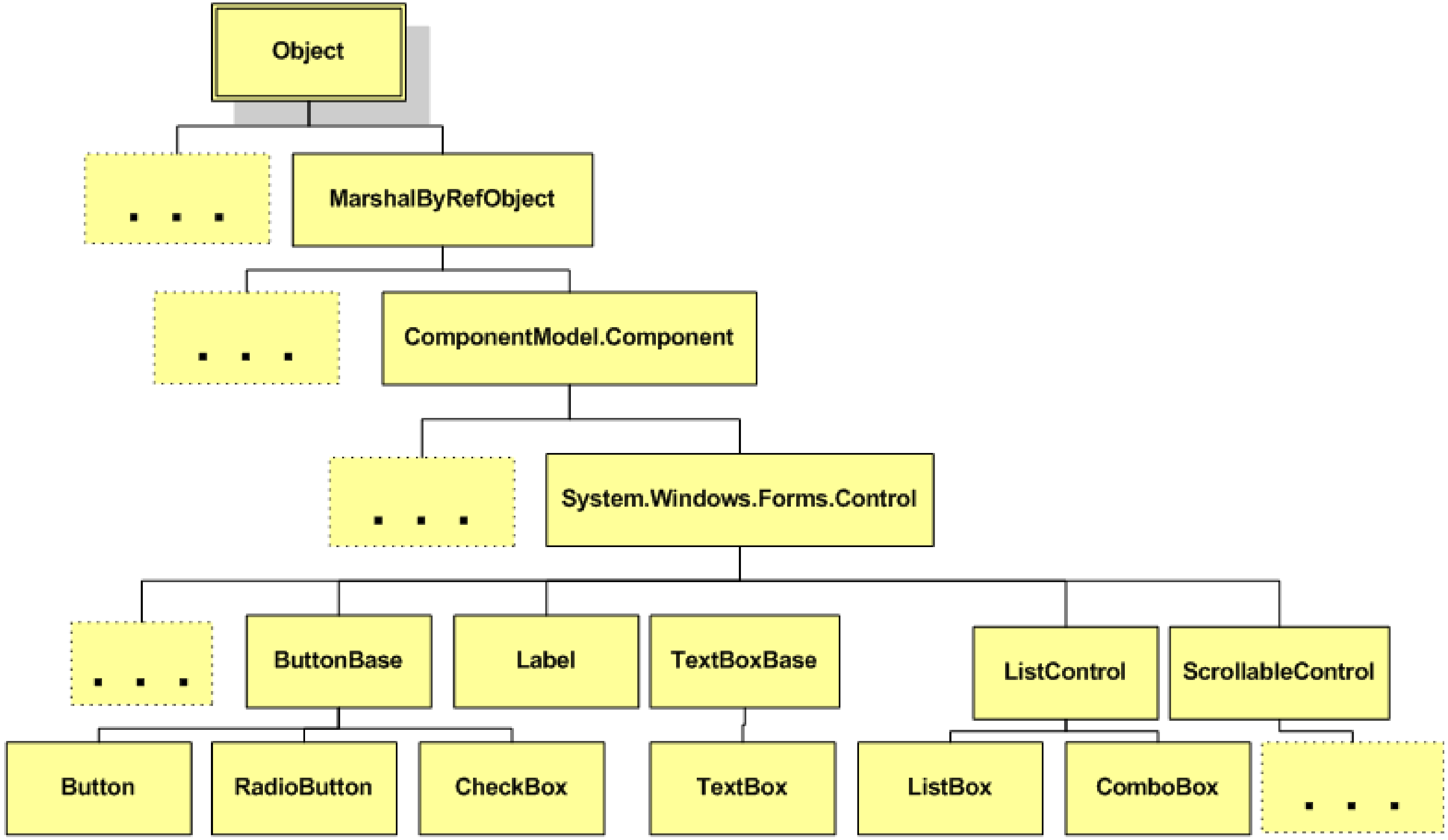
Sub classes of Control

- They are:
  - – System.Windows.Forms.Label
  - – System.Windows.Forms.TextBox
  - – System.Windows.Forms.Button
  - – V.v.

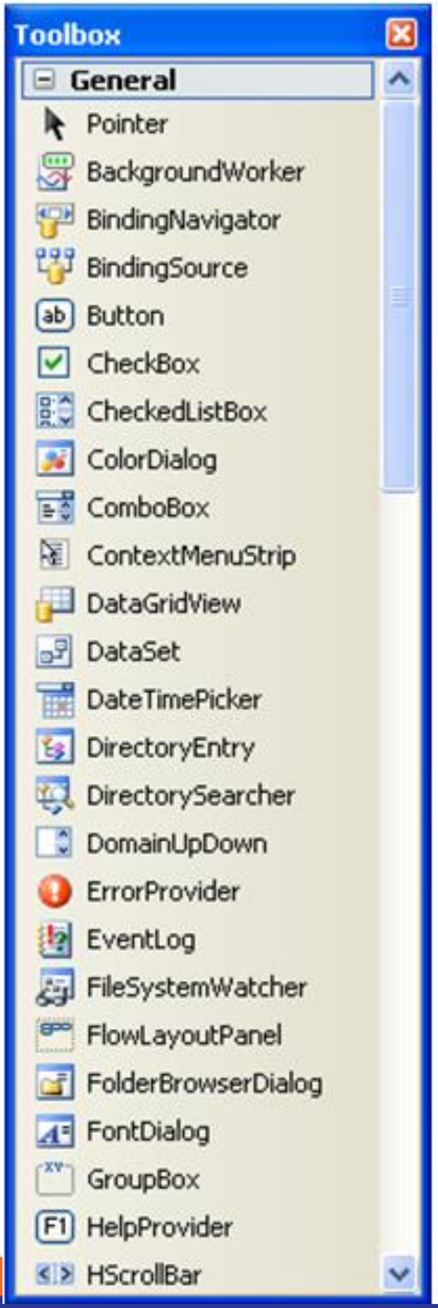


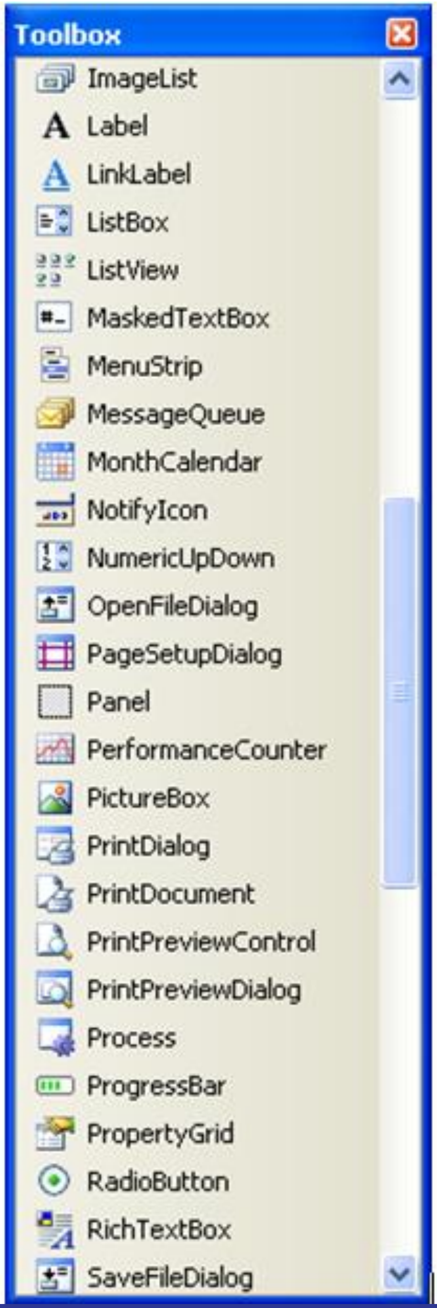
- Form's controls are object of these classes

