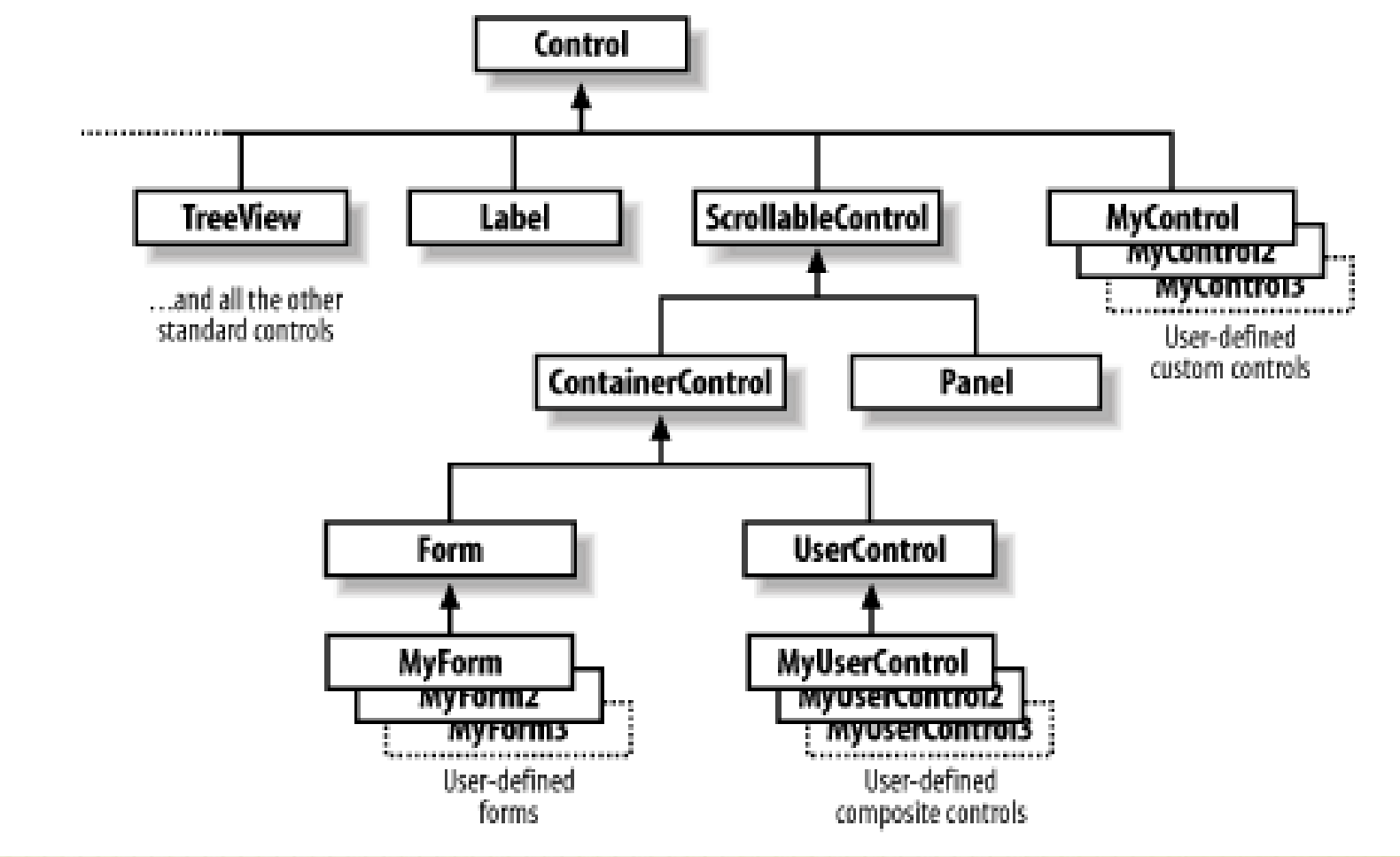
Lập trình GUI

Lập trình GUI

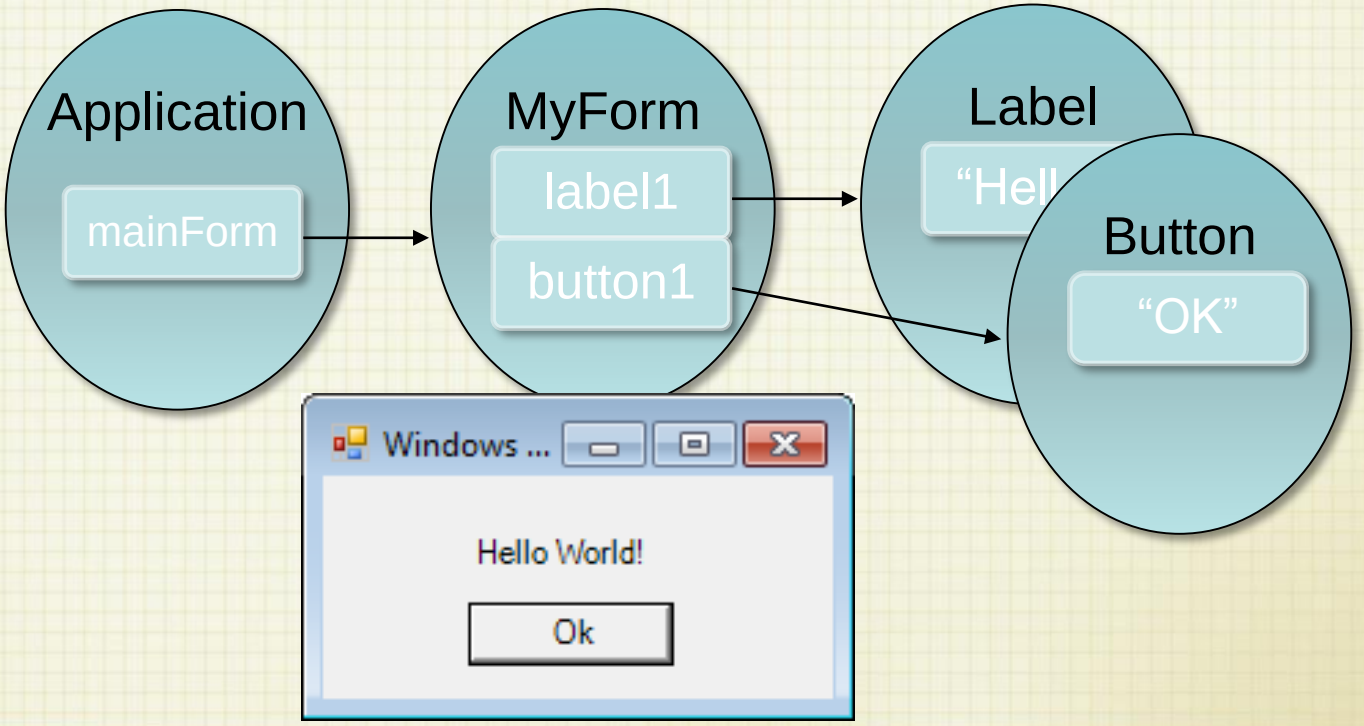
- User interface modeling
- User interface architecture
- User interface coding
- HCI

The Control class hierarchy

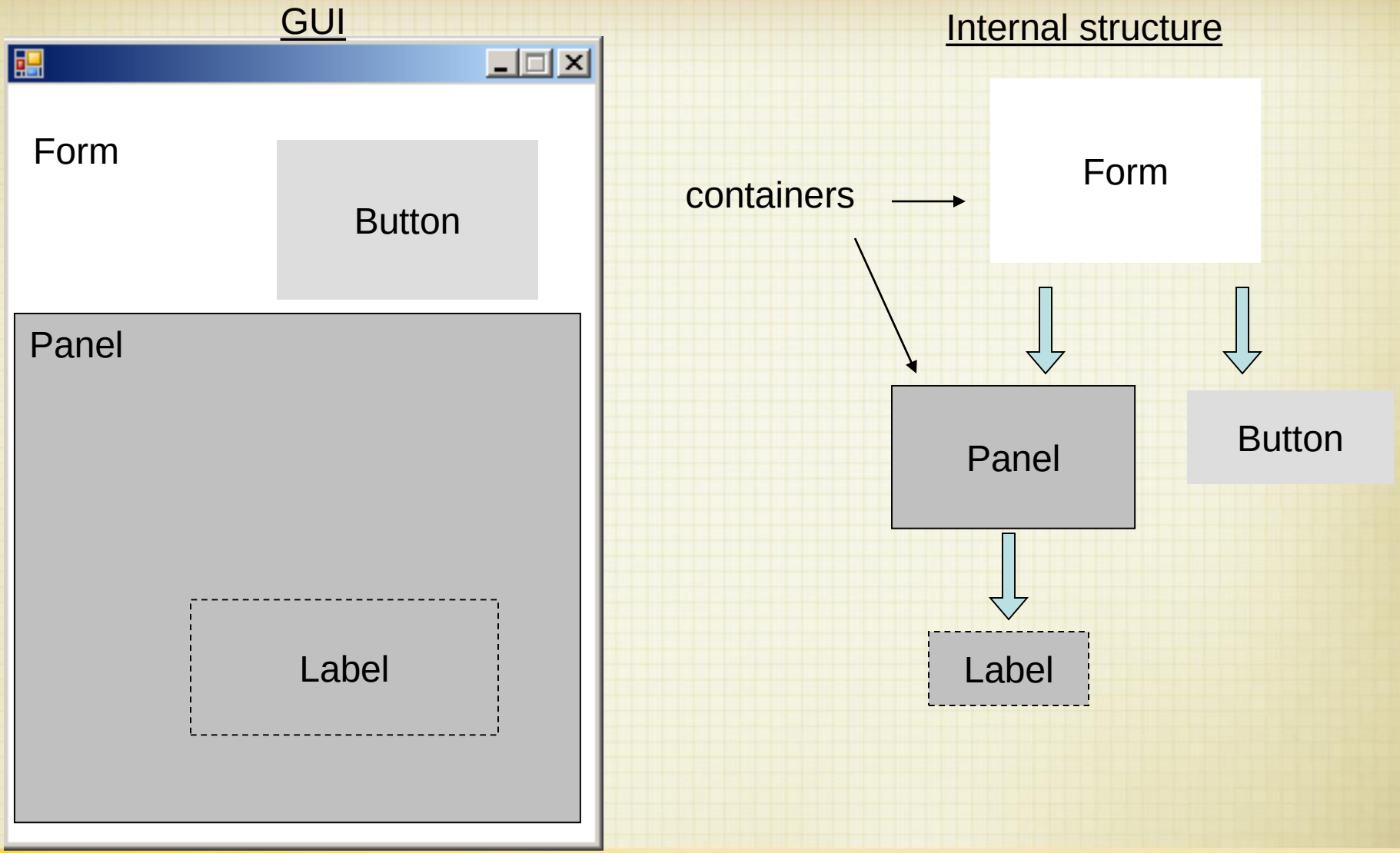


Windows Forms Application Structure

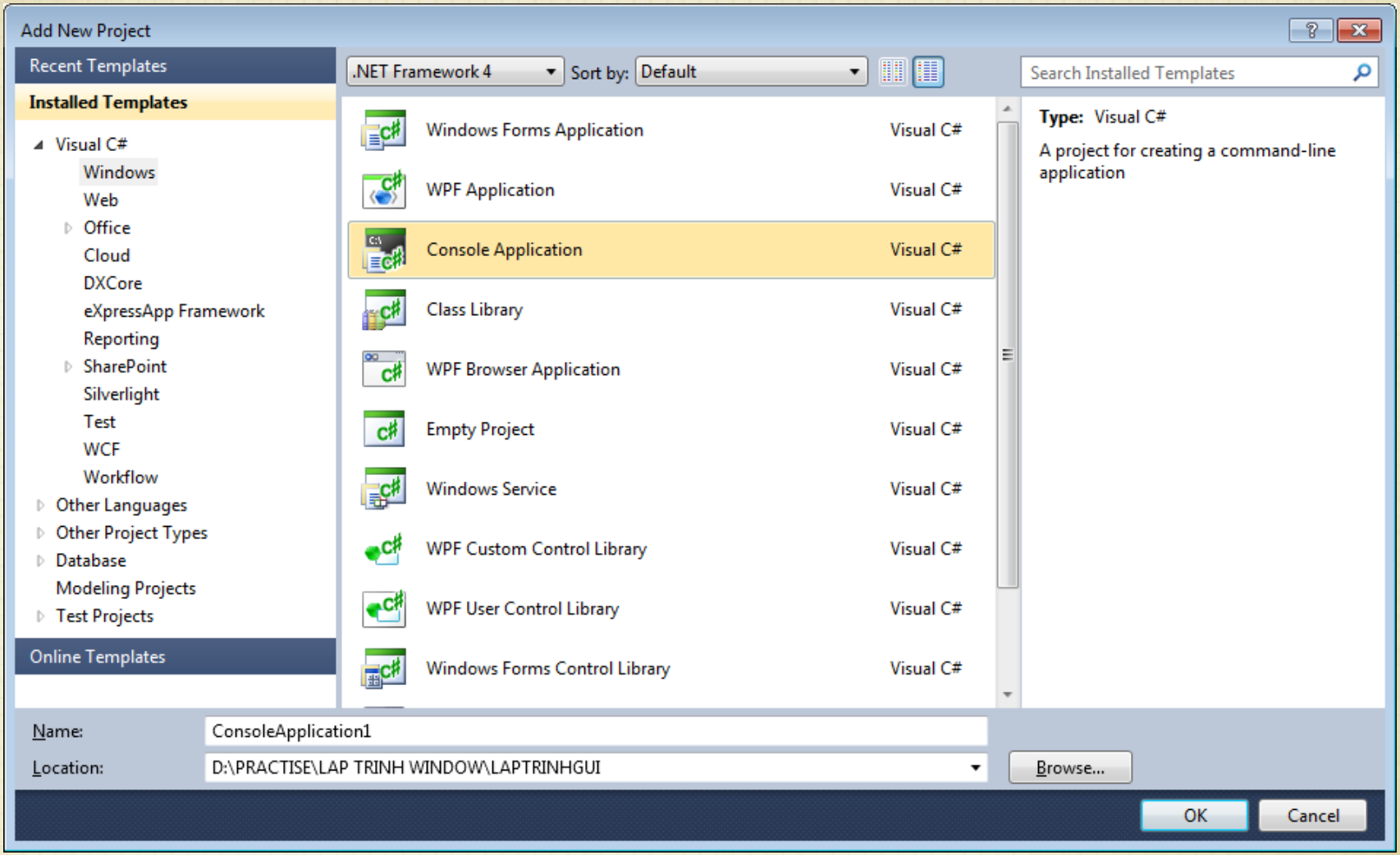
- A Windows Forms application has three pieces
  - the application itself
  - forms in the application
  - controls on the form



