

Введение в System.Windows.Forms

Создание простой формы


```
using System;
using System.Collections.Generic;
using System.Text;
using System.Windows.Forms;

namespace ConsoleApplication1
{
    public class MyForm : Form { }

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

Обработка события ApplicationExit

```
public class MyForm : Form
{
    public MyForm()
    {
        Application.ApplicationExit += new EventHandler(OnExit);
    }
    private void OnExit(object sender, EventArgs e)
    {
        MessageBox.Show("bye");
    }
}
```



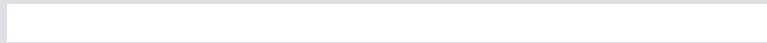
Обработка событий мышки

```
public class MyForm : Form
{
    public MyForm()
    {
        MouseUp += new MouseEventHandler(MyForm_MouseUp);
    }

    public void MyForm_MouseUp(object sender, MouseEventArgs e)
    {
        Text = string.Format("Текущая позиция указателя: ({0},{1})", e.X, e.Y);
        MessageBox.Show(Text);
    }
}
```

Свойства типа MouseEventArgs

- Button – какая клавиша была нажата.
- Clicks – сколько раз клавиша была нажата.
- Delta – сколько было щелчков при вращении колесика.
- X, Y – значения координат мышки.



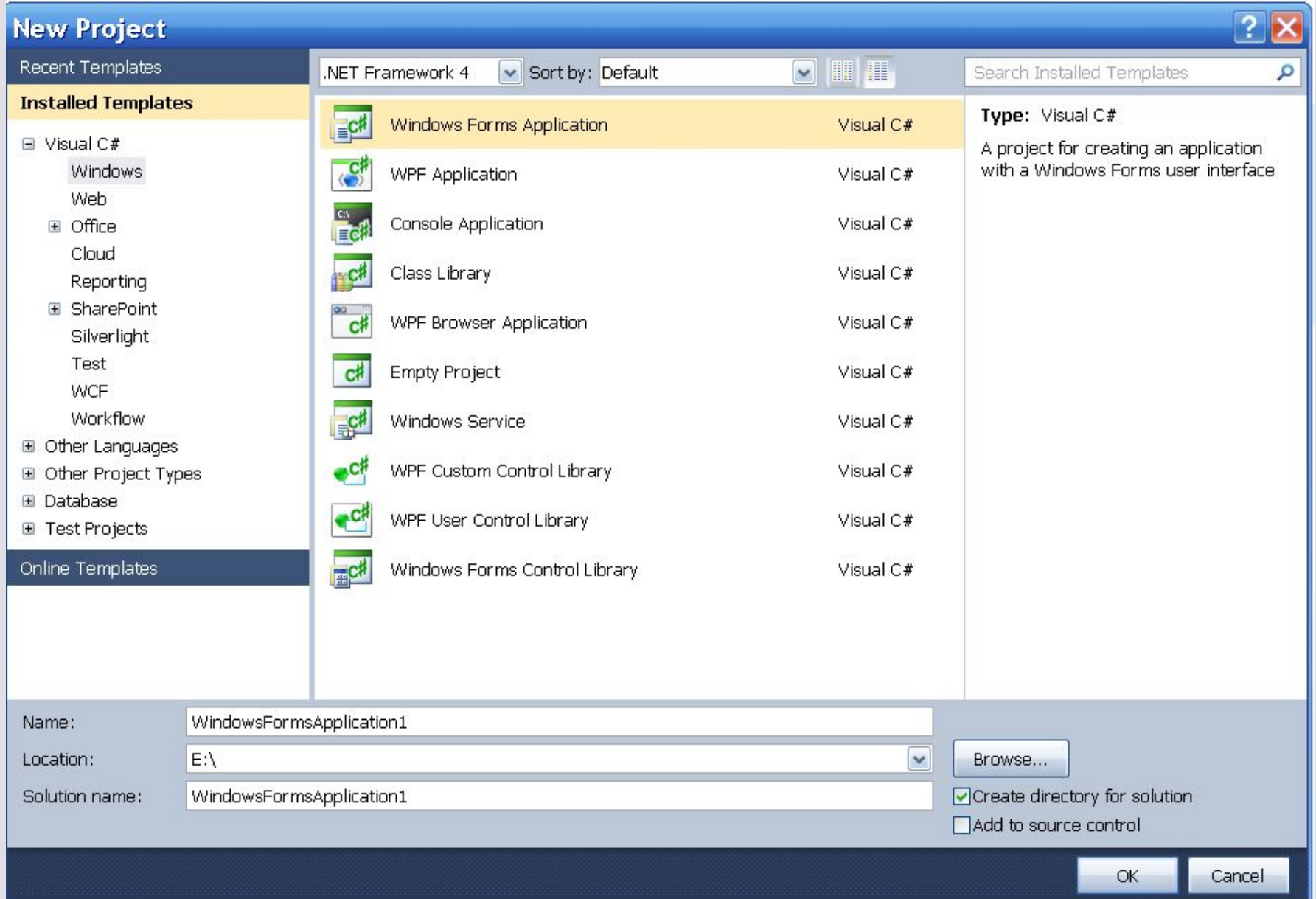
Основные методы класса Form

- `Activate()`
- `Close()`

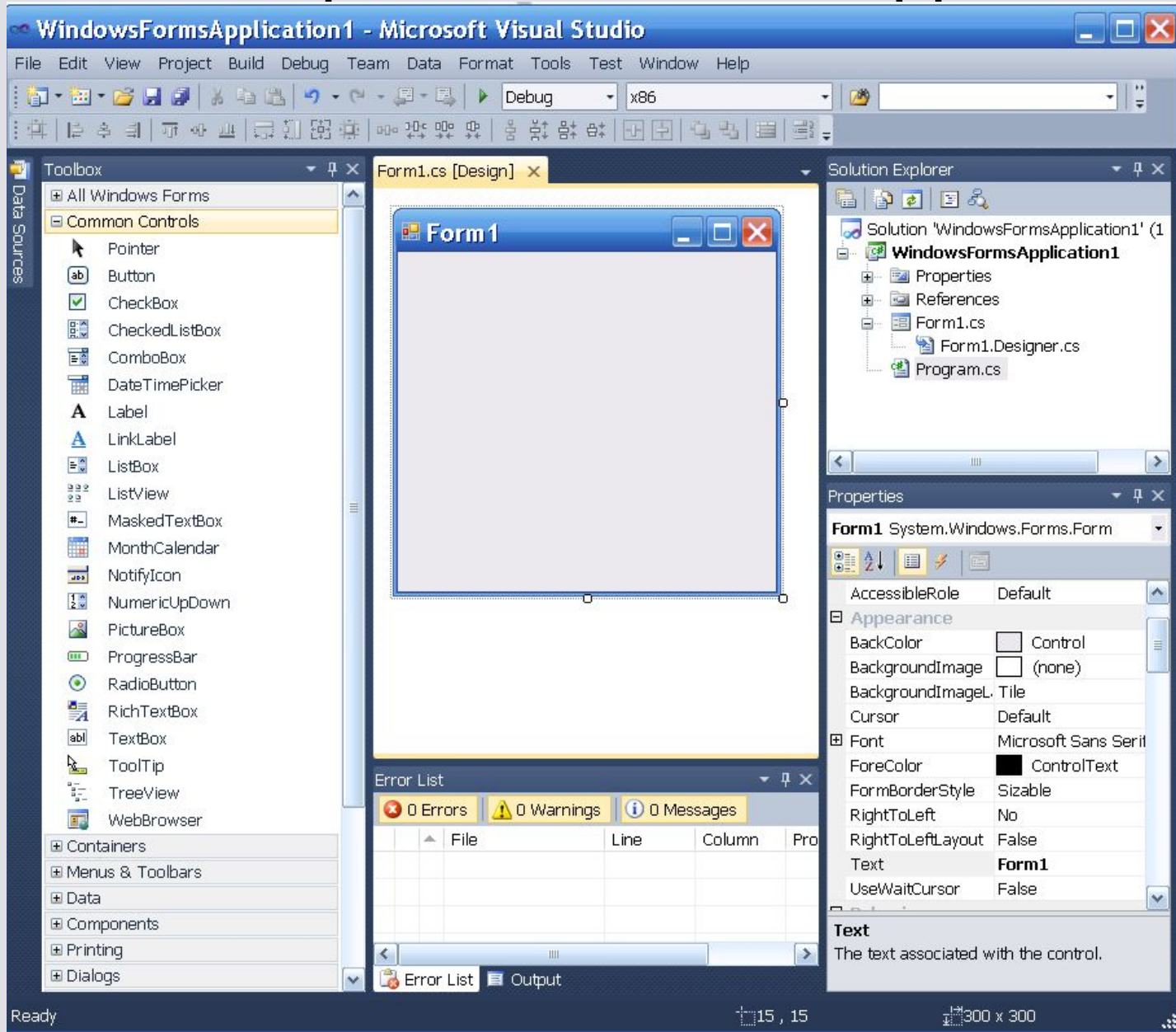
Основные события класса Form

- Activated
- Closed
- Closing
- Deactivate
- Load

Шаблон проекта WindowsApplication



Шаблон проекта WindowsApplication



Шаблон проекта WindowsApplication

```
namespace WindowsFormsApplication1
{
    partial class Form1
    {
        /// <summary>
        /// Required designer variable.