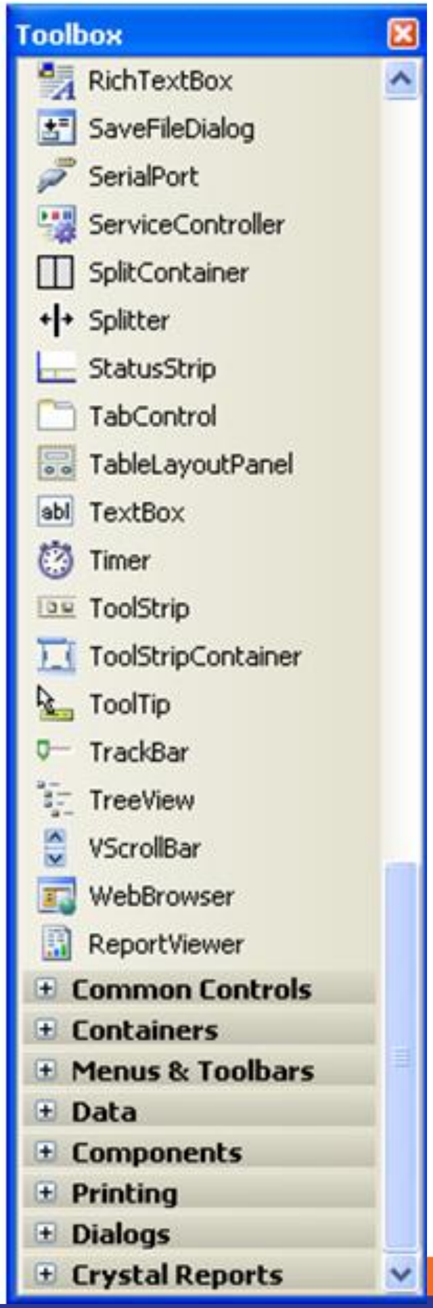
Inheritance tree of Controls



Controls examples







Add controls on Form (visual programming)

- From Toolbox, select and drag necessary control to Form
- Control position can be moved, size can be changed
- Controls alignment
  - Aligned
  - Same size
  - Horizontal align, vertical align
  - Etc.

Common properties of Controls

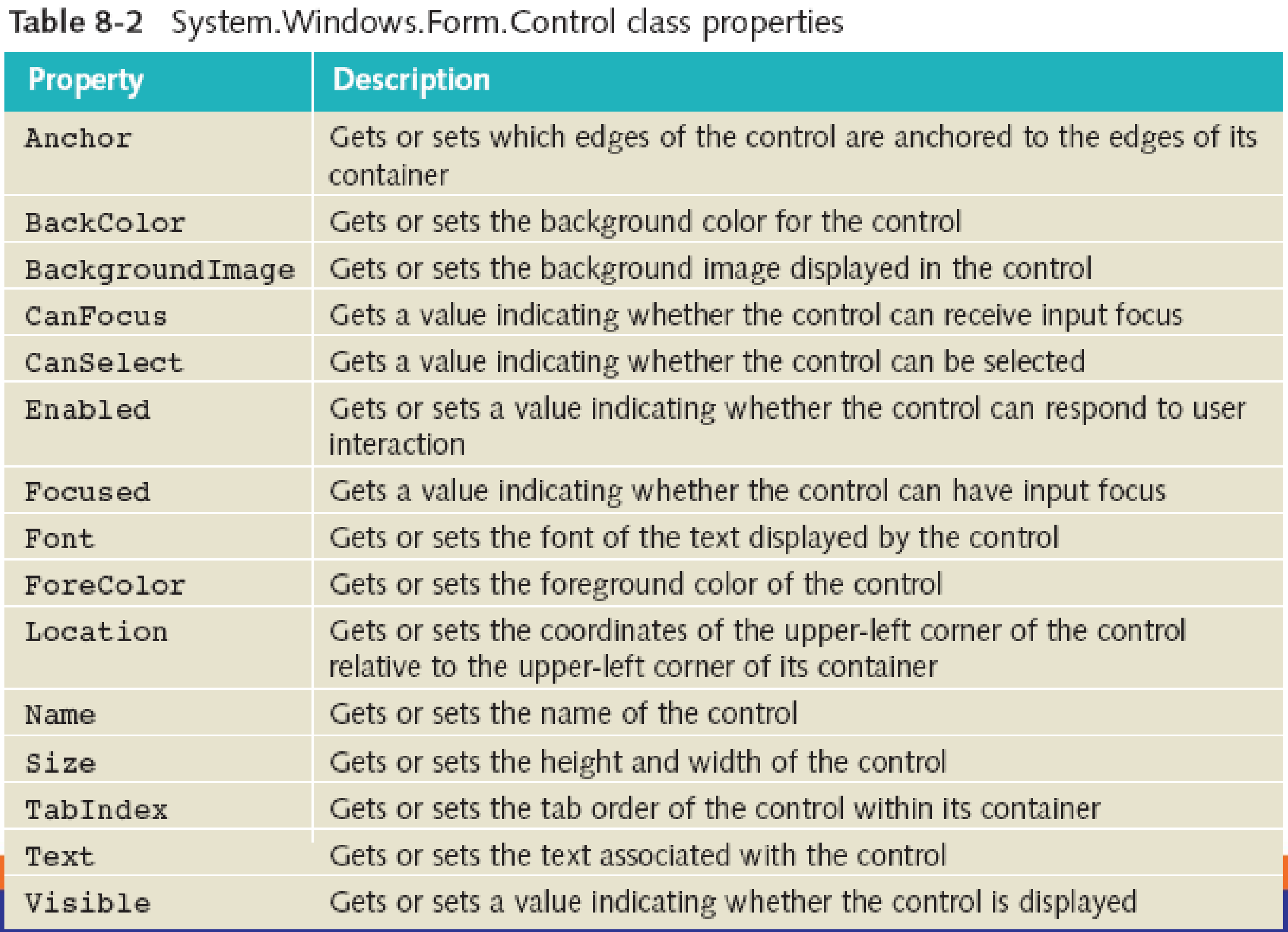
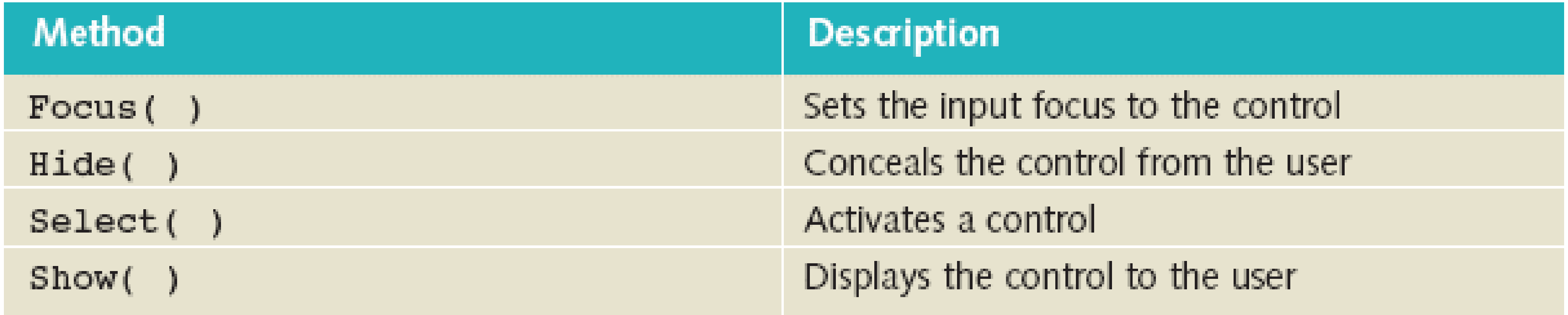