GUI Tree Structure

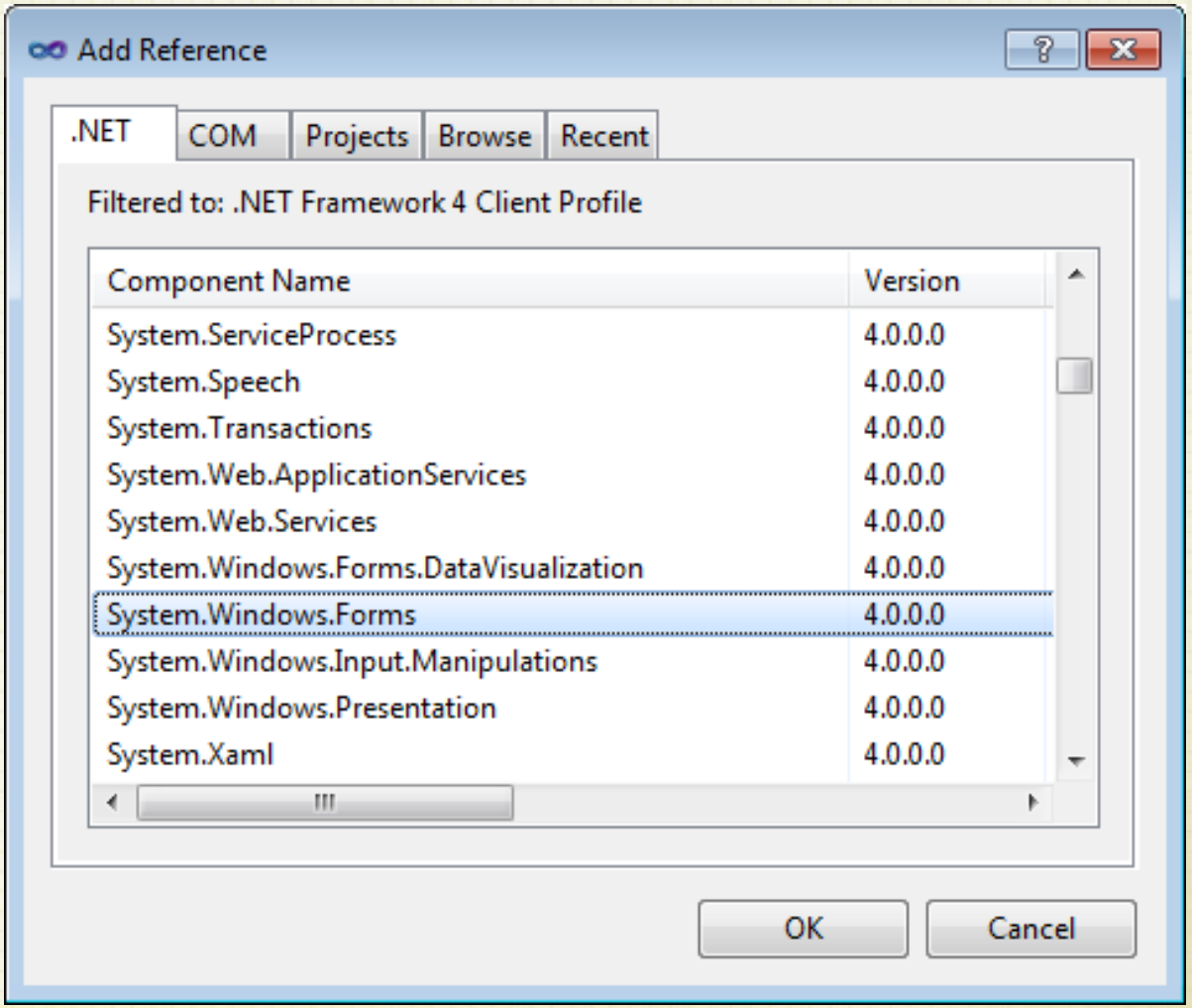


Cách tạo WinForm bằng Console Application



Cách tạo WinForm bằng Console Application

- Project → Add Reference

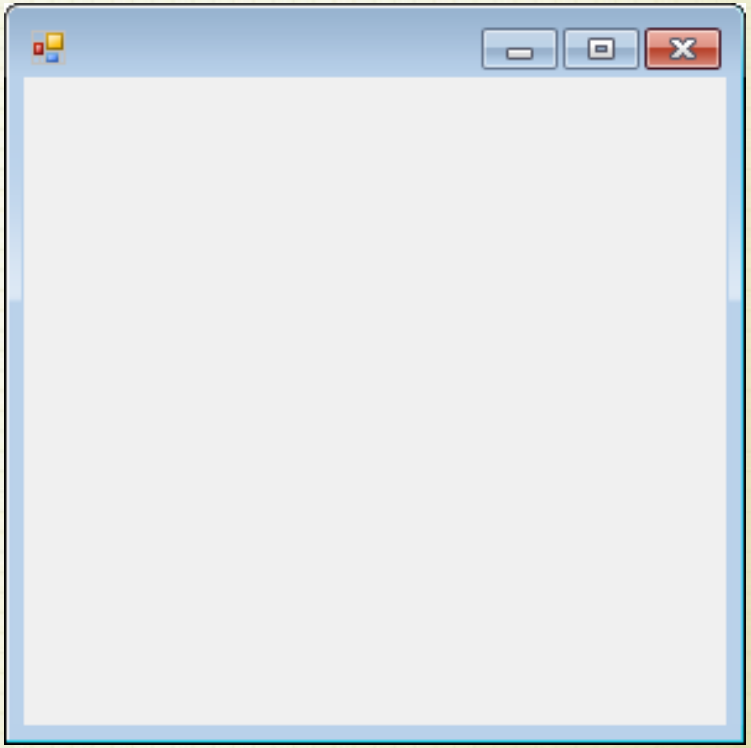


Form

- Một « form » là một cửa sổ màn hình - một đơn vị giao diện người dùng do Microsoft đưa ra kể từ Windows 1.0
- Một ứng dụng Windows Forms (WinForms) phải có ít nhất một cửa sổ « main form » (cửa sổ chính
- Form có thể chứa các component
- Form có thể có các file resource

Ví dụ 1

```
class Program
    {
        static void Main(string[] args)
        {
            Form f = new Form();
            Application.Run(f);
        }
    }
```



Ví dụ 2

```
class Program
    {
        static void Main(string[] args)
        {
            MessageBox.Show("Hello World");
        }
    }
```

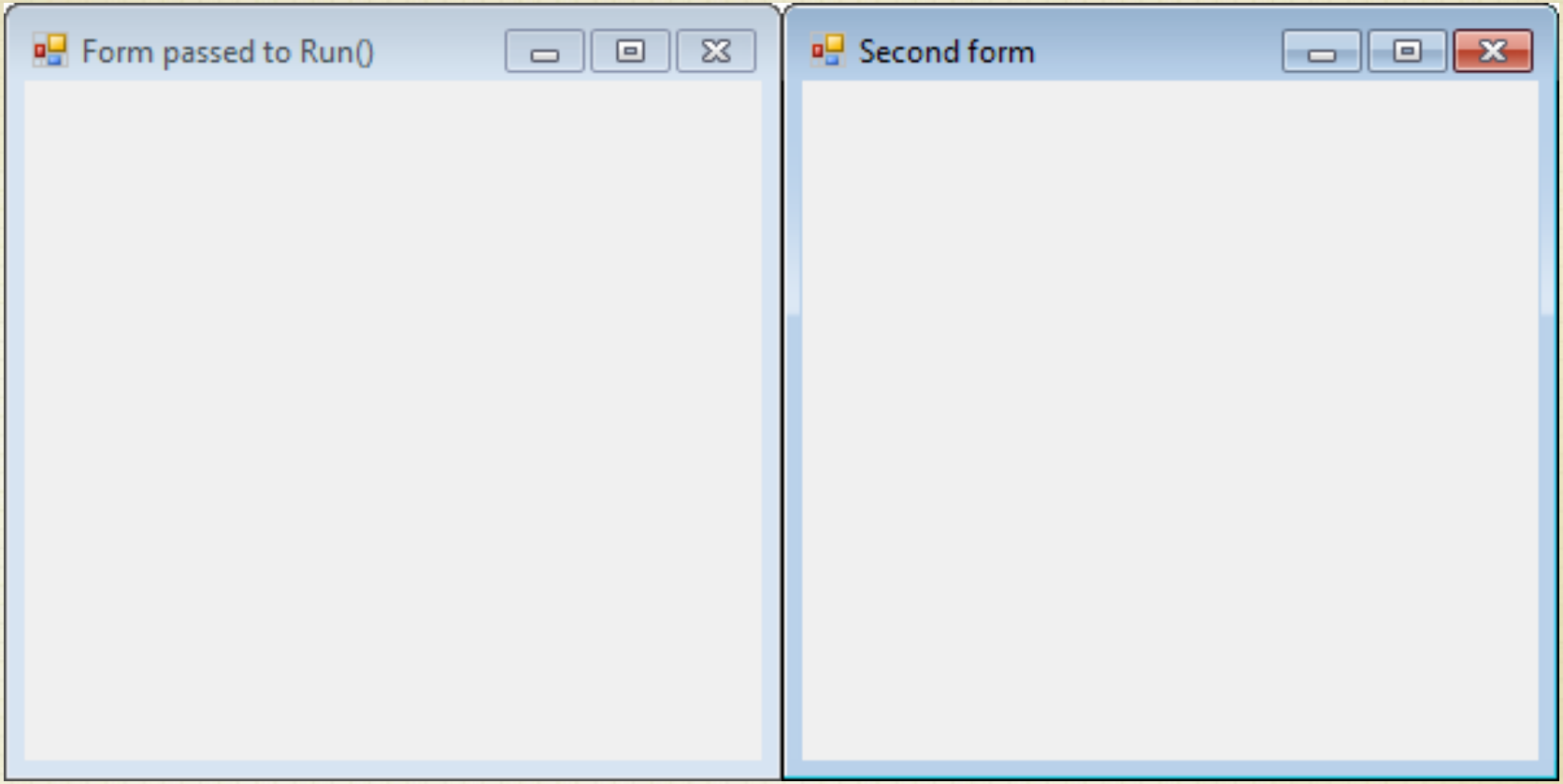
Application class

Exit	Stops all running message loops and closes all windows in the application. Note that this may not force the application to exit
Run	Starts a standard message loop on the current thread. If a Form is given, also makes that form visible.
DoEvents	Processes any Windows messages currently in the message queue.

Ví dụ 3

```
public static void Main()
{
        Form form1 = new Form();
        Form form2 = new Form();

        form1.Text = "Form passed to Run()";
        form2.Text = "Second form";
        form2.Show();

        Application.Run(form1);
        MessageBox.Show("Application.Run() has returned
                         control back to Main. Bye,
                         bye!", "TwoForms");
}
```

Ví dụ 3



Form Properties

Thuộc tính	Kiểu	Mô tả
FormBorderStyle	FormBorderStyle: FixedDialog, Fixed3D…	Kiểu đường viền
ControlBox	bool	Có system menu box?
MaximizeBox	bool	
MinimizeBox	bool	
Icon	Icon	
ShowInTaskBar	bool	
StartPosition	FormStartPosition	

Form Properties

Thuộc tính	Kiểu	Mô tả
SizeGripStyle	SizeGripStyle: Show, Hide…	
WindowState	FormWindowState: Normal, Maximized, Minimized	
TopMost	bool	
Text	string	
Size	Point	
ForeColor	color	
Font	font	
Location	Point	

Form Properties

Thuộc tính	Kiểu	Mô tả
AcceptButton		
CancelButton		

StartPosition - FormBorderStyle

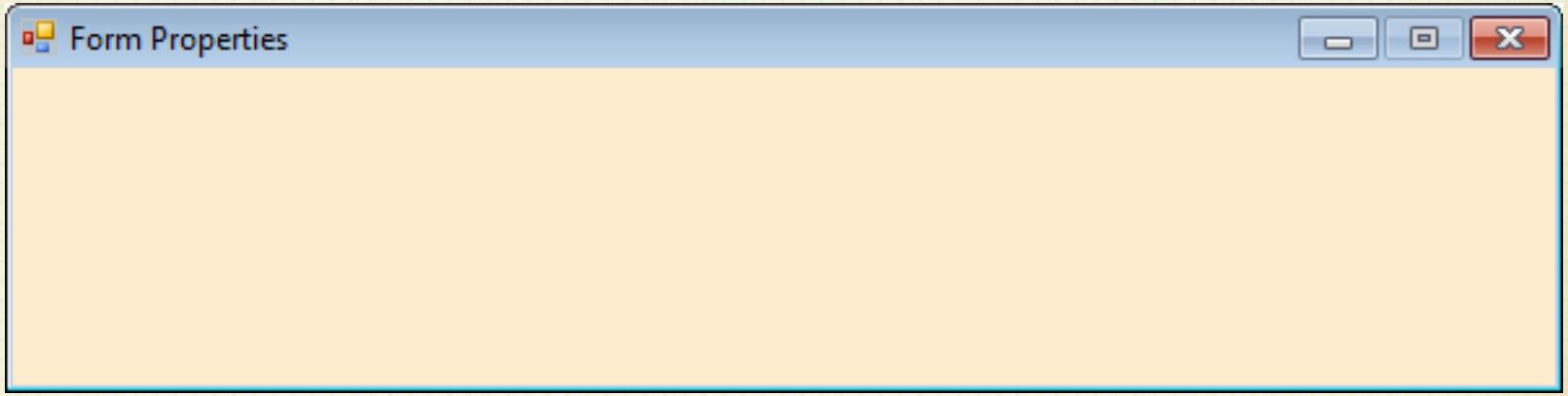
- **CentreParent** cho modal dialogs
- **CentreScreen** cho main form hay splash screen
- **WindowsDefaultLocation**

- **FixedDialog** : modal dialog boxes
- **FixedSingle** : main form
- **None** : splash screen
- **Sizable**

Ví dụ 4

```
static void Main(string[] args)
{
      Form form = new Form();

      form.Text = "Form Properties";
      form.BackColor = System.Drawing.Color.BlanchedAlmond;
      form.Width *= 2;
      form.Height /= 2;
      form.FormBorderStyle = FormBorderStyle.FixedSingle;
      form.MaximizeBox = false;
      form.Cursor = Cursors.Hand;
      form.StartPosition = FormStartPosition.CenterScreen;

      Application.Run(form);
}
```

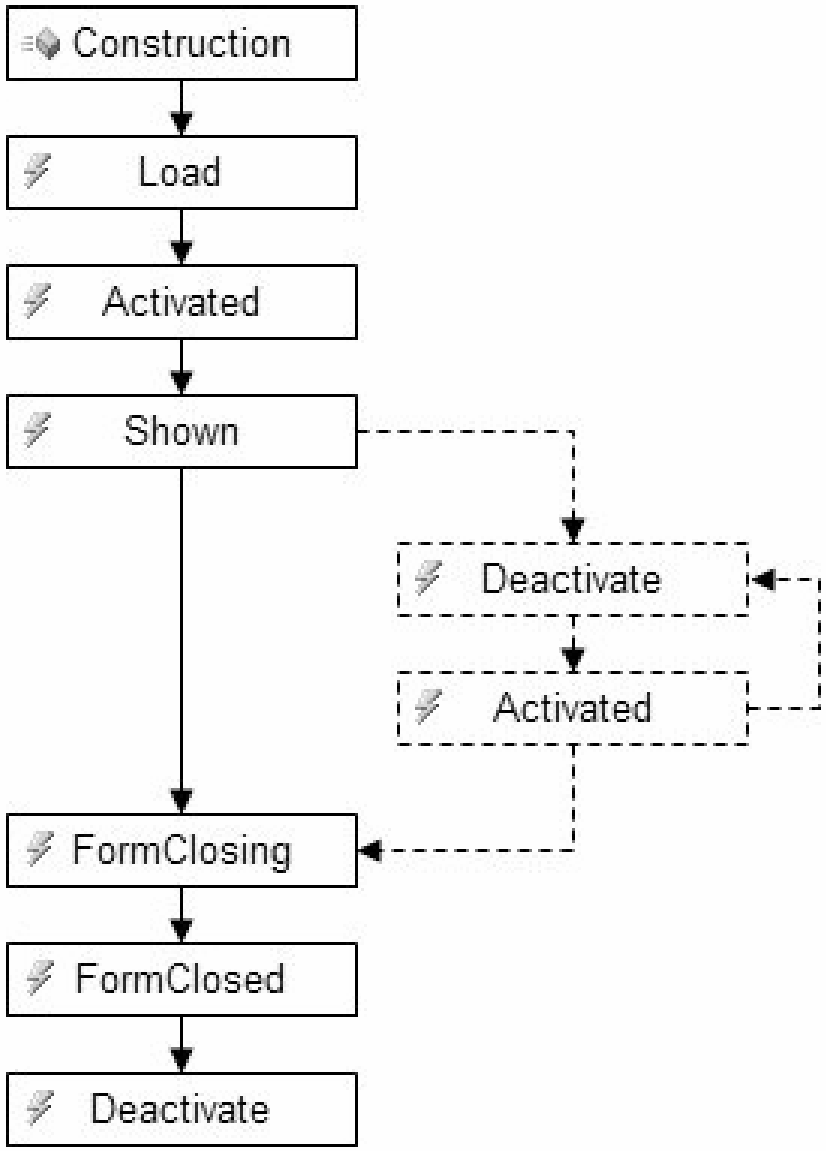
Ví dụ 4



Form Method

- Show()
- ShowDialog();
- Hide(); ytui
- Close();