        /// </summary>
        private System.ComponentModel.IContainer components = null;

        /// <summary>
        /// Clean up any resources being used.
        /// </summary>
        /// <param name="disposing">true if managed resources should be disposed; otherwise, false;
        /// </param>
        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

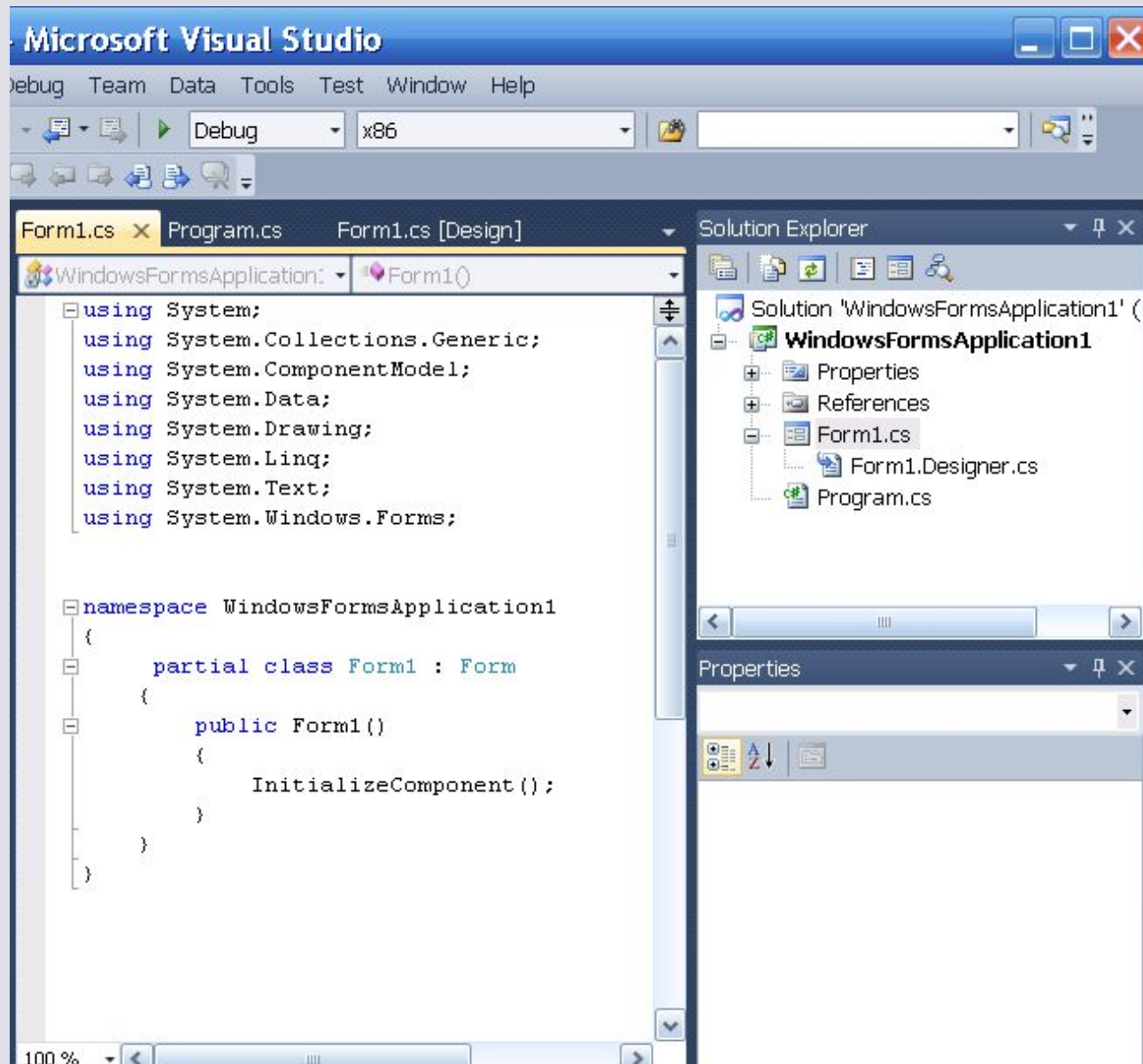
        #region Windows Form Designer generated code

        /// <summary>
```

The screenshot displays the Visual Studio IDE with the following components:

- Code Editor:** Shows the source code for `Form1.cs`. The code defines a `partial class Form1` within the `WindowsFormsApplication1` namespace. It includes a `private System.ComponentModel.IContainer components = null;` property, a `Dispose` method that disposes of the `components` and calls `base.Dispose(disposing);`, and a `#region Windows Form Designer generated code` section.
- Solution Explorer:** Shows the project structure for `WindowsFormsApplication1`, including `Properties`, `References`, `Form1.cs`, `Form1.Designer.cs`, and `Program.cs`.
- Properties Window:** Currently empty.
- Error List:** Shows 0 Errors, 0 Warnings, and 0 Messages.
- Status Bar:** Shows the current cursor position as `Ln 1 Col 1 Ch 1 INS`.

Шаблон проекта WindowsApplication



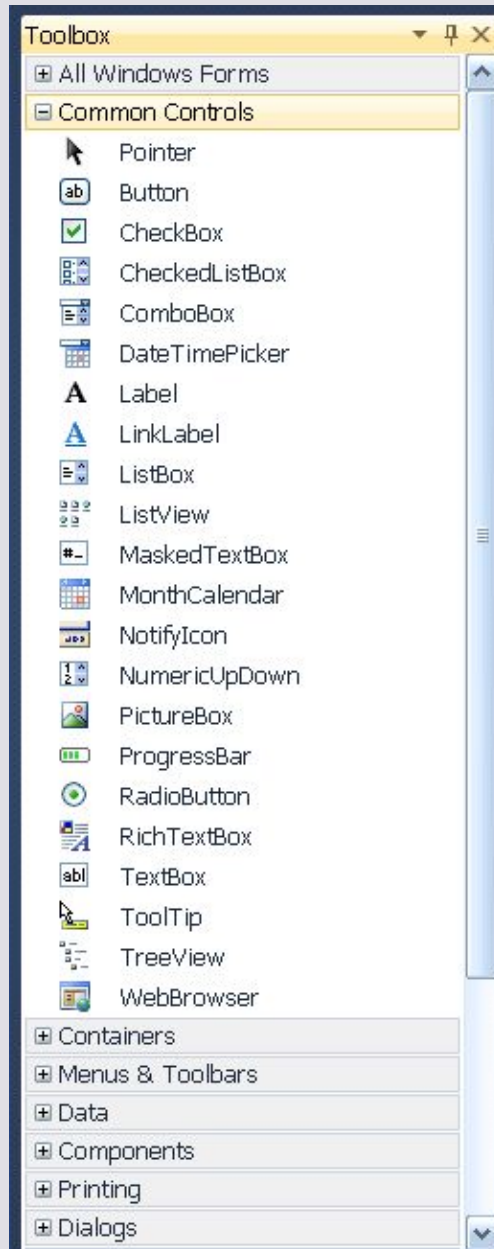
Структура палитры инструментов