Table 8-2 System.Windows.Form.Control class properties

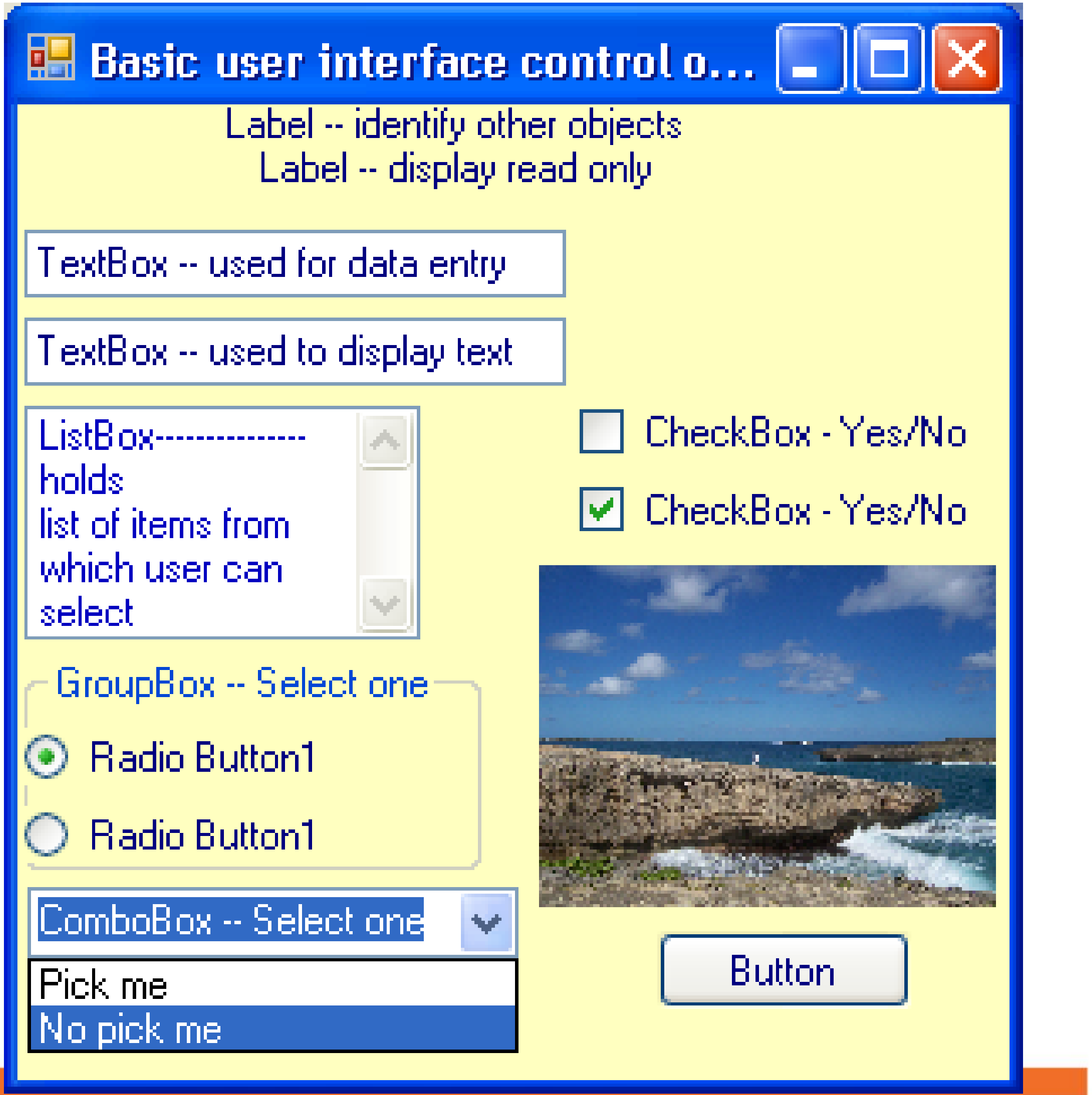
Property	Description
Anchor	Gets or sets which edges of the control are anchored to the edges of its container
BackColor	Gets or sets the background color for the control
BackgroundImage	Gets or sets the background image displayed in the control
CanFocus	Gets a value indicating whether the control can receive input focus
CanSelect	Gets a value indicating whether the control can be selected
Enabled	Gets or sets a value indicating whether the control can respond to user interaction
Focused	Gets a value indicating whether the control can have input focus
Font	Gets or sets the font of the text displayed by the control
ForeColor	Gets or sets the foreground color of the control
Location	Gets or sets the coordinates of the upper-left corner of the control relative to the upper-left corner of its container
Name	Gets or sets the name of the control
Size	Gets or sets the height and width of the control
TabIndex	Gets or sets the tab order of the control within its container
Text	Gets or sets the text associated with the control
Visible	Gets or sets a value indicating whether the control is displayed

Common method Controls



Method	Description
`Focus( )`	Sets the input focus to the control
`Hide( )`	Conceals the control from the user
`Select( )`	Activates a control
`Show( )`	Displays the control to the user

Controls example



Basic user interface control o...

Label -- identify other objects
Label -- display read only

TextBox -- used for data entry

TextBox -- used to display text

ListBox--------------
holds
list of items from
which user can
select

□ CheckBox - Yes/No

☑ CheckBox - Yes/No

GroupBox -- Select one

● Radio Button1

○ Radio Button1

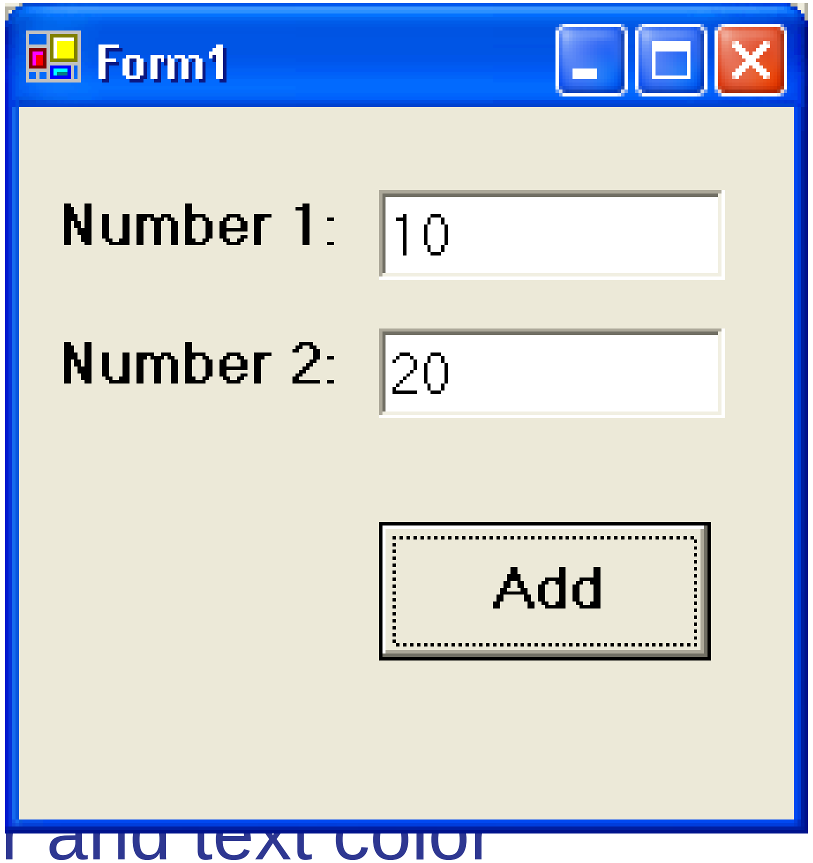
ComboBox -- Select one

Pick me
No pick me

Labels

- Showing texts
  - – Naming other controls
  - – Showing texts that user cannot change

- Important properties
  - – `Text`: content to show
  - – `Font`: font of text
  - – BackColor, ForeColor: background color and text color