Form Lifetime Event Sequence



Form Event

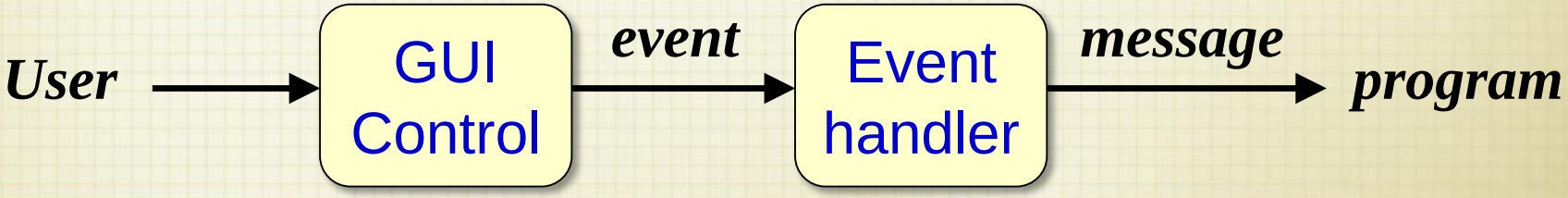
- Click
- DoubleClick
- KeyDown
- MouseHover
- Paint
- Resize
- ……

Sự kiên form Load

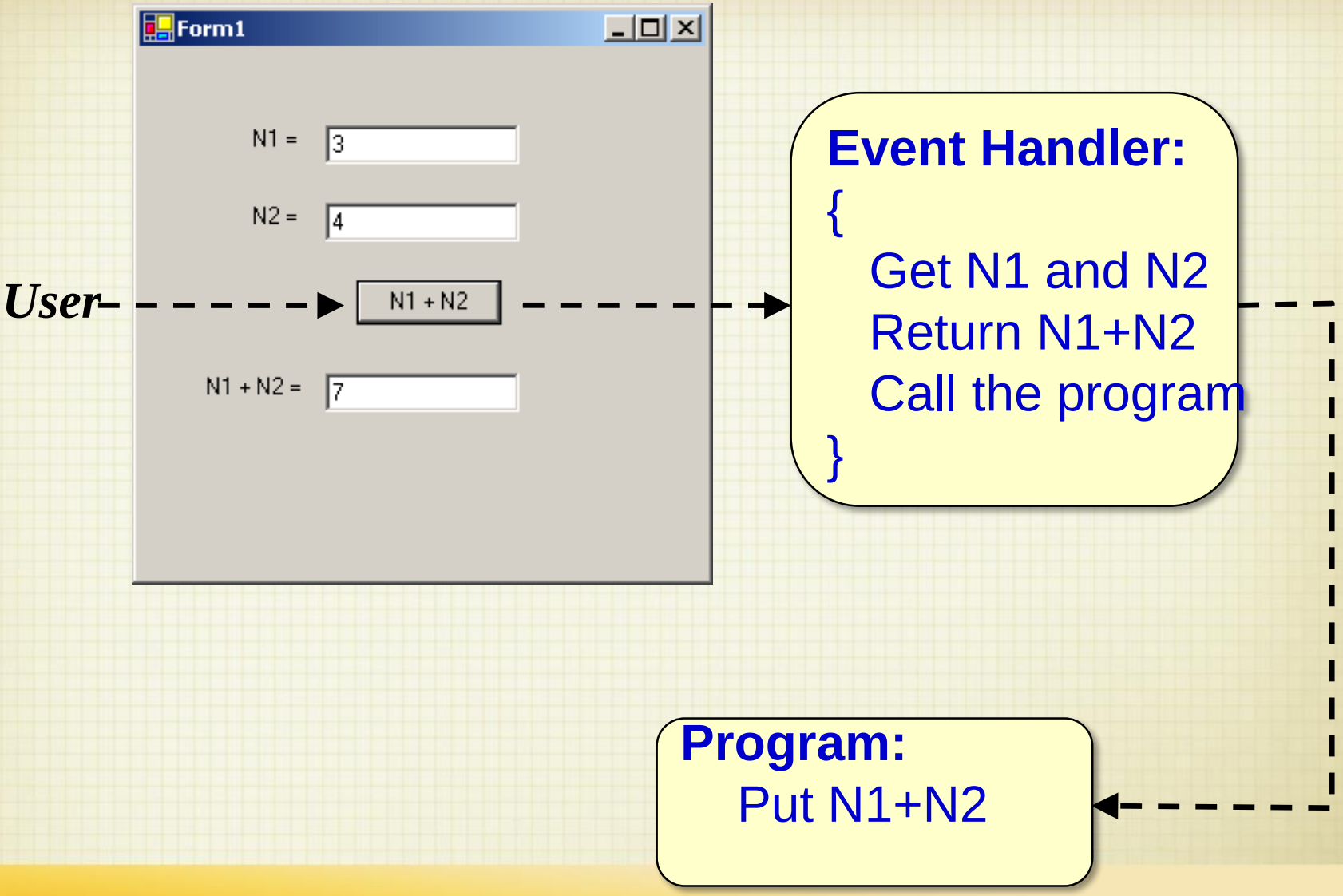
```
class Program
   {
            static void Main(string[] args)
           {
                Form f = new Form();
                f.Load += new EventHandler(f_Load);
                Application.Run(f);
         }
       private static void f_Load(object sender, EventArgs e)
       {
           MessageBox.Show("Hello ");
       }
      }
```

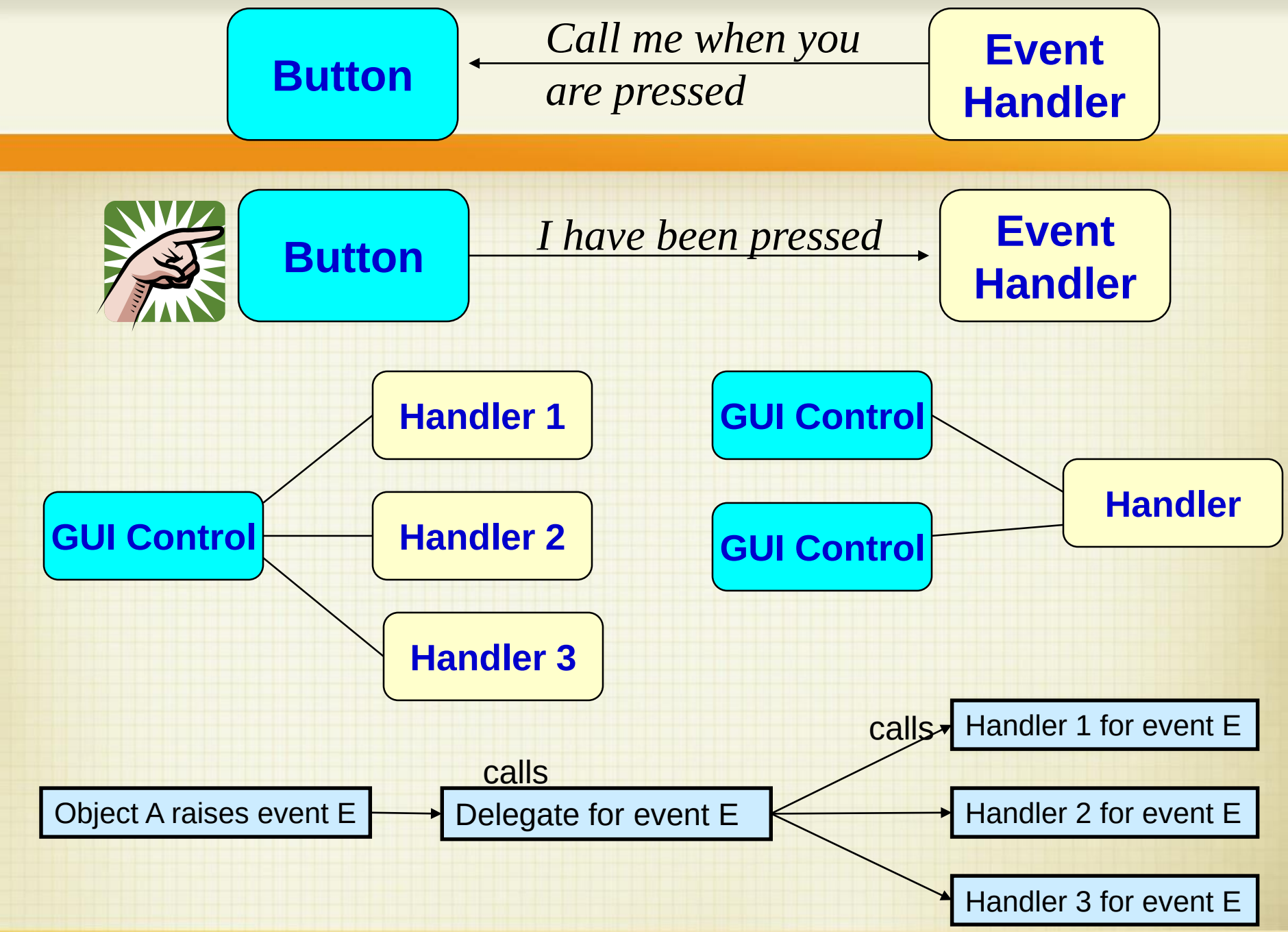
Events

- Một *event* là một đối tượng biểu diễn một hành động
- Ví dụ:
  - The mouse is moved or button clicked
  - The mouse is dragged
  - A graphical button is clicked
  - A keyboard key is pressed
  - A timer expires
- Sự kiện thường tương ứng với thao tác của người dùng
- Có thể viết các bộ đáp ứng sự kiện

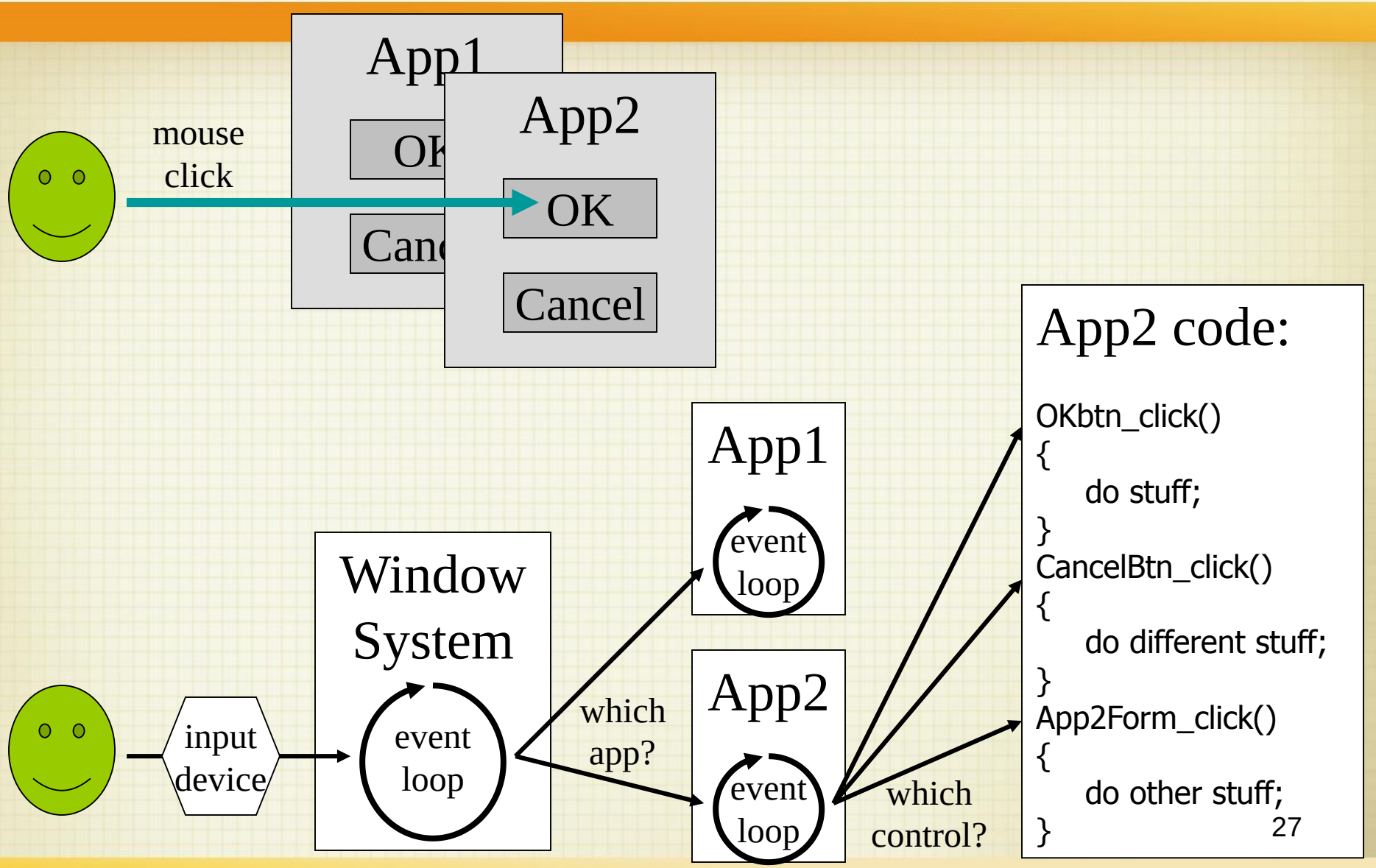


Events


Form1
N1 =
3
N2 =
4
N1 + N2
N1 + N2 =
7
User
Event Handler:
{
Get N1 and N2
Return N1+N2
Call the program
}
Program:
Put N1+N2


Button
Call me when you are pressed
Event Handler
Button
I have been pressed
Event Handler
GUI Control
Handler 1
Handler 2
Handler 3
GUI Control
GUI Control
Handler
Object A raises event E
calls
Delegate for event E
calls
Handler 1 for event E
Handler 2 for event E
Handler 3 for event E

GUI Events


App1
OK
Canc
App2
OK
Cancel
mouse
click
App1
event
loop
Window
System
input
device
event
loop
which
app?
App2
event
loop
which
control?
App2 code:
OKbtn_click()
{
do stuff;
}
CancelBtn_click()
{
do different stuff;
}
App2Form_click()
{
do other stuff;
}

GUI program

- User input commands
- Non-linear execution
- Unpredictable order
- Much idle time
- Event callback procs

GUI program:

```
main()
{
      decl data storage;
      initialization code;

      create GUI;
      register callbacks;

      main event loop;
}

Callback1()   //button1 press
{     code;
}
Callback2()   //button2 press
{     code;
}
…
```