The screenshot displays the Microsoft Visual Studio interface for a Windows Forms application. The main window is titled "WindowsFormsApplication1 - Microsoft Visual Studio". The menu bar includes File, Edit, View, Project, Build, Debug, Team, Data, Tools, Test, Window, and Help. The toolbar shows various development tools and a "Debug" dropdown menu. The "Toolbox" window on the left lists categories of controls: All Windows Forms, Common Controls, Containers, Menus & Toolbars, Data, Components, Printing, Dialogs, WPF Interoperability, Reporting, Visual Basic PowerPacks, and General. Below the toolbox, a message states: "There are no usable controls in this group. Drag an item onto this text to add it to the toolbox." The central design view shows a blank "Form1" window. The "Solution Explorer" on the right shows the project structure: Solution 'WindowsFormsApplication1' containing WindowsFormsApplication1, Properties, References, Form1.cs, Form1.Designer.cs, and Program.cs. The "Properties" window on the right shows the properties for "Form1 System.Windows.Forms.Form", including AccessibleName, AccessibleRole, Appearance (BackColor, BackgroundImage, BackgroundImage1, Cursor), Font (Font, ForeColor, FormBorderStyle, RightToLeft, RightToLeftLayout, Text), and Text (Text). The "Error List" window at the bottom shows 0 Errors, 0 Warnings, and 0 Messages. The status bar at the bottom left indicates "Ready".