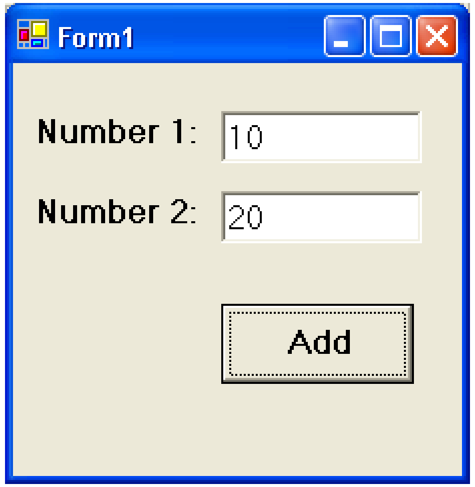
Number 1: 10

Number 2: 20

Command buttons

- A button that user can click to do something

- Important properties
  - Text: Content on button
  - Font: Font of text
  - Enabled: false => cannot click
- Event:
  - Click: Happen when button is clicked (by mouse or keyboard)



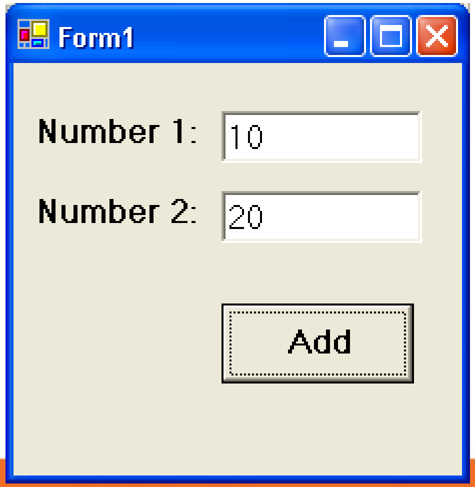
Number 1: 10

Number 2: 20

```
private void cmdAdd_Click(...)
{
  int  i, j, k;
  i = System.Convert.ToInt32(
this.txtNum1.Text );
  j = System.Convert.ToInt32(
this.txtNum2.Text );
  k = i + j;
  MessageBox.Show( "Sum = " + k.ToString()
);
}
```

Text boxes

- A control that
  - Show and allow user to change text content
  - Normally used for data input



Number 1: 10

Number 2: 20

- Important properties:
  - `Text`: content to show / edit
  - `Font`: font of text
  - `ReadOnly`: content can be viewed only

- Multiline textbox:
  - `MultiLine`: True
  - `Lines`: collection of lines in box
  - `ScrollBars`: none, horizontal, vertical, or both

Text box events

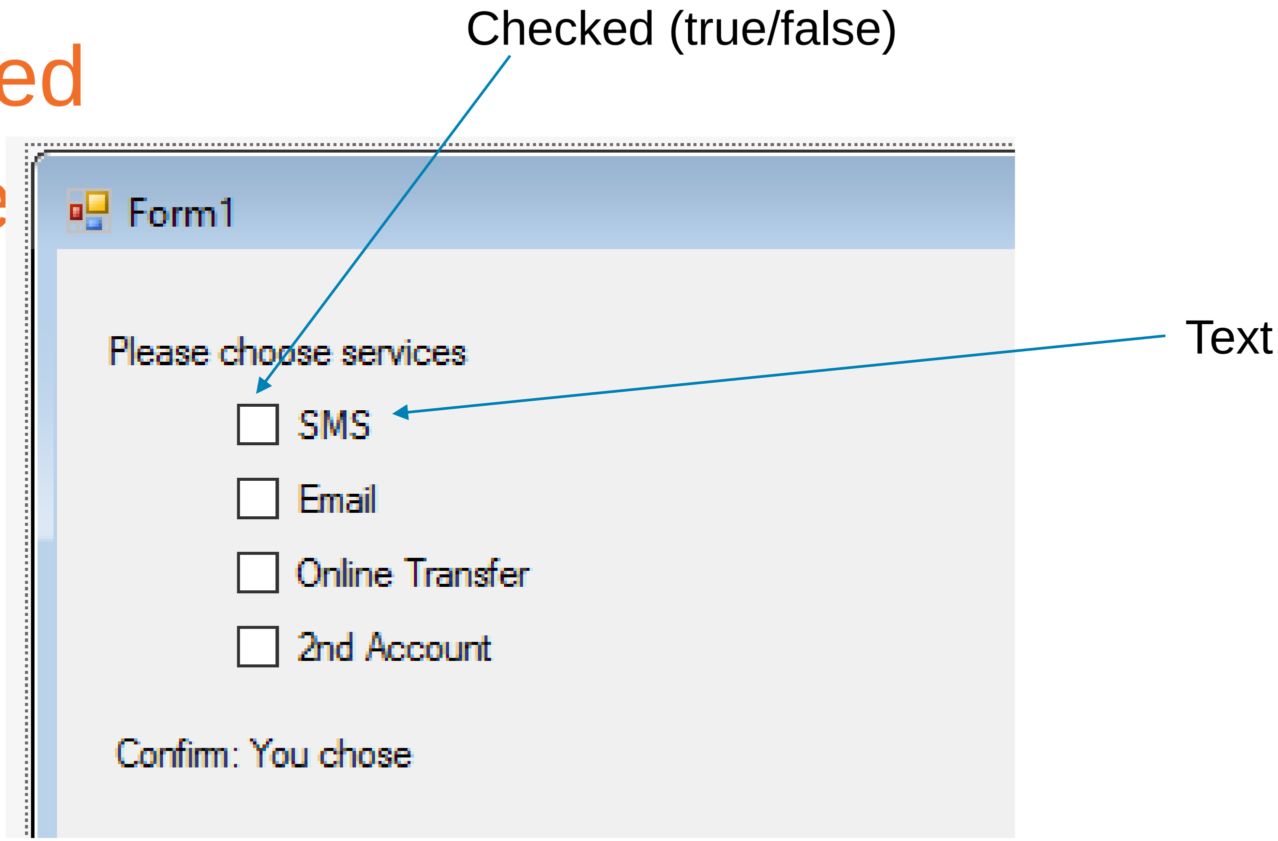
- Some important event
  - `Enter`, `Leave`: happens when focus is changed
  - `KeyPress`: happens when keyboard is pressed (when control has focus)
  - `KeyDown`, `KeyUp`: happens when keyboard is down / up
  - `TextChanged`: happens when content is changed

Demo

- Demo some programs to illustrate Form, Label, Textbox, Command and MessageBox
  - Method
  - Properties
  - Events

Checked Box

- Properties: Text, Checked
- Event: CheckedChange



Checked (true/false)