C# WinApp

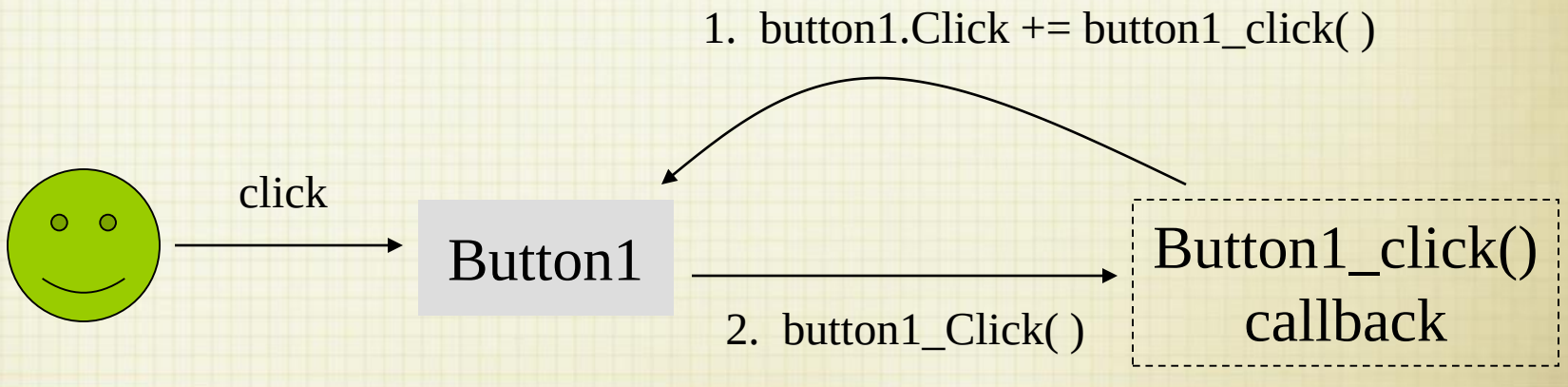
- “delegates” = callbacks
- Function pointers
- Listeners

C# WinApp:

```
Class{
  decl data storage;

  constructor(){
      initialization code;
      create GUI controls;
      register callbacks;
  }
  main(){
      Run(new )
  }
  callback1(){
      do stuff;
  }
  callback2(){
      do stuff;
  }
...
```

Delegates

1. Đăng ký control để nhận events
   - Gắn vào Control một function pointer để gọi callback function
   - **F.Load += new EventHandler(MyLoadHandler);**
2. Nhận events từ control
   - Control sẽ gọi function pointer
   - **private void button1_Click(object sender, EventArgs e){**



Event Handler

- Thông điệp gửi đi bằng cách chuyển giao.
- Bộ xử lý sự kiện(Event Handler) sẽ được gọi khi sự kiện tương ứng phát sinh

void EventMethodName(Object sender, EventArgs e)

Paint Event

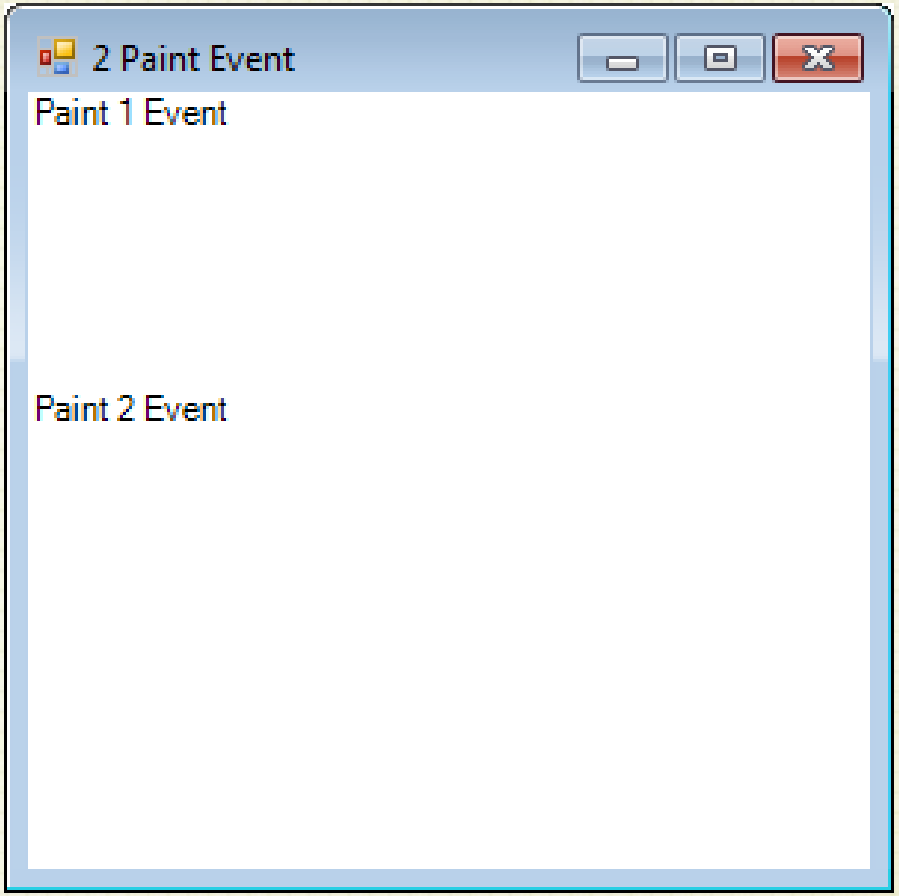
```
class Program
   {
       static void Main(string[] args)
       {
           Form f = new Form();
          f.Click+=new EventHandler(f_Click);
           Application.Run(f);

       }
       static void f_Click(Object sender, EventArgs e) {
           Form f = (Form)sender;
           Graphics gx = f.CreateGraphics();
           gx.DrawString("Form 1 \n Form 1\n", f.Font, Brushes.Black, 30, 30);
       }
 }
```

Paint Event

```
class Program
   {
       static void Main(string[] args)
       {
           Form f = new Form();
          f.Click+=new EventHandler(f_Click);
           Application.Run(f);


       }
       static void f_Click(Object sender, EventArgs e) {
           Form f = (Form)sender;
           Graphics gx = f.CreateGraphics();
           gx.DrawString("Form 1 \n Form 1\n", f.Font, Brushes.Black, 30, 30);
       }
 }
```

```
static void Main(string[] args)
{
        Form f1 = new Form();
        f1.Text = "2 Paint Event";
        f1.BackColor=Color.White;
        f1.Paint += new PaintEventHandler(f1_Paint1);
        f1.Paint += new PaintEventHandler(f1_Paint2);
        Application.Run(f1);
}

static void f1_Paint1(Object sender, PaintEventArgs pea)
{
        Form f = (Form)sender;
        Graphics g = pea.Graphics;
        g.DrawString("Paint 1 Event ", f.Font, Brushes.Black, 0, 0);
}
static void f1_Paint2(Object sender, PaintEventArgs pea)
{
        Form f = (Form)sender;
        Graphics g = pea.Graphics;
        g.DrawString("Paint 2 Event ", f.Font, Brushes.Black, 0, 100);
}
```

Paint Event



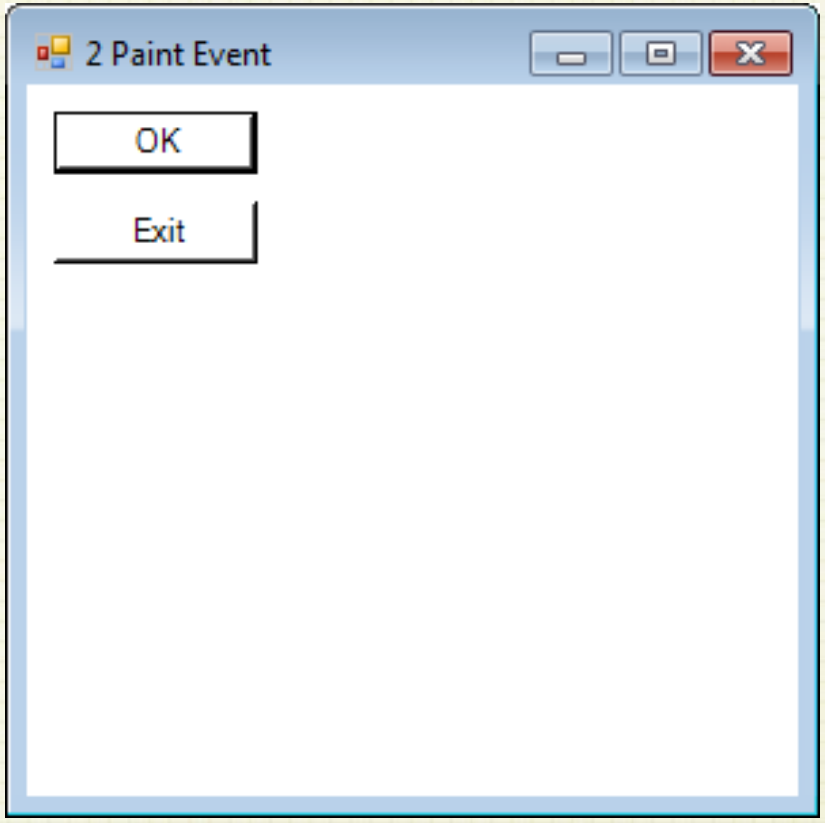
Thêm control

```
static void Main(string[] args)
        {
            Form f1 = new Form();
            Button b = new Button();
            b.Text = "OK";
            b.Click+=new EventHandler(b_Click);
            b.Location = new Point(10, 10);
            Button b1 = new Button();
            b1.Text = "Exit";
            b1.Click += new EventHandler(b1_Click);
            b1.Location= new Point(b.Left, b.Height + b.Top + 10);
            f1.Controls.Add(b);
            f1.Controls.Add(b1);
            f1.Text = "2 Paint Event";
            f1.BackColor=Color.White;
            f1.AcceptButton = b;
            f1.CancelButton = b1;
            Application.Run(f1);
        }
```

Thêm control

```
static void b_Click(Object sender, EventArgs e)
{
        MessageBox.Show("Hello World");
}
static void b1_Click(Object sender, EventArgs e)
{
       Application.Exit();
}
```

Thêm control



Kế thừa Form

```
class Myform:System.Windows.Forms.Form
    {

        public Myform()
        {
            Text = "My Form Class";
        }
    }
```

```
static void Main(string[] args)
        {
            Myform f=new Myform();
            Application.Run(f);
        }
```

Kế thừa Form

```
class Myform:System.Windows.Forms.Form
   {

      public Myform()
      {
         Text = "My Form Class";
      }
      protected override void OnPaint(PaintEventArgs pea)
      {
         Graphics g=pea.Graphics;
         g.DrawString("Hello World", Font, Brushes.Red,20,20);
      }
   }
```

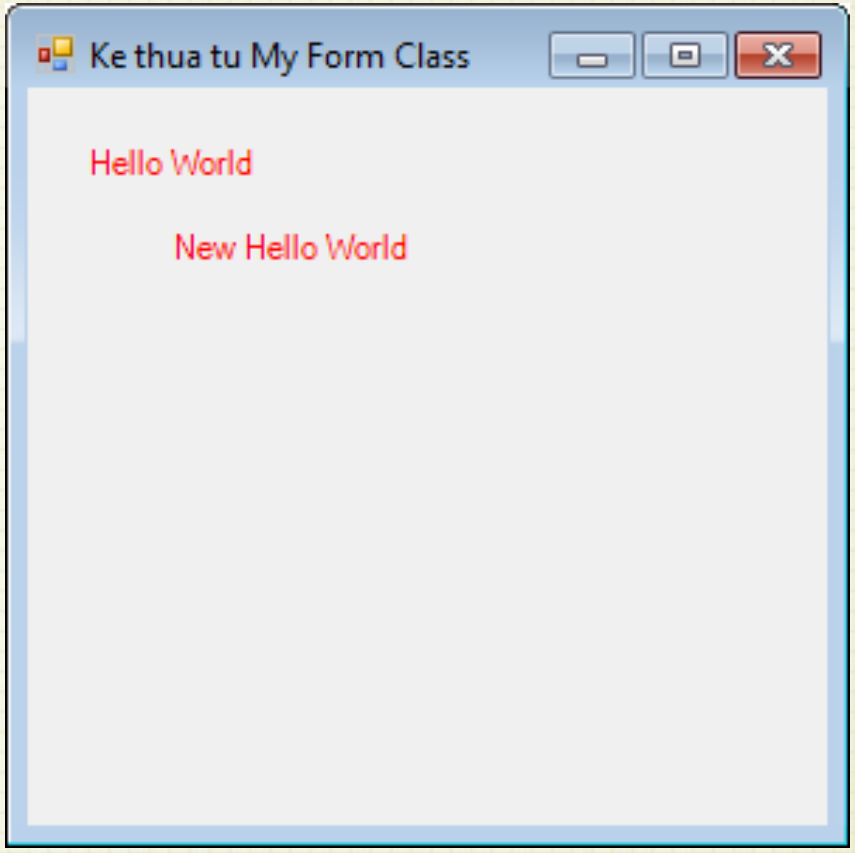
Kế thừa Form

```
class Program
    {
        static void Main(string[] args)
        {
            Myform f=new Myform();
            f.Text = "Ke thua tu " + f.Text;
            f.Paint+=new PaintEventHandler(f_Paint);
            Application.Run(f);
        }
        static void f_Paint(Object sender, PaintEventArgs pea)
        {
            Form form = (Form)sender;
            Graphics g = pea.Graphics;
            g.DrawString("New Hello World", form.Font, Brushes.Red, 50, 50);

        }
    }
```

Kế thừa Form

```
class Myform:System.Windows.Forms.Form
   {

       public Myform()
       {
           Text = "My Form Class";
       }
       protected override void OnPaint(PaintEventArgs pea)
       {
           base.OnPaint(pea);
           Graphics g=pea.Graphics;
           g.DrawString("Hello World", Font, Brushes.Red,20,20);
      }
   }
```

Kế thừa Form



MessageBox.Show

MessageBox.Show (String strText)
MessageBox.Show (String strText, String strCaption)
MessageBox.Show (String strTex, String strCaption, MessageBoxButtons mbb)
MessageBox.Show (String strTex, String strCaption, MessageBoxButtons mbb, MessageBoxIcon mbi)
MessageBox.Show (String strTex, String strCaption, MessageBoxButtons mbb, MessageBoxIcon mbi, MessageBoxDefaultButton mbdb)
MessageBox.Show (String strTex, String strCaption, MessageBoxButtons mbb, MessageBoxIcon mbi, MessageBoxDefaultButton mbdb, MessageBoxOptions mbo)

MessageBox Buttons

Member	Value
Ok	0
OkCancel	1
AbortRetryIgnore	2
YesNoCancel	3
YesNo	4
RetryCancel	5

MessageBox Icon

Member	Value
None	0x00
Hand	0x10
Stop	0x10
Error	0x10
Question	0x20
Exclamation	0x30
Warning	0x30
Asterisk	0x40
Information	0x40

Form Controls

- Là đơn vị cơ sở để tạo nên giao diện người dùng trong lập trình WinForm.
- Là bất kỳ đối tượng nào nằm trong vùng chứa của Container có khả năng tương tác với người sử dụng.
- Là đối tượng dùng để nhận dữ liệu được nhập vào hoặc xuất dữ liệu trên window form
- Các control có các đặc điểm, các phương thức và các sự kiện riêng cho control đó