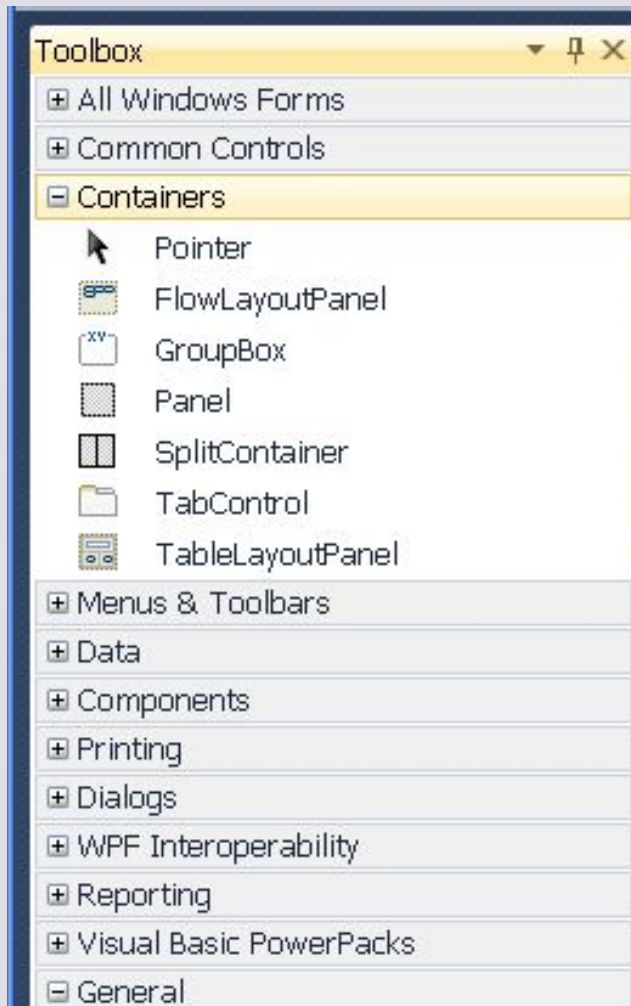
Структура палитры инструментов



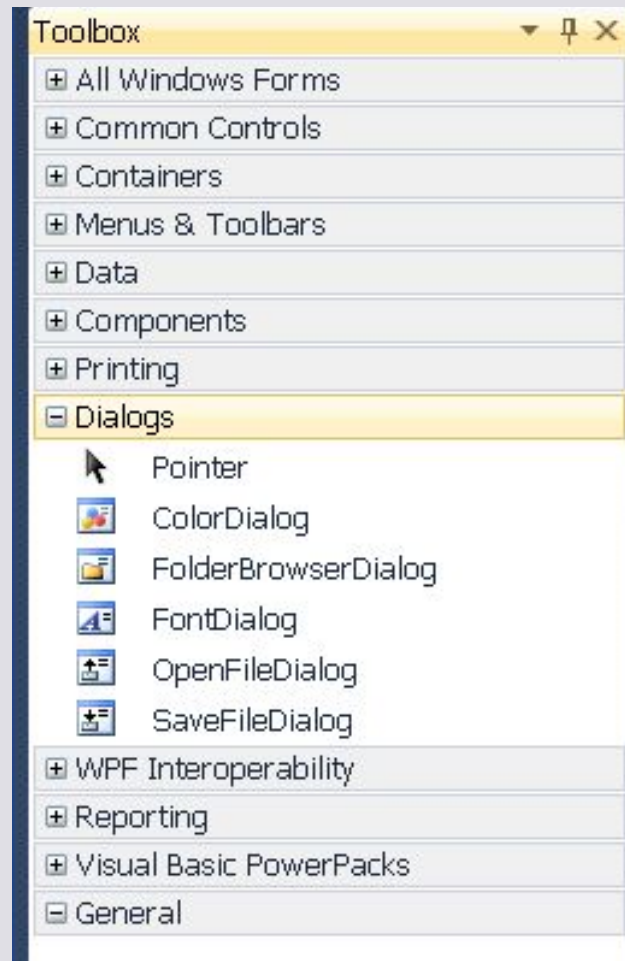
Основные элементы управления



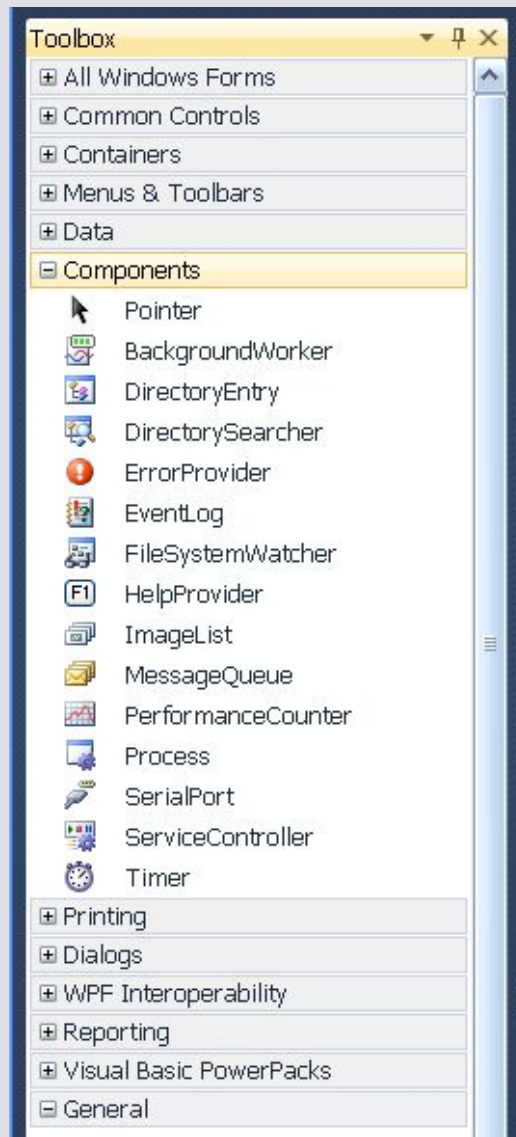
Контейнеры



Диалоговые окна

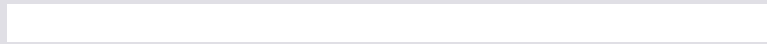


Компоненты

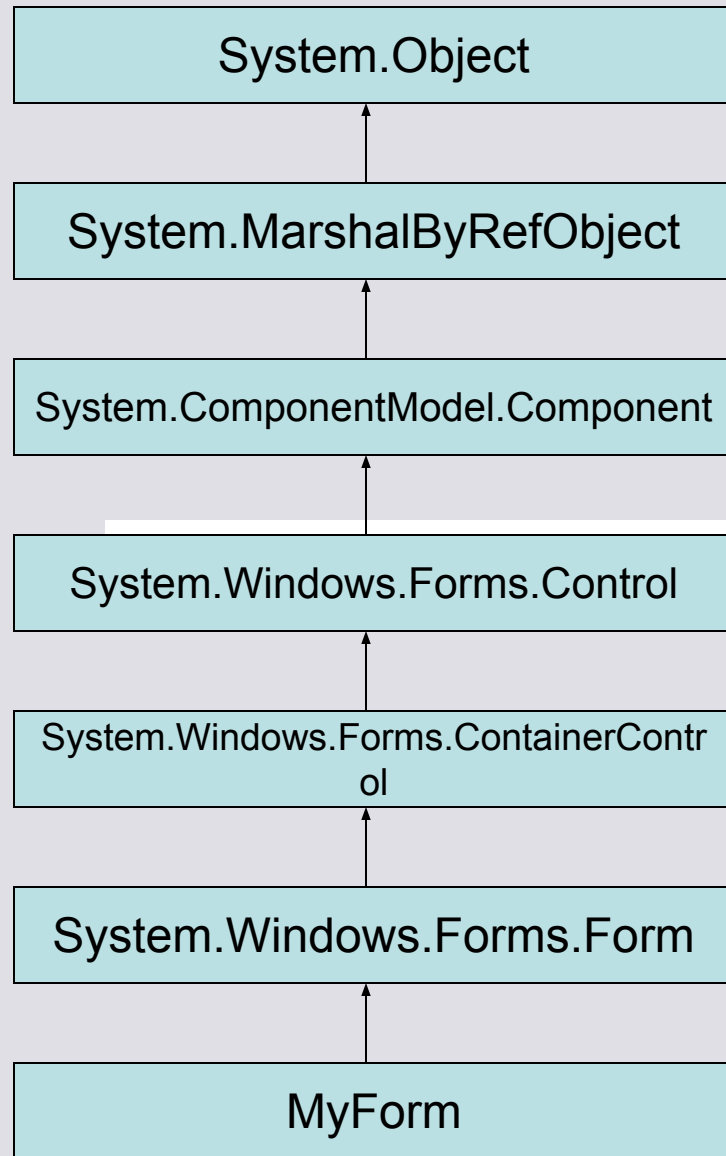


Структура библиотеки System.Windows.Forms

1. Базовые классы
2. Визуальные компоненты - элементы управления
3. Компоненты
4. Диалоговые окна



Базовые классы класса Form



Ключевые свойства класса Control

- Свойства, определяющие параметры визуализации элемента управления (BackColor, ForeColor, BackgroundImage, Font, Cursor)
- Параметры размещения элемента управления в контейнере (Anchor, Dock)