Text

Form1

Please choose services

□ SMS

□ Email

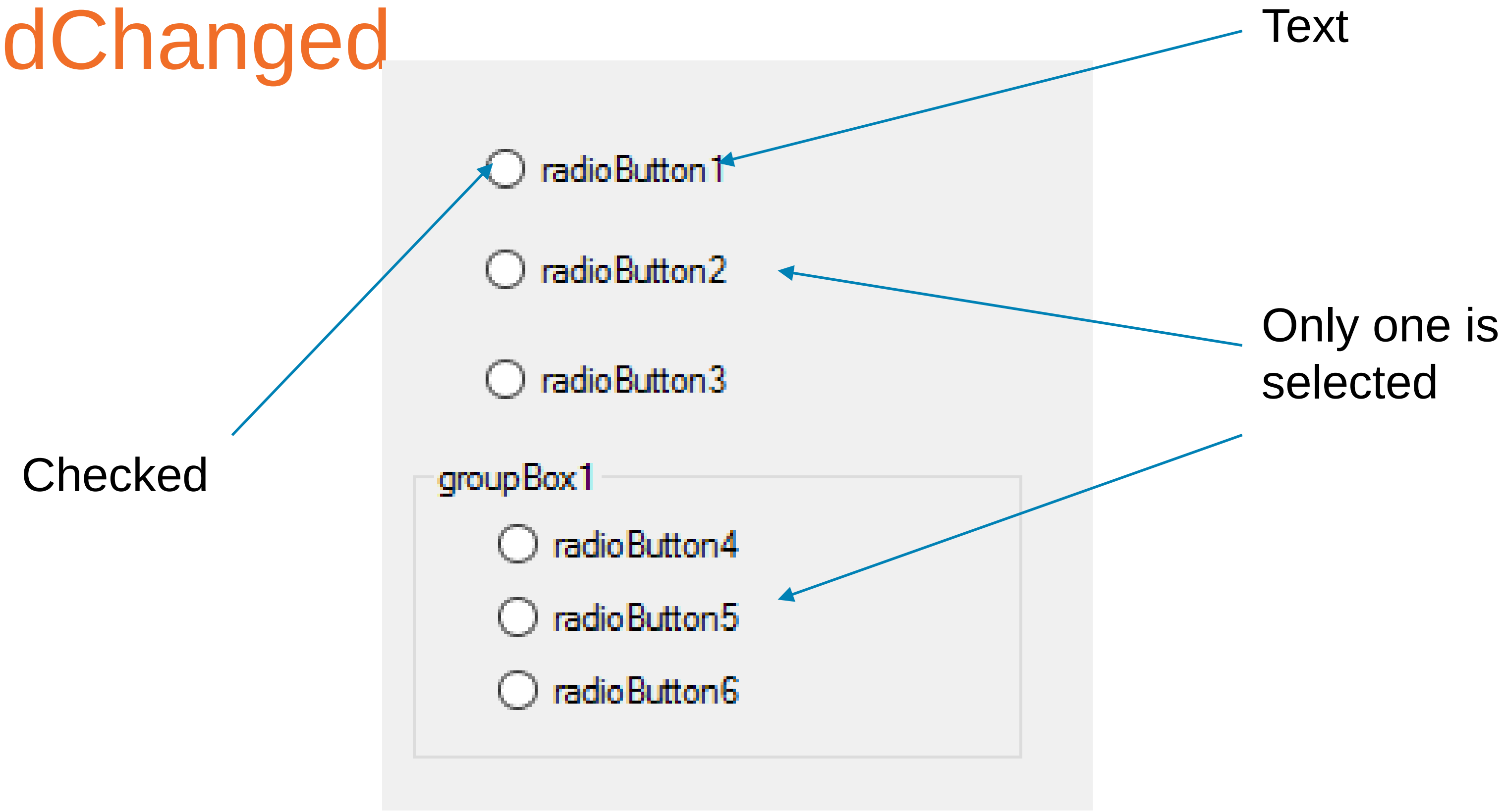
□ Online Transfer

□ 2nd Account

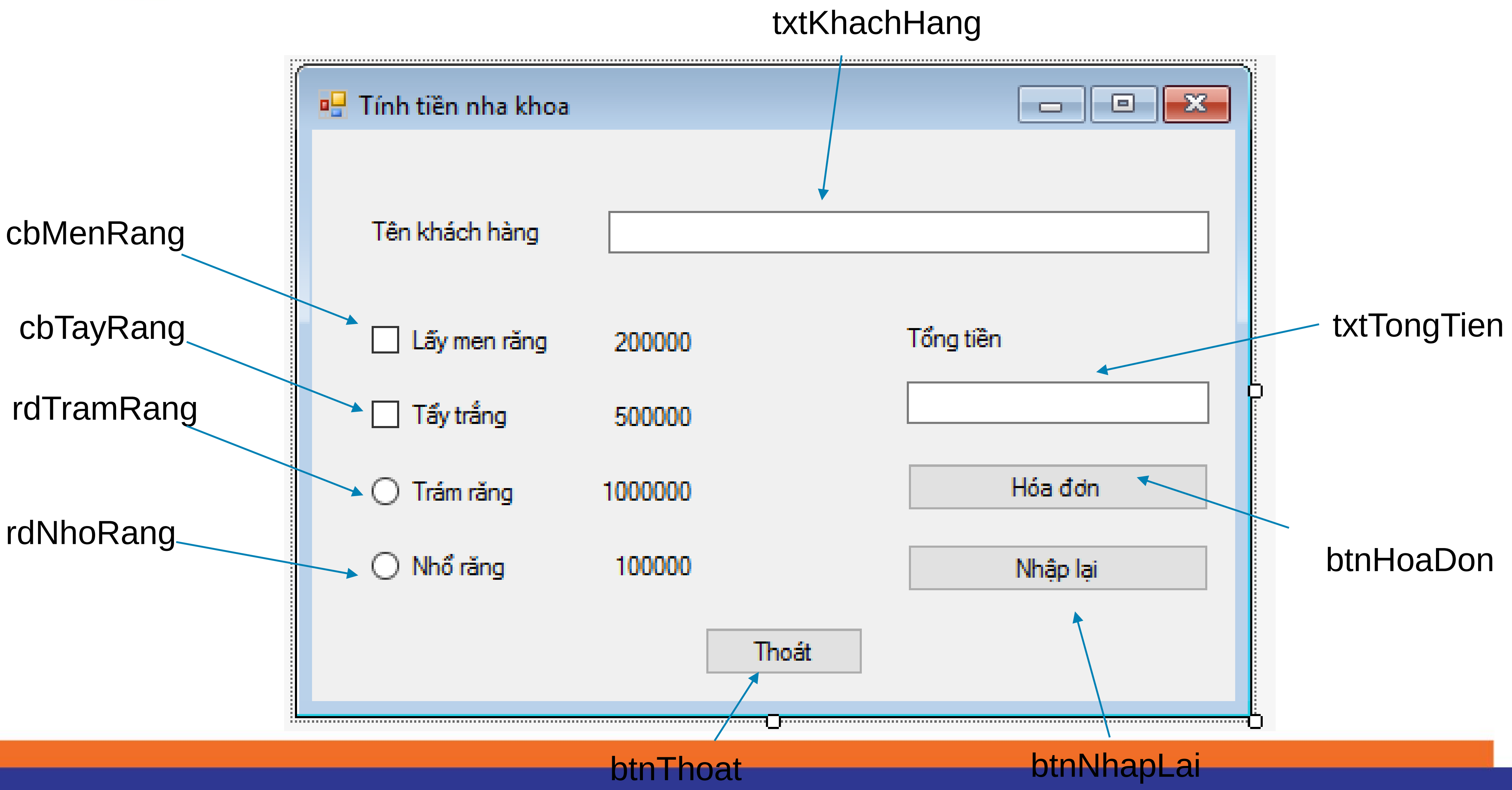
Confirm: You chose

Radio button

- Properties: Text, Checked
- Event: CheckedChanged



Demo



Tính tiền nha khoa

Tên khách hàng

□ Lấy men răng 200000

□ Tẩy trắng 500000

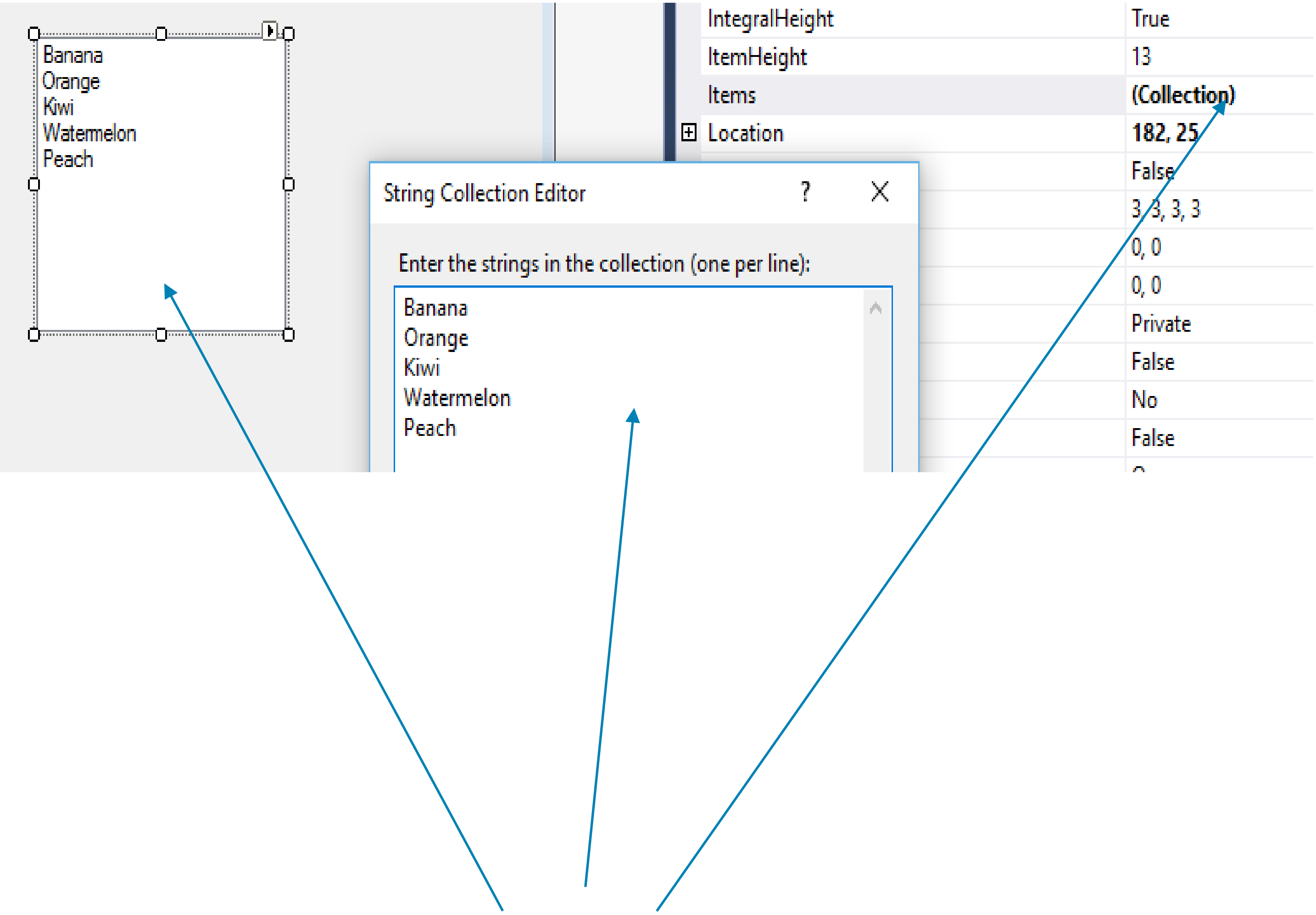
○ Trám răng 1000000

○ Nhổ răng 100000

Tổng tiền

ListBox

- Properties:
  - Items, SelectedItems, SelectedItem, SelectedIndex, SelectedIndices