Thuộc tính chung

Properties
BackColor
CanFocus
Enabled
ForeColor
Name
Text
Visible

Các lớp cơ sở

- ***System.Windows.Forms.Control*** -chứa chức năng cơ bản của thao tác xử lý bàn phím và nhập từ chuột và xử lý tin nhắn window.
- ***System.Windows.Forms.ButtonBase*** - Lớp này hỗ trợ chức năng cơ bản của một nút
- ***System.Windows.Forms.TextBoxBase*** - cung cấp chức năng và thuộc tính thông thường cho các lớp thừa hưởng. Cả hai lớp TextBox và RichTextBox sử dụng chức năng cung cấp bởi TextBoxBase.
- ***System.Windows.Forms.ScrollableControl*** - quản lý sự phát sinh và hiển thị của các thanh cuộn đến người dùng để truy cập đến gốc của một hiển thị.
- ***System.Windows.Forms.ContainerControl*** - Lớp này quản lý chức năng yêu cầu cho một control để hành động
- ***System.Windows.Forms.Panel*** - có thể chứa các control thêm vào, nhưng khác với lớp *ContainerControl*, nó phân loại các control một cách đơn giản.
- ***System.Windows.Forms.Form*** - Tạo bất kỳ loại cửa sổ nào: standard, toolbox, borderless, modal dialog boxes và multi-document interfaces.
- ***System.Windows.Forms.UserControl*** - tạo một custom control đến việc được dùng trong một nơi phức tạp trong một ứng dụng hay tổ chức

STANDARD CONTROL

- Một đối tượng control kế thừa trực tiếp/ gián tiếp từ System.Windows.Forms.Control
- Có các loại:
  - Action control: Button, Toolbar, MenuBar, ContextMenu
  - Value control: Label, TextBox, PictureBox
  - List control: ListBox, ComboBox, DataGrid, TreeView,
  - Container control: GroupBox, Panel, ImageList, …
  - Dialogs:OpenFileDialog, SaveFileDialog, PrintDialog, etc

Buttons

Control	Mô tả
Button	Normal button for actions (e.g., OK or Cancel)
CheckBox	Yes/no selection button
RadioButton	Single selection from a range of choices

Time and date

Control	Mô tả
DateTimePicker	UI for specifying a date or time
MonthCalendar	UI showing a single calendar month

Labels and pictures

Control	Mô tả
GroupBox	Visual grouping for sets of related controls
Label	Text label, usually providing a name or description for some other control (e.g., a text box)
PictureBox	A picture: supports various bitmap formats (BMP, ICO, JPEG, TIFF, and PNG) and Windows metafiles
LinkLabel	Hyperlink, e.g., a URL; this effectively combines label-like and button-like behavior

Text editing

Control	Mô tả
TextBox	An editable text field (plain text only)
RichTextBox	An editable text fields supporting text with formatting (based on RTF—the Rich Text Format)
NumericUpDown	A text box containing a number, and an associated pair of up/down buttons (often known as a spin control)
DomainUpDown	Similar to a NumericUpDown, only the text box can contain any string; the up and down buttons move through a list of strings

Lists and data

Control	Mô tả
ListBox	A vertical list of selectable text items (items may also have images)
ComboBox	An editable text field with an associated drop-down list of selectable items
ListView	A list of selectable items similar to the contents of a Windows Explorer window; supports Large Icon, Small Icon, List and Details views
TreeView	A hierarchical display, similar to that used in the Folders pane of Windows Explorer
PropertyGrid	A UI for editing properties on some object; very similar to the Properties panels in Visual Studio .NET
DataGrid	A grid control showing the contents of a DataSet

Position and progress bars

Control	Mô tả
HScrollBar	A horizontal Windows scrollbar
VScrollBar	A vertical Windows scrollbar
TrackBar	A UI for selecting from a linear range of values (useful for continuous ranges such as percentages)
ProgressBar	A bar indicating what proportion of a long-running task has completed

Layout

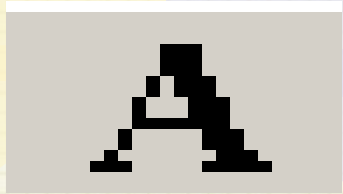
Control	Mô tả
TabControl	Allows multiple similarly sized dialogs to share a single window, with card index style tabs selecting between them—similar to those used on Properties pages in Windows Explorer
Splitter	A bar dividing two parts of a window either vertically or horizontally, allowing the proportion of space given to the two parts to be modified—similar to the divider between the Folders pane and the main pane of a Windows Explorer window
StatusBar	A bar along the bottom of the window providing textual information appropriate to the application, and a window resizing grip (most Windows applications have these)
ToolBar	A bar containing shortcut buttons to frequently used UI operations (most Windows applications have these)

Label

PROPERTIES

Image

TabStop



Methods

Hide

Show

Update

Events

Paint

TextBox

PROPERTIES

AcceptReturn

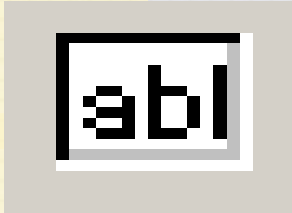
ReadOnly

Passwordchar

MaxLength

Multiline

ScrollBars



Methods

AppendText

Clear

Paste

Cut

Copy

Events

TextChanged

MultilineChanged

Button

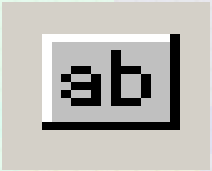
PROPERTIES

DialogResult

TextAlign

Methods

PerformClick



Events

Click

ListBox control

- **ListBox control được dùng để hiển thị danh sách các phần tử.**
- **Người dùng có thể chọn một hay nhiều phần tử từ list.**
- **Bạn có thể thêm phần tử mới vào list thông qua cửa sổ property editor hoặc là thông qua mã chương trình lúc chạy.**
- **Các thuộc tính thường gặp:**
  - SelectionMode
  - Sorted
  - SelectedIndex
  - SelectedItem

ListBox [1]

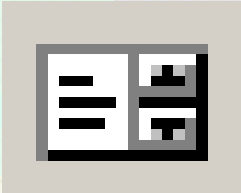
PROPERTIES

Items

MultiColumn

SelectedIndex

SelectedItem



SelectedItems

Sorted

SelectedValue

Text

ListBox [2]

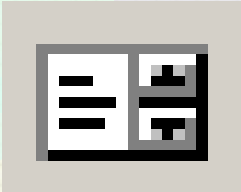
Methods

ClearSelected

GetSelected

FindString

SetSelected



Events

SelectedIndexChanged

SelectedValueChanged

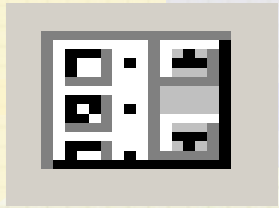
CheckedListBox

PROPERTIES

CheckedIndices

ThreeDCheckBoxes

CheckedItems



Methods

SetItemChecked

GetItemChecked

GetItemCheckState

SetItemCheckState

Events

ItemCheck

ComboBox control

- **Dùng để hiển thị danh sách các phần tử, tuy nhiên ComboBox hiển thị các danh sách này theo kiểu drop – down.**
- **ComboBox có cho phép người dùng nhập dữ liệu vào.**
- **Các phần tử trong ComboBox có thể được thêm vào thông qua property editor hoặc mã chương trình lúc chạy.**
- **Một số các thuộc tính thông dụng:**
  - Text
  - Sorted
  - SelectedIndex
  - SelectedItem

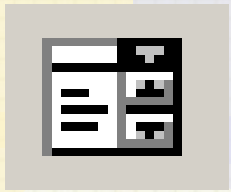
ComboBox

PROPERTIES

DropDownStyle

Focused

MaxDropDownItems



Methods

Select

SelectAll

Events

DropDown

CheckBox control

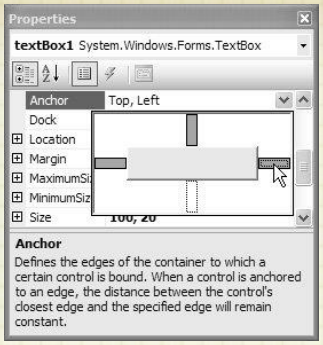
- **CheckBox control dùng để hiển thị Yes/No hay đúng/sai.**
- **Các thuộc tính thường dùng:**
  - Text
  - Checked
- **CheckBox control cho phép người dùng chọn nhiều hơn 1 lựa chọn**

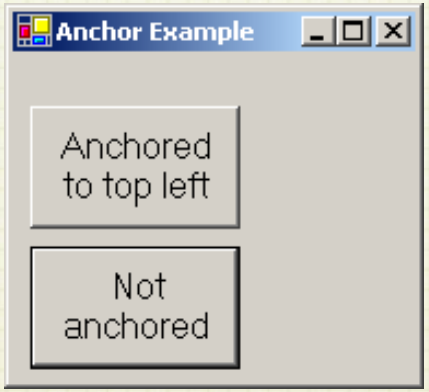
RadioButton control

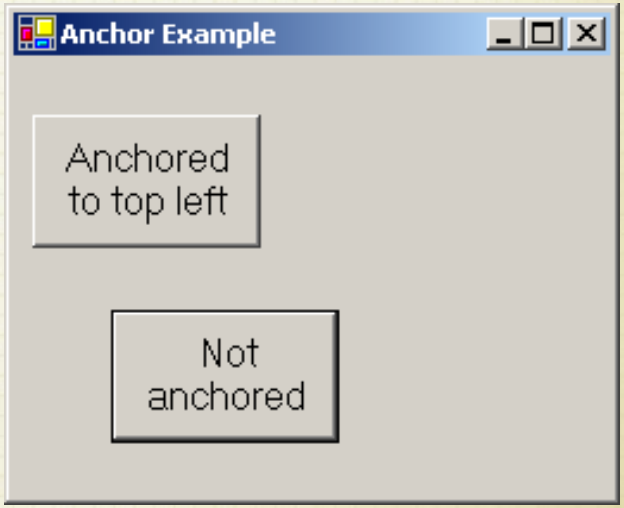
- **Dùng để cho người dùng chọn một lựa chọn.**
- **Trong một nhóm, chỉ có một RadioButton được chọn.**
- **Các thuộc tính thường được sử dụng:**
  - Text
  - Checked