  - SelectionMode (One, Multi)
- Event: SelectedIndexChanged



Banana
Orange
Kiwi
Watermelon
Peach

IntegralHeight	True
ItemHeight	13
Items	(Collection)
⊞ Location	182, 25
	False
	3, 3, 3, 3
	0, 0
	0, 0
	Private
	False
	No
	False

String Collection Editor

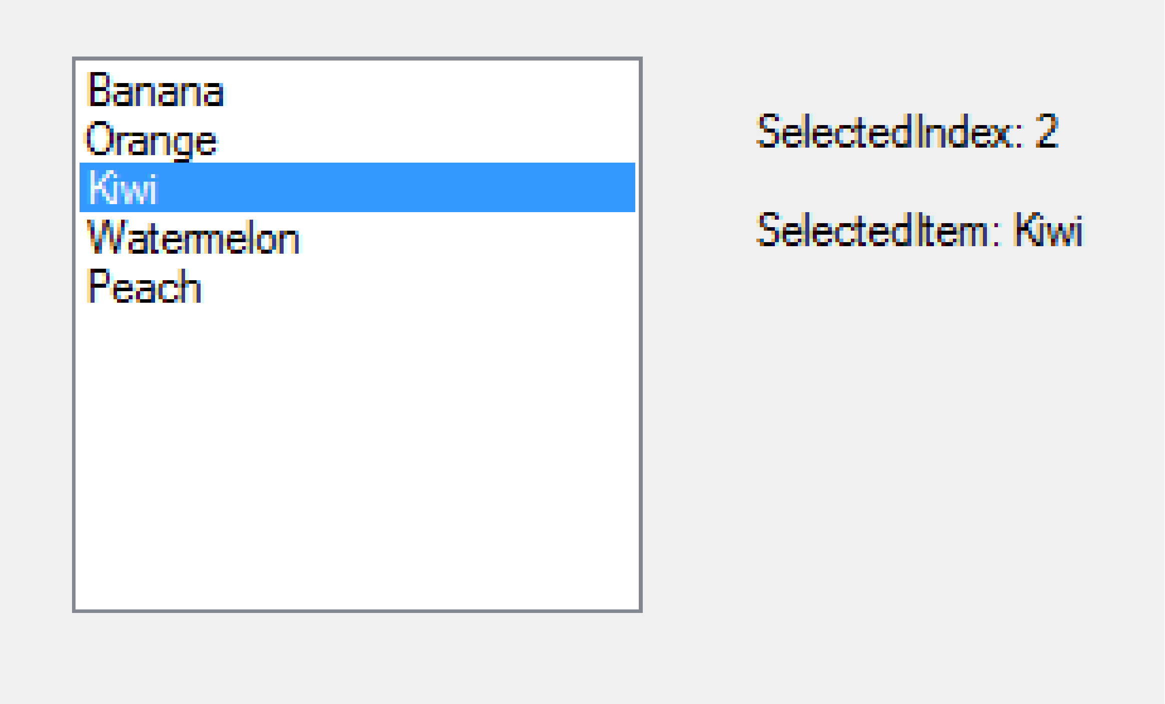
Enter the strings in the collection (one per line):

Banana
Orange
Kiwi
Watermelon
Peach

Items

ListBox

- Properties:
  - Items, SelectedItems, SelectedItem, SelectedIndex, SelectedIndices
  - SelectionMode (One, Multi)
- Event: SelectedIndexChanged

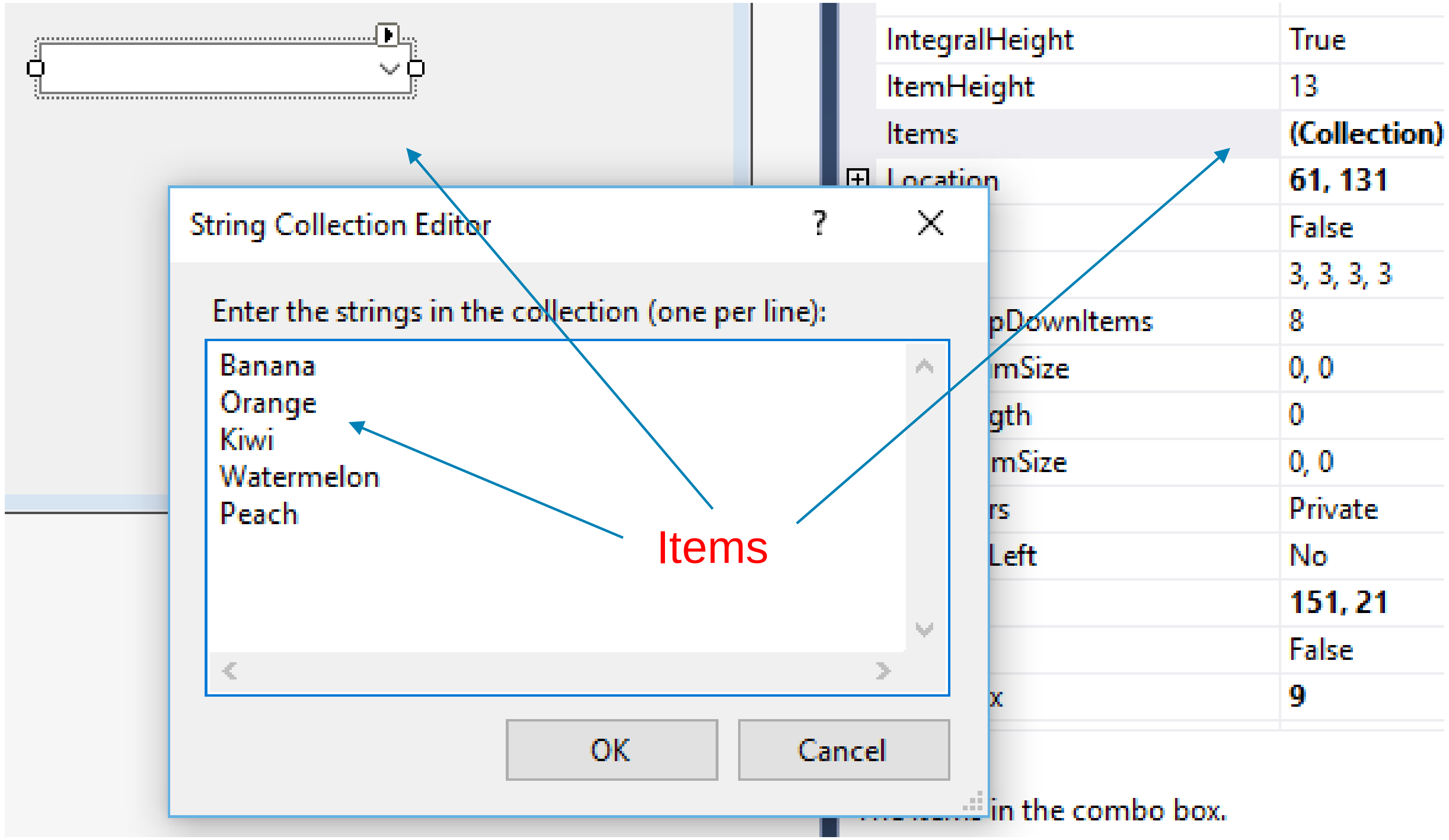


SelectedIndex: 2

SelectedItem: Kiwi

ComboBox

- Properties:
  - Items, SelectedItems, SelectedItem, SelectedIndex, SelectedIndices
- Event: SelectedIndexChanged



IntegralHeight	True
ItemHeight	13
Items	(Collection)
Location	61, 131
	False
	3, 3, 3, 3
pDownItems	8
mSize	0, 0
gth	0
mSize	0, 0
rs	Private
Left	No
	151, 21
	False
x	9

in the combo box.

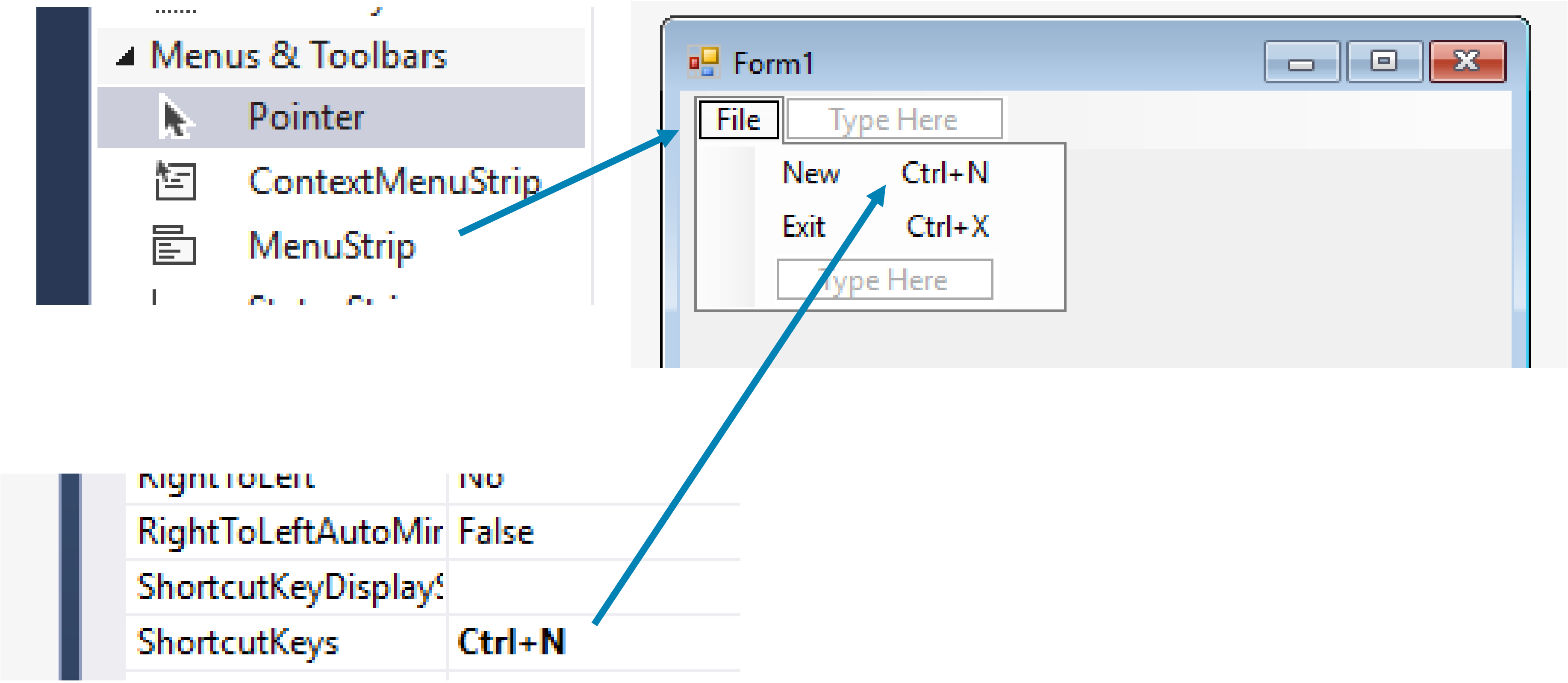
String Collection Editor

Enter the strings in the collection (one per line):

Banana
Orange
Kiwi
Watermelon
Peach

Menu

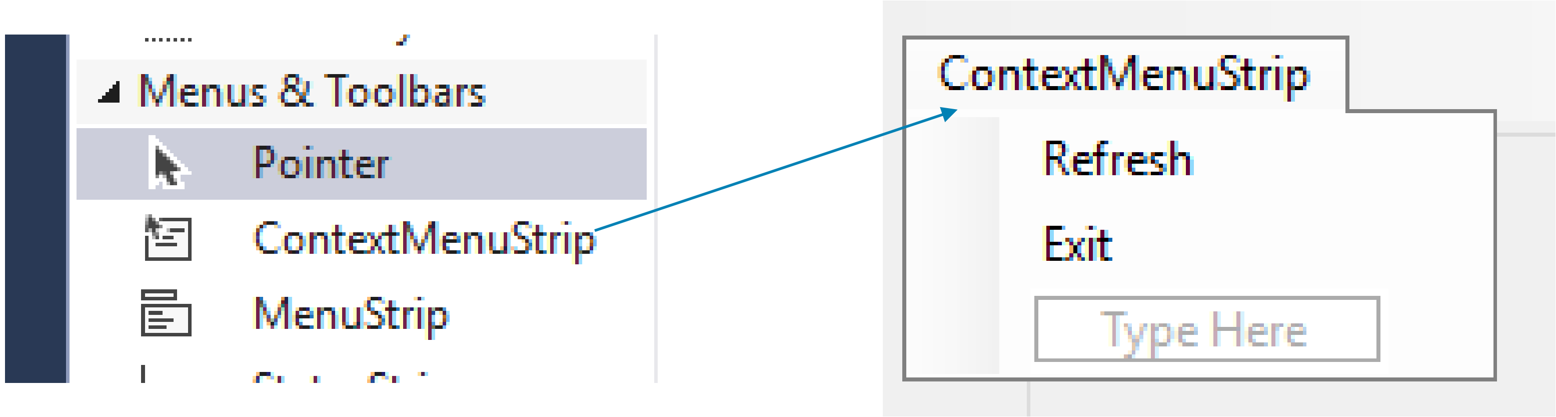
- Properties: Items (Text, ShotcutKeys)
- Event: Click (for each Item)