KIỂU TRÌNH BÀY ĐỘNG

- Anchoring

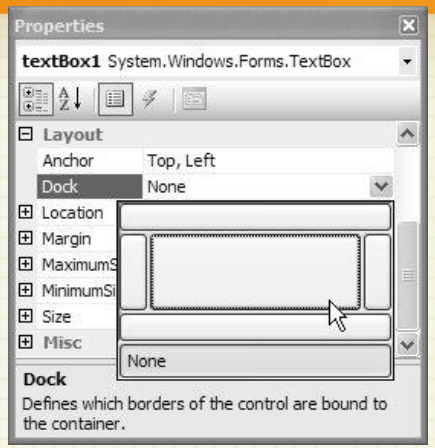


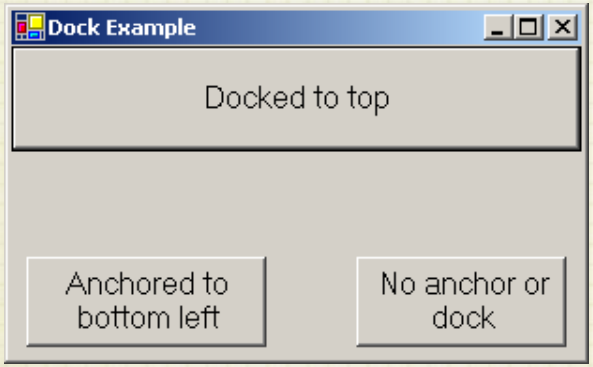


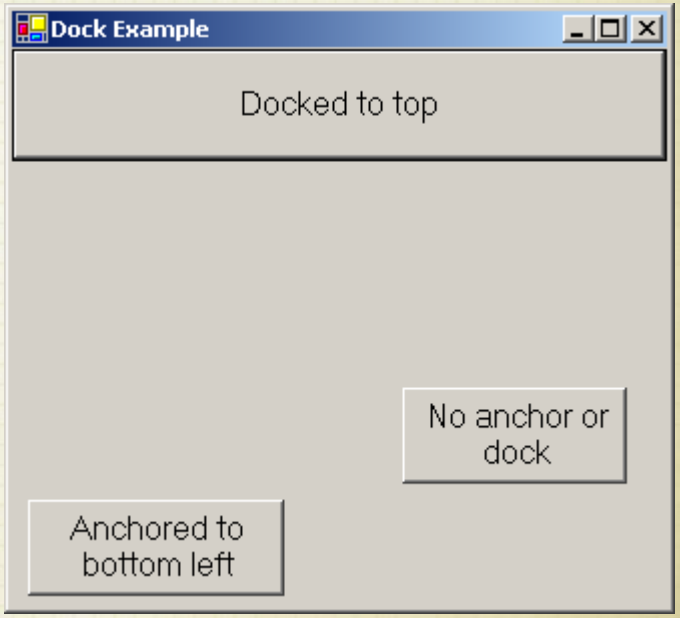


KIỂU TRÌNH BÀY ĐỘNG

- Docking

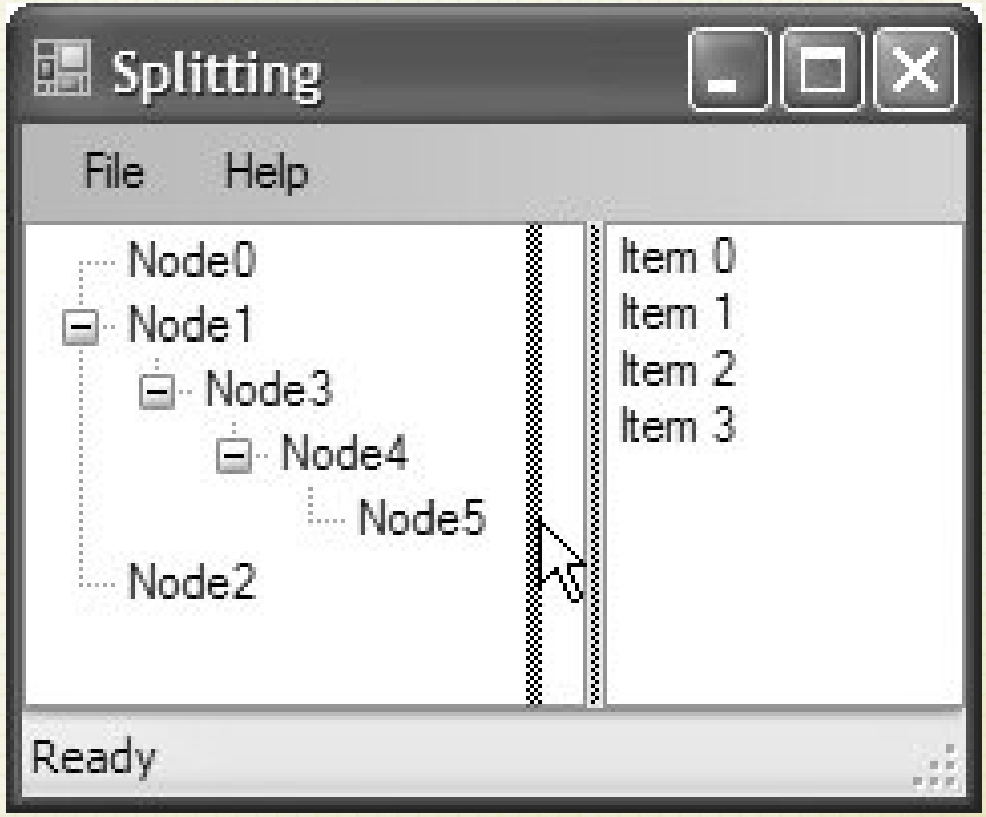






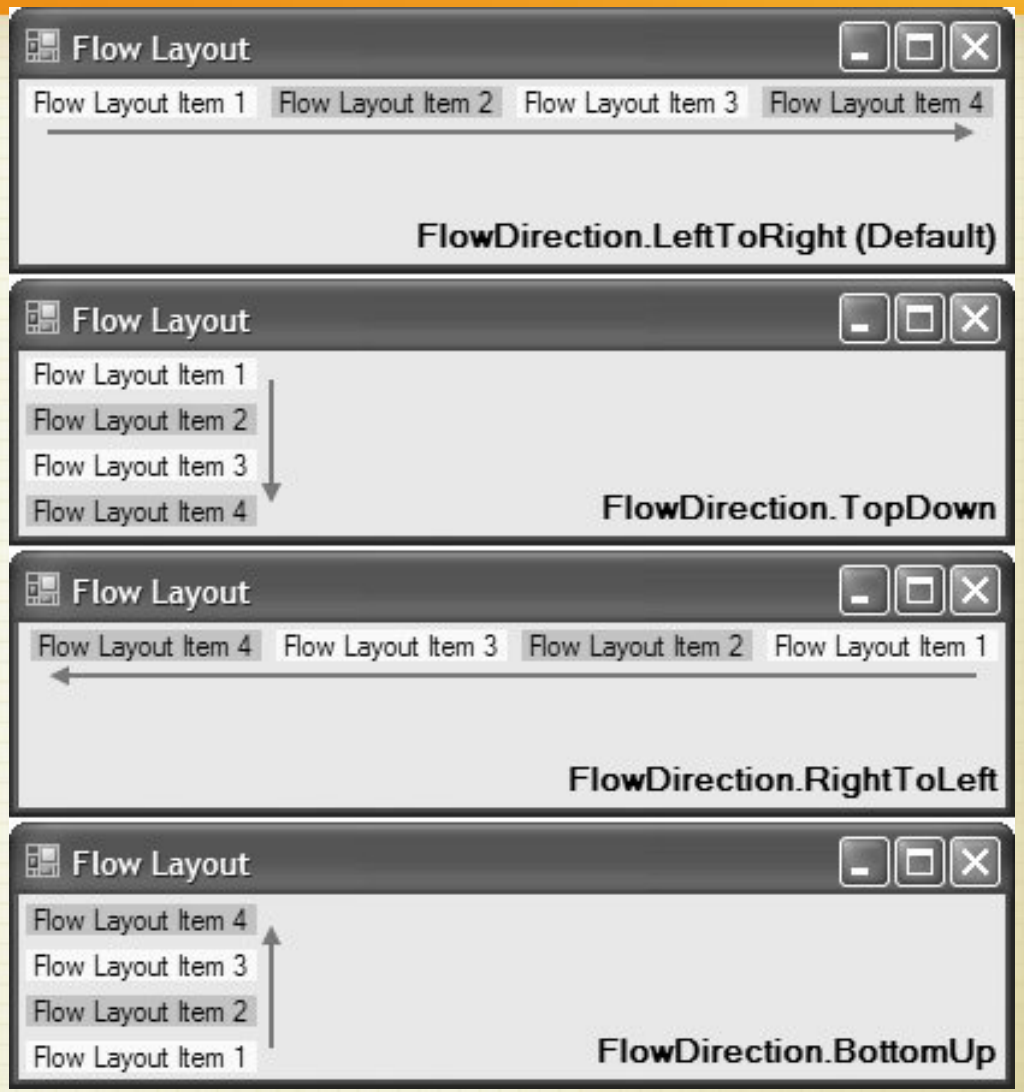
LAYOUT CONTROLS

- SplitContainer



LAYOUT CONTROLS

- FlowLayout



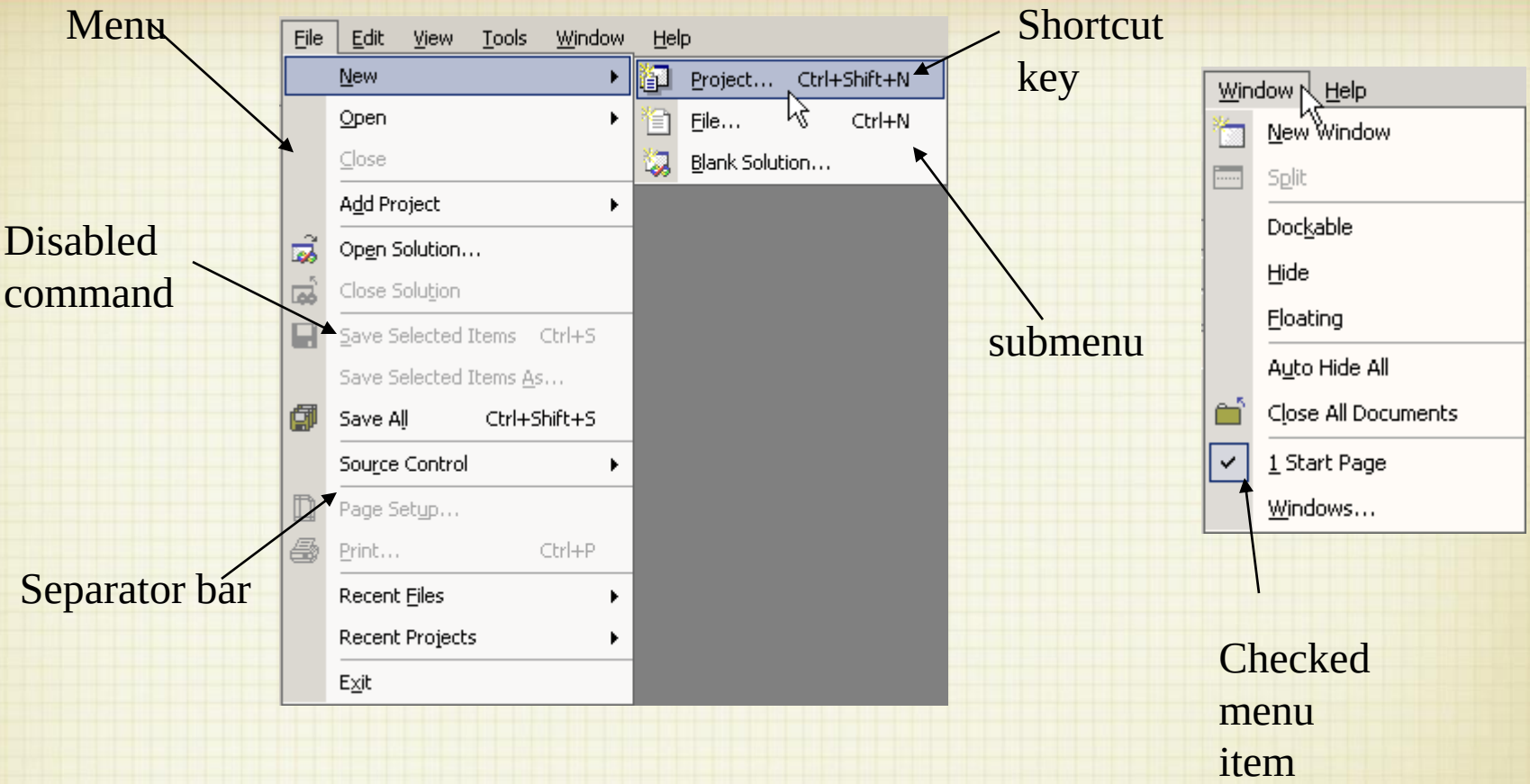
LAYOUT CONTROLS

- TableLayoutPanel

MENU

- Nhóm các lệnh liên quan với nhau
- Gồm:
  - Commands
  - Submenus
- Mỗi chọn lựa có event handler của nó

MENU


Menu
Shortcut key
Disabled command
submenu
Separator bar
Checked menu item
File
Edit
View
Tools
Window
Help
New
Open
Close
Add Project
Open Solution...
Close Solution
Save Selected Items Ctrl+S
Save Selected Items As...
Save All Ctrl+Shift+S
Source Control
Page Setup...
Print... Ctrl+P
Recent Files
Recent Projects
Exit
Project... Ctrl+Shift+N
File... Ctrl+N
Blank Solution...
Window
Help
New Window
Split
Dockable
Hide
Floating
Auto Hide All
Close All Documents
1 Start Page
Windows...

Thuộc tính Main Menu

MenuItems	Collection of **MenuItem**s for the **MainMenu**.
RightToLeft	Used to display text from right to left. Useful for languages that are read from right to left.

Thuộc tính MenuItem

Checked	Whether menu item appears checked (according to property **RadioCheck**). Default **false**, meaning that the menu item is not checked.
Index	Item's position in parent menu.
MenuItems	Collection of submenu items for this menu item.
MergeOrder	This property sets the position of menu item when parent menu merged with another menu.
MergeType	This property takes a value of the **MenuMerge** enumeration. Specifies how parent menu merges with another menu. Possible values are **Add**, **MergeItems**, **Remove** and **Replace**.

Thuộc tính MenuItem

RadioCheck	If **true**, menu item appears as radio button (black circle) when checked; if **false**, menu item displays checkmark. Default **false**.
Shortcut	Shortcut key for the menu item (i.e. *Ctrl + F9* can be equivalent to clicking a specific item).
ShowShortcut	If **true**, shortcut key shown beside menu item text. Default **true**.
Text	Text to appear on menu item. To make an *Alt* access shortcut, precede a character with **&** (i.e. **&File** for **File**).
Enabled	
Visible	
DefaultItem	

Menu Constructors

MainMenu();
MainMenu(MenuItem[] ami);

FormName.Menu = mMenu

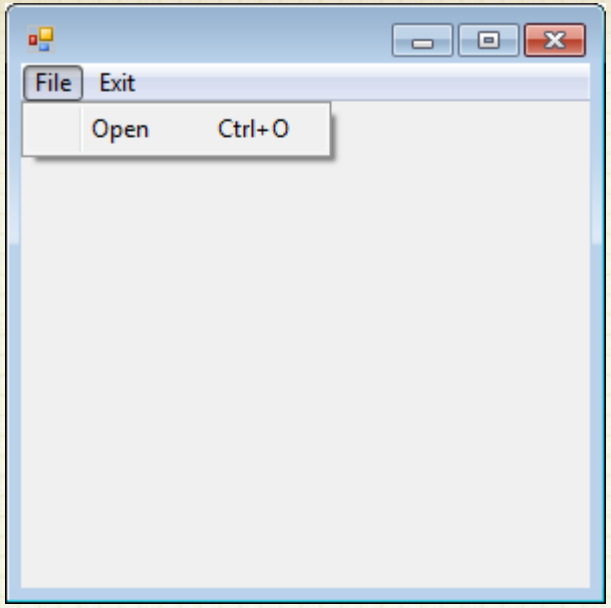
ContextMenu()
ContextMenu(MenuItem[] ami)

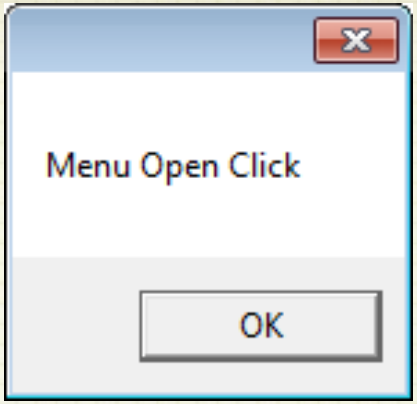
FormName.ContextMenu = cMenu

MenuItem()
MenuItem(string strText)
MenuItem(string strText, EventHandler ehClick)
MenuItem(string strText, EventHandler ehClick, Shortcut sc)
MenuItem(string strText, MenuItem[] ami)

mMenu.MenuItems.Add(miItem)
cMenu. .MenuItems.Add(miItem)

Menu



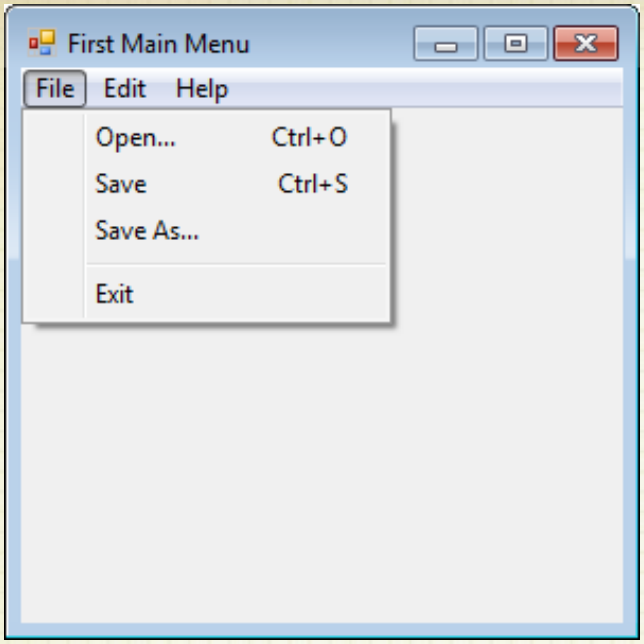


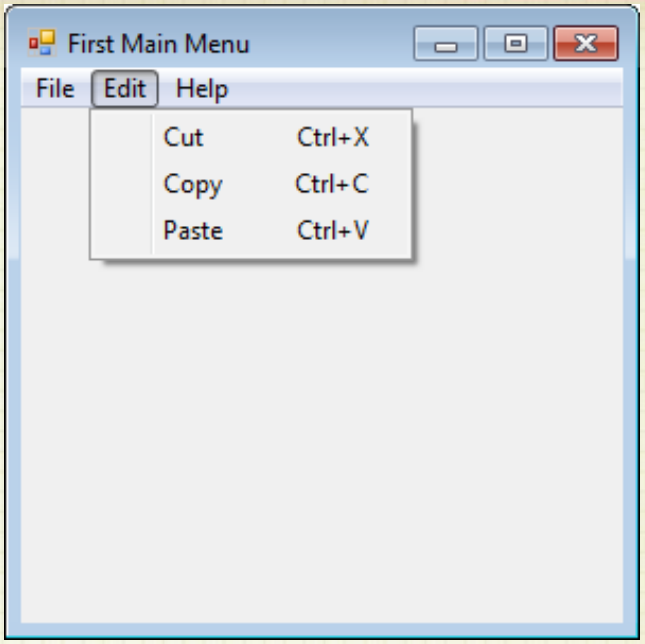
```
class MenuForm:Form
   {
      MainMenu mMenu;
      MenuItem mFile;
      MenuItem miFileOpen;
      public MenuForm()
      {
         mMenu = new MainMenu();
         mFile=new MenuItem();
         mFile.Text="File";
         miFileOpen = new MenuItem();
         miFileOpen.Text = "Open";
         miFileOpen.Click+=new EventHandler(miFileOpen_Click);
         mFile.MenuItems.Add(miFileOpen);
         mMenu.MenuItems.Add(mFile);
         this.Menu = mMenu;
      }
      void miFileOpen_Click(Object sender, EventArgs ea)
      {
         MessageBox.Show("Menu Open Click");
      }
   }
```

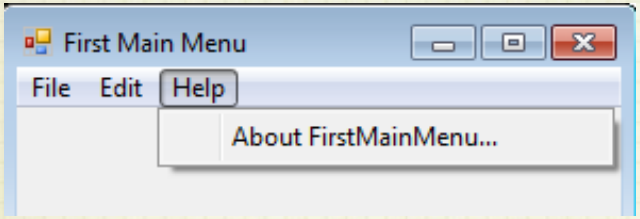
```
class MenuForm:Form
   {
      MainMenu mMenu;
      MenuItem mFile;
      MenuItem miFileOpen;

      public MenuForm()
      {

         miFileOpen = new MenuItem("Open",
                              new EventHandler(miFileOpen_Click),
                                    Shortcut.CtrlO);
         mFile = new MenuItem("File", new MenuItem[] { miFileOpen});
         mMenu = new MainMenu(new MenuItem[] { mFile });
         this.Menu = mMenu;
      }
      void miFileOpen_Click(Object sender, EventArgs ea)
      {
         MessageBox.Show("Menu Open Click");
      }
   }
```

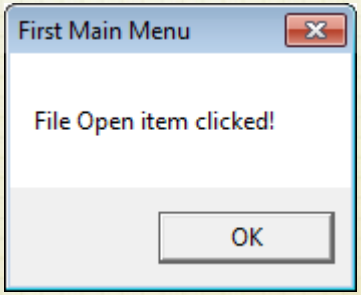
```
class MenuForm:Form
   {
      MainMenu mMenu;
      MenuItem mFile;
      MenuItem miFileOpen;
     MenuItem mExit;
      public MenuForm()
      {
        miFileOpen = new MenuItem("Open",
                                  new EventHandler(miFileOpen_Click),
                                        Shortcut.CtrlO);
         mFile = new MenuItem("File", new MenuItem[] { miFileOpen});
         mExit = new MenuItem("Exit", new EventHandler(mExit_Click),
                                  Shortcut.CtrlX);
         mMenu = new MainMenu(new MenuItem[] { mFile,mExit });
         this.Menu = mMenu;
      }
      void miFileOpen_Click(Object sender, EventArgs ea) {……}
      void mExit_Click(Object sender, EventArgs ea)
      { Application.Exit();  }
}
```

Menu


First Main Menu
File
Edit
Help
Open... Ctrl+O
Save Ctrl+S
Save As...
Exit


First Main Menu
File
Edit
Help
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V


First Main Menu
File
Edit
Help
About FirstMainMenu...


First Main Menu
File Open item clicked!
OK

```
class FirstMainMenu : Form
   {
      public FirstMainMenu()
      {
         Text = "First Main Menu";
         // Items on File submenu
         MenuItem miOpen = new MenuItem("&Open...",
                           new EventHandler(MenuFileOpenOnClick),
                           Shortcut.CtrlO);
         MenuItem miSave = new MenuItem("&Save“,…);
         MenuItem miSaveAs = new MenuItem("Save &As...“),
         MenuItem miDash = new MenuItem("-");
         MenuItem miExit = new MenuItem("E&xit“,…);
         // File item
         MenuItem miFile = new MenuItem("&File",
                           new MenuItem[] {miOpen, miSave, miSaveAs, miDash, miExit });
         // Items on Edit submenu
         // Edit item
         // Item on Help submenu
         // Help item
         // Main menu
         Menu = new MainMenu(new MenuItem[] { miFile, miEdit, miHelp });
      }
```

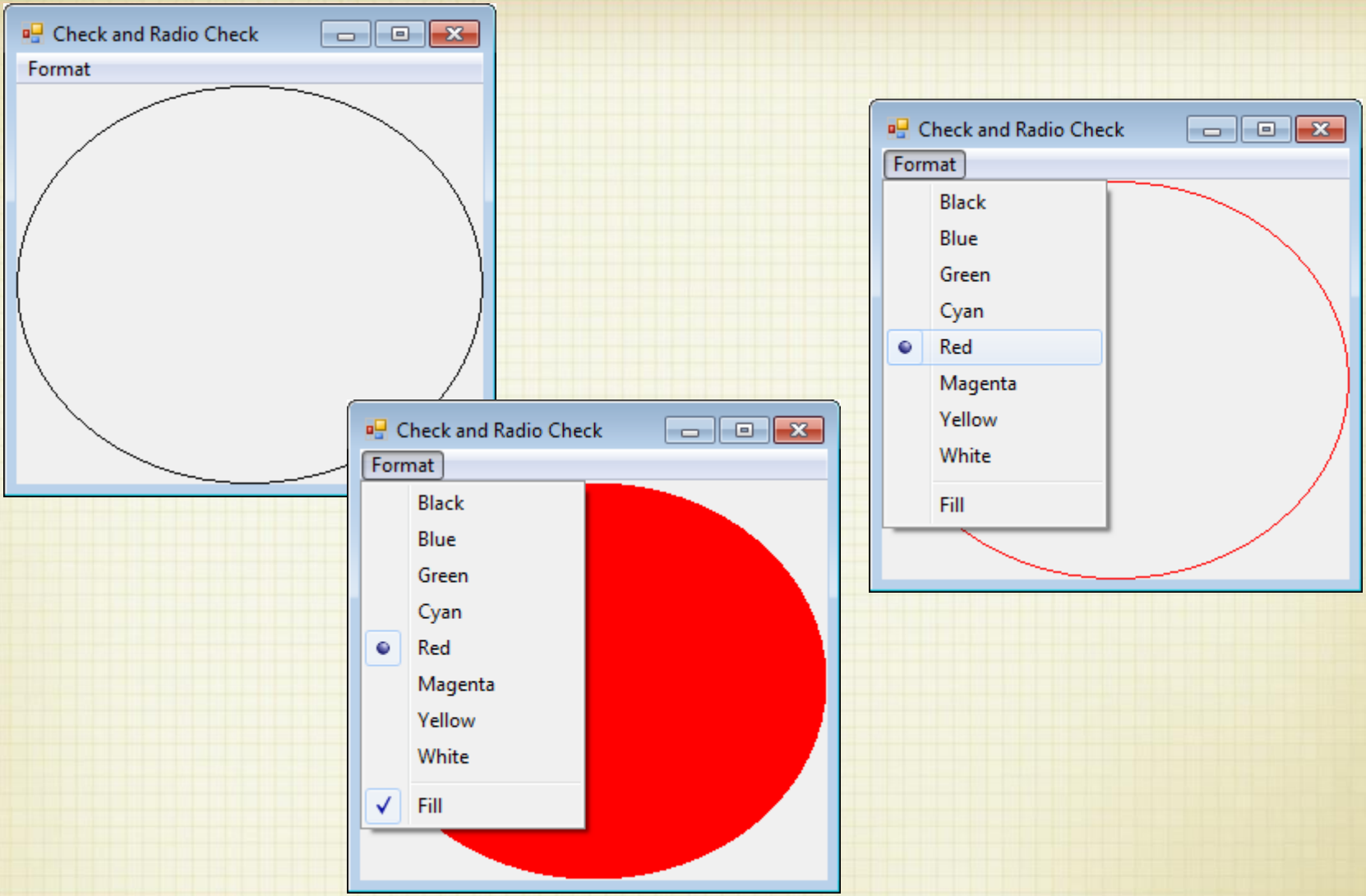
Menu

```
  void MenuFileOpenOnClick(object obj, EventArgs ea)
    {    MessageBox.Show("File Open item clicked!", Text);    }
    void MenuFileSaveOnClick(object obj, EventArgs ea)    {…}
    void MenuFileSaveAsOnClick(object obj, EventArgs ea) {…}
    void MenuFileExitOnClick(object obj, EventArgs ea)   {  Close();   }
    void MenuEditCutOnClick(object obj, EventArgs ea) {…}
    void MenuEditCopyOnClick(object obj, EventArgs ea) {…}
    void MenuEditPasteOnClick(object obj, EventArgs ea) {…}
     void MenuHelpAboutOnClick(object obj, EventArgs ea)
    {
        MessageBox.Show(Text + DateTime.Now);
    }
}
```

Cách viết khác

```
MenuItem miFile = new MenuItem("&File", new MenuItem[]
{
        new MenuItem("&Open...",
                                new EventHandler(MenuFileOpenOnClick),
                                Shortcut.CtrlO),
        new MenuItem("&Save",
                                new EventHandler(MenuFileSaveOnClick),
                                Shortcut.CtrlS),
        new MenuItem("Save &As...",
                                new EventHandler(MenuFileSaveAsOnClick)),
        new MenuItem("-"),
        new MenuItem("E&xit",
                                new EventHandler(MenuFileExitOnClick))

});
```

Menu


Check and Radio Check
Format
Check and Radio Check
Format
Black
Blue
Green
Cyan
Red
Magenta
Yellow
White
Fill
Check and Radio Check
Format
Black
Blue
Green
Cyan
Red
Magenta
Yellow
White
Fill

Menu

```
class CheckAndRadioCheck : Form
   {
      MenuItem miColor, miFill;
      public CheckAndRadioCheck();
      void MenuFormatColorOnClick(object obj, EventArgs ea);
      void MenuFormatFillOnClick(object obj, EventArgs ea);
      protected override void OnPaint(PaintEventArgs pea);
    }
```

```
public CheckAndRadioCheck()
    {
        Text = "Check and Radio Check";
        ResizeRedraw = true;
        string[] astrColor = {"Black", "Blue",    "Green",  "Cyan",
                              "Red",   "Magenta", "Yellow", "White"};
        MenuItem[] ami = new MenuItem[astrColor.Length + 2];
        EventHandler ehColor = new EventHandler(MenuFormatColorOnClick);
        for (int i = 0; i < astrColor.Length; i++)
        {
            ami[i] = new MenuItem(astrColor[i], ehColor);
            ami[i].RadioCheck = true;
        }
        miColor = ami[0];
        miColor.Checked = true;
        ami[astrColor.Length] = new MenuItem("-");
        miFill = new MenuItem("&Fill“, new EventHandler(MenuFormatFillOnClick))
        ami[astrColor.Length + 1] = miFill;
        MenuItem mi = new MenuItem("&Format", ami);
        Menu = new MainMenu(new MenuItem[] { mi });
    }
```

Menu

```
void MenuFormatColorOnClick(object obj, EventArgs ea)
        {
            miColor.Checked = false;
            miColor = (MenuItem)obj;
            miColor.Checked = true;
            Invalidate();
        }

void MenuFormatFillOnClick(object obj, EventArgs ea)
        {
            MenuItem mi = (MenuItem)obj;
            mi.Checked = !mi.Checked;
            Invalidate();
        }
```

Menu

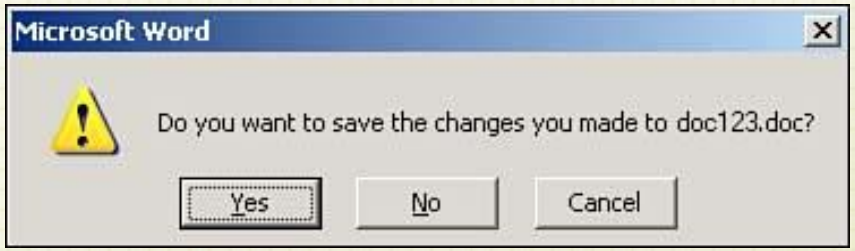
```
protected override void OnPaint(PaintEventArgs pea)
    {
        Graphics grfx = pea.Graphics;

        if (miFill.Checked)
        {
            Brush brush = new SolidBrush(Color.FromName(miColor.Text));
            grfx.FillEllipse(brush, 0, 0, ClientSize.Width - 1,
                                        ClientSize.Height - 1);
        }
        else
        {
            Pen pen = new Pen(Color.FromName(miColor.Text));
            grfx.DrawEllipse(pen, 0, 0, ClientSize.Width - 1,
                                       ClientSize.Height - 1);
        }
    }
```

DIALOG

- Dialog là 1 Windows Form đặc biệt dùng để tương tác với người sử dụng và cung cấp các thông báo.
- Dialog là một Windows Form đa năng.
- Dialog chính là 1 Form với thuộc tính ***FormBorderStyle*** có giá trị ***FixedDialog***

DIALOG

- Mục đích sử dụng chính của Dialog là trao đổi thông tin với người sử dụng.
- Sau khi lấy được thông tin, trình xử lý của Dialog sẽ lấy thông tin đó thực hiện một công việc khác.



PHÂN LOẠI DIALOG

MODAL

- Phải cung cấp thông tin trước khi tiếp tục thực hiện chương trình
- Dùng khi cần thu thập thông tin

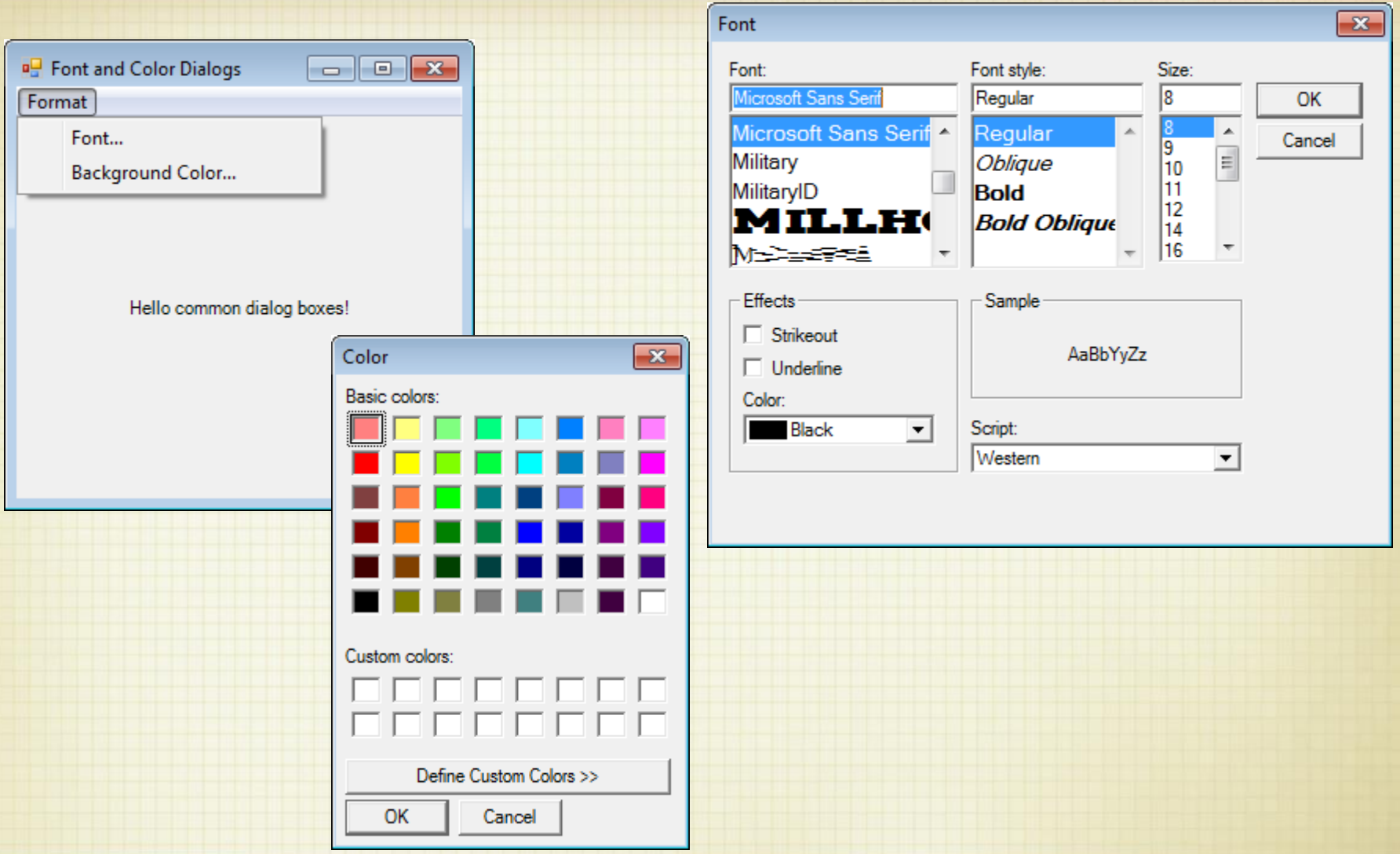
MODELESS

- Có thể tiếp tục sử dụng chương trình mà không cần phản hồi thông tin trong Dialog
- Dùng khi chỉ đơn thuần thông báo thông tin.