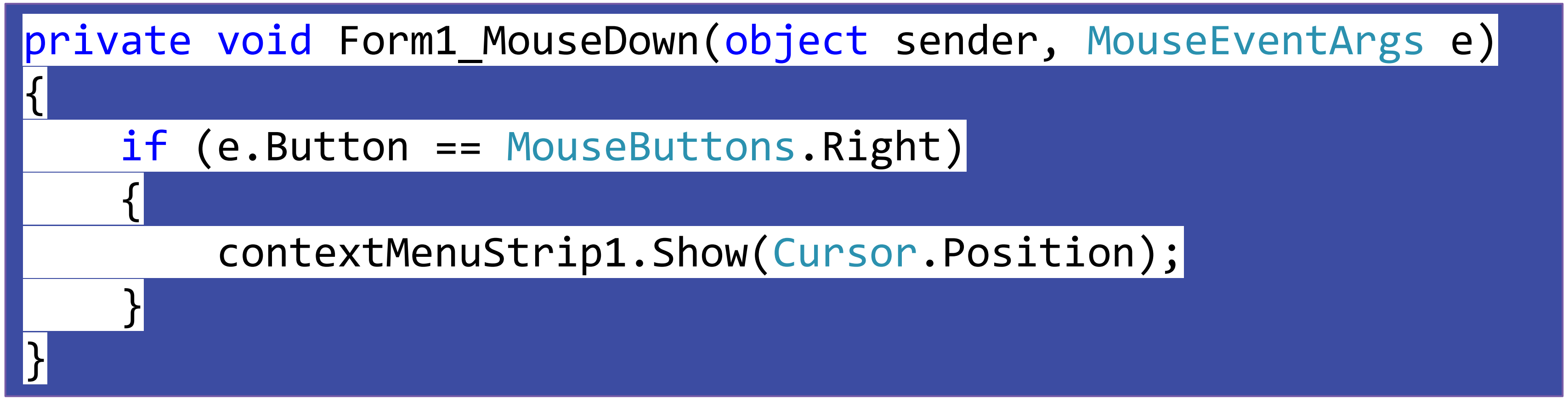


RightToLeft	No
RightToLeftAutoMir	False
ShortcutKeyDisplayS	
ShortcutKeys	**Ctrl+N**

Context Menu

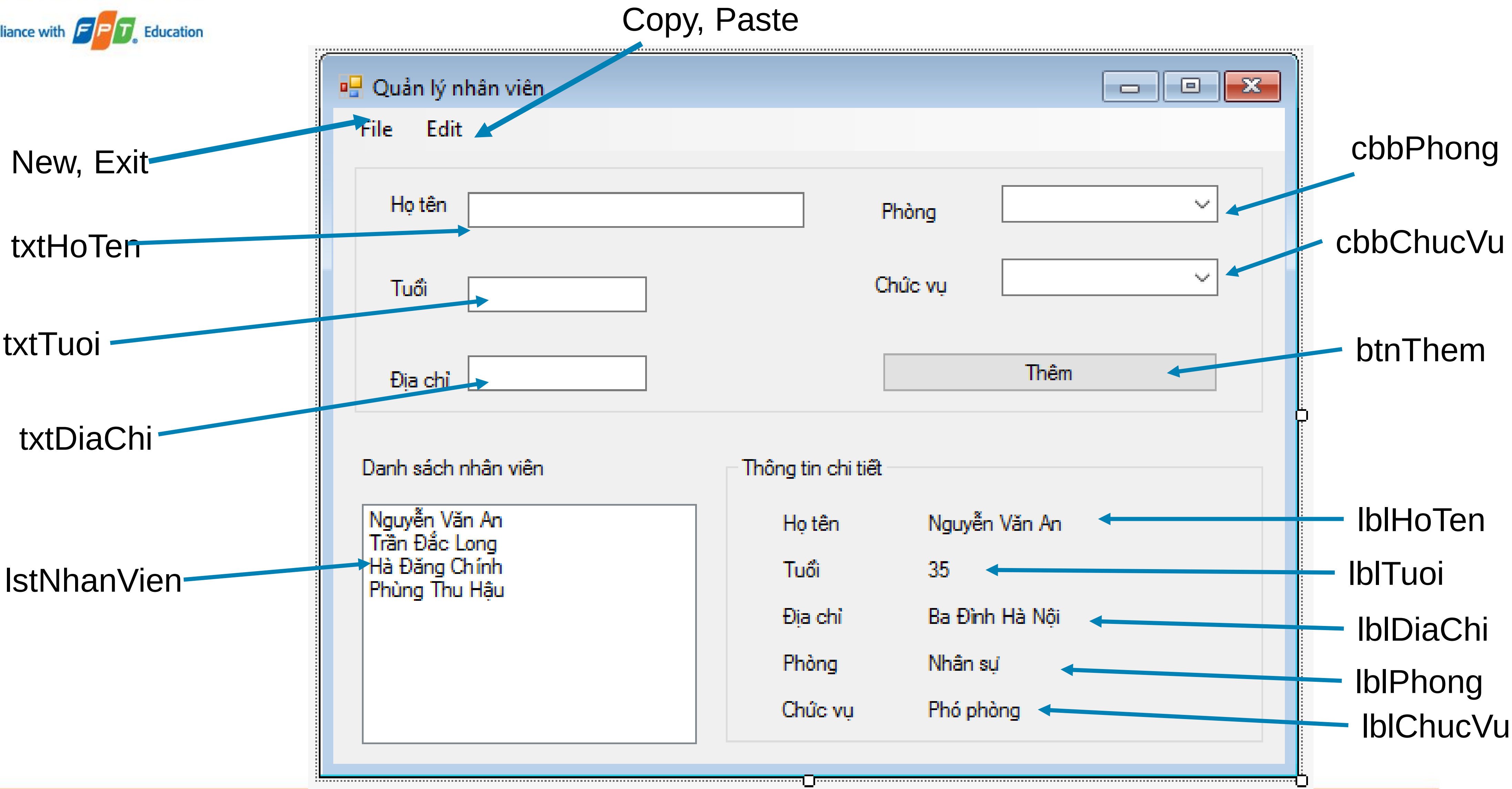
- Properties: Items (Text, ShotcutKeys)
- Event: Click (for each Item)





```
private void Form1_MouseDown(object sender, MouseEventArgs e)
{
    if (e.Button == MouseButtons.Right)
    {
        contextMenuStrip1.Show(Cursor.Position);
    }
}
```

DEMO



Copy, Paste

New, Exit

txtHoTen

txtTuoi

txtDiaChi

lstNhanVien

cbbPhong

cbbChucVu

btnThem

lblHoTen

lblTuoi

lblDiaChi

lblPhong

lblChucVu

Họ tên

Tuổi

Địa chỉ

Phòng

Chức vụ

Danh sách nhân viên

- Nguyễn Văn An
- Trần Đắc Long
- Hà Đăng Chính
- Phùng Thu Hậu

Thông tin chi tiết

Họ tên	Nguyễn Văn An
Tuổi	35
Địa chỉ	Ba Đình Hà Nội
Phòng	Nhân sự
Chức vụ	Phó phòng