CÁC DIALOG PHỔ BiẾN

- ColorDialog
- FontDialog
- OpenFileDialog
- PageSetupDialog
- PrintDialog
- PrintPreviewDialog
- SaveFileDialog

Font và Color Dialog



Font và Color Dialog

```
class FontAndColorDialogs : Form
   {

      public FontAndColorDialogs()
      {
         Text = "Font and Color Dialogs";
         ResizeRedraw = true;
         Menu = new MainMenu();
         Menu.MenuItems.Add("&Format");
         Menu.MenuItems[0].MenuItems.Add("&Font...",
                                  new EventHandler(MenuFontOnClick));
         Menu.MenuItems[0].MenuItems.Add("&Background Color...",
                                  new EventHandler(MenuColorOnClick));
      }
```

Font và Color Dialog

```
void MenuFontOnClick(object obj, EventArgs ea)
        {
            FontDialog fontdlg = new FontDialog();

            fontdlg.Font = Font;
            fontdlg.Color = ForeColor;
            fontdlg.ShowColor = true;

            if (fontdlg.ShowDialog() == DialogResult.OK)
            {
                Font = fontdlg.Font;
                ForeColor = fontdlg.Color;
                Invalidate();
            }
        }
```

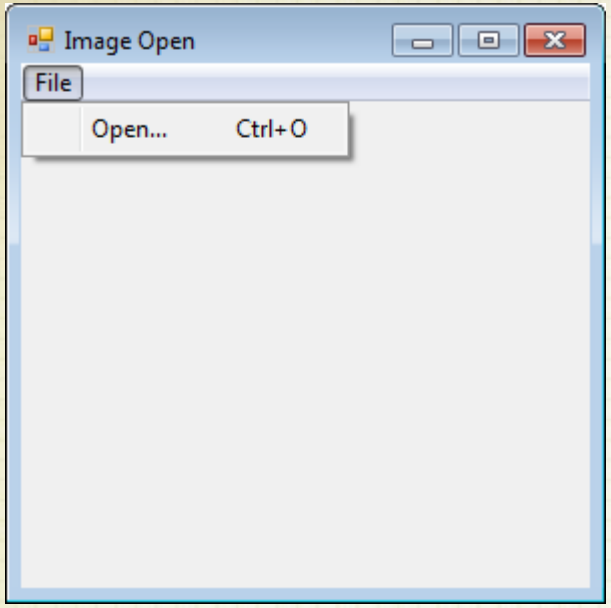
Font và Color Dialog

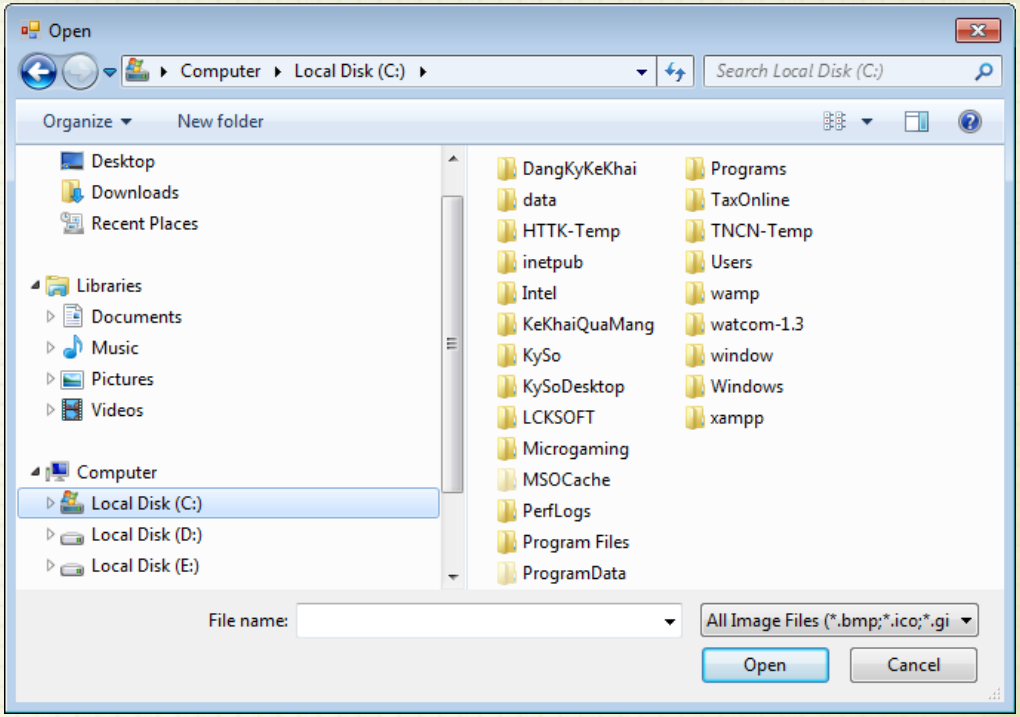
```
void MenuColorOnClick(object obj, EventArgs ea)
        {
            ColorDialog clrdlg = new ColorDialog();

            clrdlg.Color = BackColor;

            if (clrdlg.ShowDialog() == DialogResult.OK)
                BackColor = clrdlg.Color;
        }
```

Font và Color Dialog

```
protected override void OnPaint(PaintEventArgs pea)
      {
          Graphics grfx = pea.Graphics;
          StringFormat strfmt = new StringFormat();
          strfmt.Alignment = strfmt.LineAlignment = StringAlignment.Center;
          grfx.DrawString("Hello common dialog boxes!", Font,
                          new SolidBrush(ForeColor),
                          this.ClientRectangle, strfmt);
      }
```

Open File Dialog





```
class ImageOpen : Form
   {
      protected string strProgName;
      protected string strFileName;
      protected Image image;
      public ImageOpen()
      {
         Text = strProgName = "Image Open";
         ResizeRedraw = true;

         Menu = new MainMenu();
         Menu.MenuItems.Add("&File");
         Menu.MenuItems[0].MenuItems.Add(new MenuItem("&Open...",
                              new EventHandler(MenuFileOpenOnClick),
                              Shortcut.CtrlO));
      }
     protected override void OnPaint(PaintEventArgs pea)
      {
         Graphics grfx = pea.Graphics;

         if (image != null)
            grfx.DrawImage(image, 0, 0);
      }
```

```
void MenuFileOpenOnClick(object obj, EventArgs ea)
    {
        OpenFileDialog dlg = new OpenFileDialog();

        dlg.Filter = "All Image Files|*.bmp;*.ico;*.gif;*.jpeg;*.jpg;" +
                          "*.jfif;*.png;*.tif;*.tiff;*.wmf;*.emf|" +
                     "Windows Bitmap (*.bmp)|*.bmp|" +
                     "All Files (*.*)|*.*“;
        if (dlg.ShowDialog() == DialogResult.OK)
        {
            try
            {
                image = Image.FromFile(dlg.FileName);
            }
            catch (Exception exc)
            {
                MessageBox.Show(exc.Message, strProgName);
                return;
            }
            strFileName = dlg.FileName;
            Text = strProgName + " - " + Path.GetFileName(strFileName);
            Invalidate();
        }
    }
```

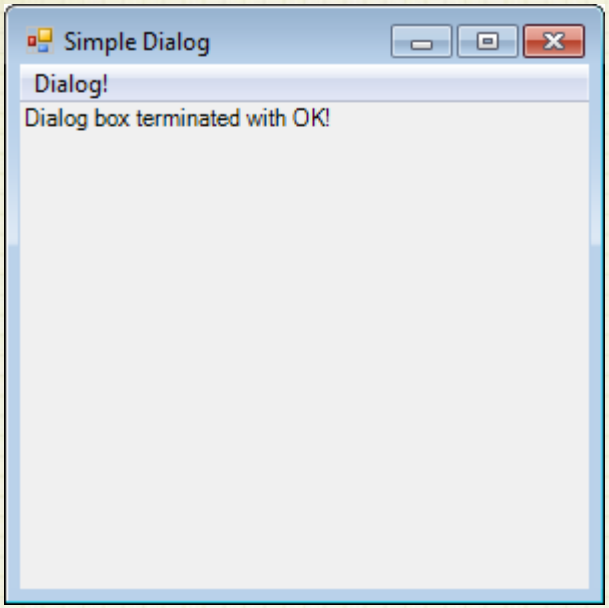
TẠO MỚI DIALOG

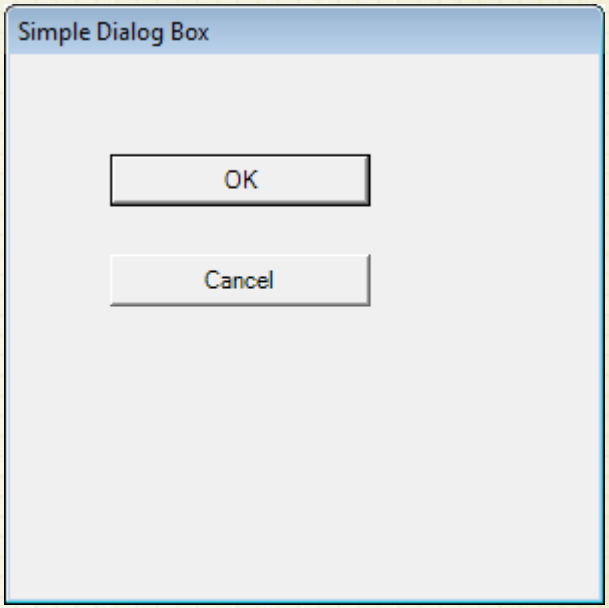
- Các Dialog có sẵn không thể đáp ứng hết nhu cầu của người sử dụng.
- Tạo mới Dialog tương tự như tạo 1 form
- Không chứa phương thức Main()

LẤY THÔNG TIN PHẢN HỒI

- Sử dụng thuộc tính DialogResult
  - Abort
  - Cancel
  - Ignore
  - No
  - None
  - OK
  - Retry
  - Yes

Ví dụ 1


Simple Dialog
Dialog!
Dialog box terminated with OK!


Simple Dialog Box
OK
Cancel

```
class SimpleDialogBox:Form
   {
      public SimpleDialogBox()
      {
         Text = "Simple Dialog Box“;
         FormBorderStyle = FormBorderStyle.FixedDialog;
         ControlBox = false; MaximizeBox = false;
         MinimizeBox = false;ShowInTaskbar = false;
         Button btn = new Button();
         btn.Parent = this;
         btn.Text = "OK";
         btn.Location = new Point(50, 50);
         btn.Size = new Size(10 * Font.Height, 2 * Font.Height);
         btn.Click += new EventHandler(ButtonOkOnClick);
         btn = new Button();
         btn.Parent = this;
         btn.Text = "Cancel";
         btn.Location = new Point(50, 100);
         btn.Size = new Size(10 * Font.Height, 2 * Font.Height);
         btn.Click += new EventHandler(ButtonCancelOnClick);
      }
```

Phiên bản 0.1

```
void ButtonOkOnClick(object obj, EventArgs ea)
        {
            DialogResult = DialogResult.OK;
        }
        void ButtonCancelOnClick(object obj, EventArgs ea)
        {
            DialogResult = DialogResult.Cancel;
        }

    }
```

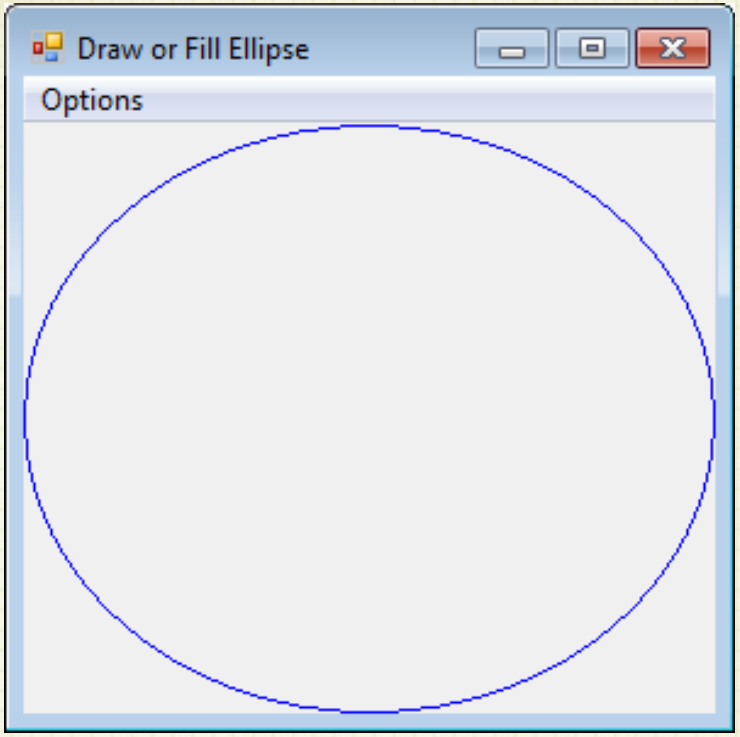
Phiên bản 0.1

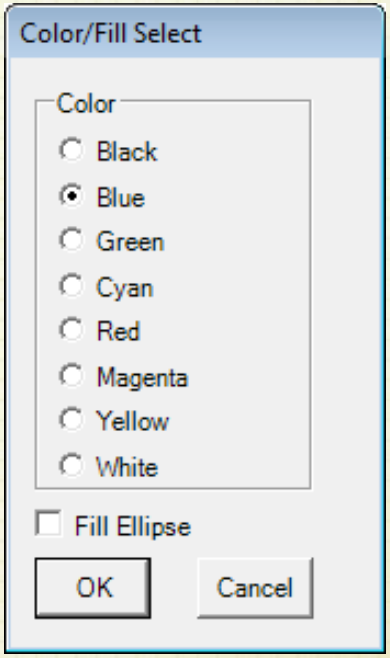
```
class SimpleDialog : Form
   {
      string strDisplay = "“;
      public SimpleDialog()
      {
         Text = "Simple Dialog“;
         Menu = new MainMenu();
         Menu.MenuItems.Add("&Dialog!", new EventHandler(MenuOnClick));
      }
      void MenuOnClick(object obj, EventArgs ea)
      {
         SimpleDialogBox dlg = new SimpleDialogBox();
         dlg.ShowDialog();
         strDisplay = "Dialog box terminated with " + dlg.DialogResult + "!";
         Invalidate();
      }
      protected override void OnPaint(PaintEventArgs pea)
      {….. }
   }
```

```
class SimpleDialogBox:Form
   {
      public SimpleDialogBox()
      {
         Text = "Simple Dialog Box“;
         FormBorderStyle = FormBorderStyle.FixedDialog;
         ControlBox = false; MaximizeBox = false;
         MinimizeBox = false;ShowInTaskbar = false;
         Button btn = new Button();
         btn.Parent = this;
         btn.Text = "OK";
         btn.Location = new Point(50, 50);
         btn.Size = new Size(10 * Font.Height, 2 * Font.Height);
          btn.DialogResult = DialogResult.OK;
         btn = new Button();
         btn.Parent = this;
         btn.Text = "Cancel";
         btn.Location = new Point(50, 100);
         btn.Size = new Size(10 * Font.Height, 2 * Font.Height);
         btn.DialogResult = DialogResult.Cancel;
      }
}
```

Phiên bản 0.2: Dùng Property DialogResult

Ví dụ


Draw or Fill Ellipse
Options


Color/Fill Select
Color
Black
Blue
Green
Cyan
Red
Magenta
Yellow
White
Fill Ellipse
OK
Cancel

Modeless Dialog