- Текущие размеры элемента управления.
- Характеристики состояния элемента управления (Enabled, Focused, Visible).
- Порядок перехода (TabIndex, TabStop).
- Name – имя соответствующего элемента управления.
- Text, Font – ассоциированный текст и его параметры.
- Tag – ссылка на объект, ассоциированный с данным элементом управления.
- Opacity – свойство, определяющее степень прозрачности элемента управления.
- Controls – коллекция, содержащая все дочерние элементы управления, существующие в рамках данного элемента управления.
- Статические свойства, определяющие состояние мышки (MouseButtons, MousePosition).

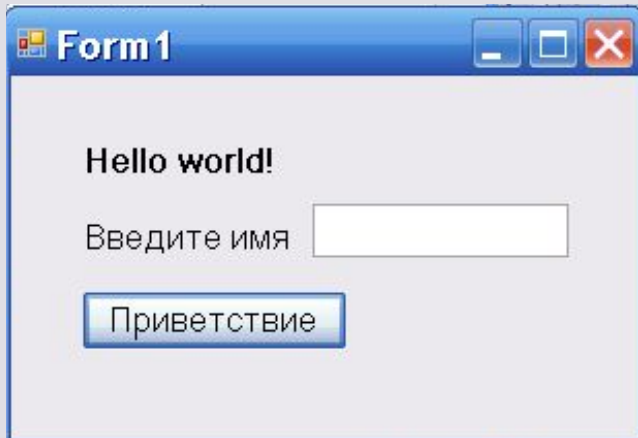
Некоторые события класса Control

- События, позволяющие учитывать состояние мышки (Click, DoubleClick, MouseEnter, MouseLeave, MouseDown, MouseUp, MouseMove, MouseHover, MouseWheel).
- События, позволяющие учитывать состояние клавиатуры (KeyDown, KeyPress, KeyUp).
- Paint - событие, возникающее при попытке элемента управления обновить свое изображение.

Некоторые методы класса Control

- Hide()
- Show()
- Invalidate()

Пример приложения



Пример приложения

The screenshot displays the Microsoft Visual Studio environment for a Windows Forms application named 'WindowsFormsApplication1'. The main design surface shows a window titled 'Form1' with the following controls:

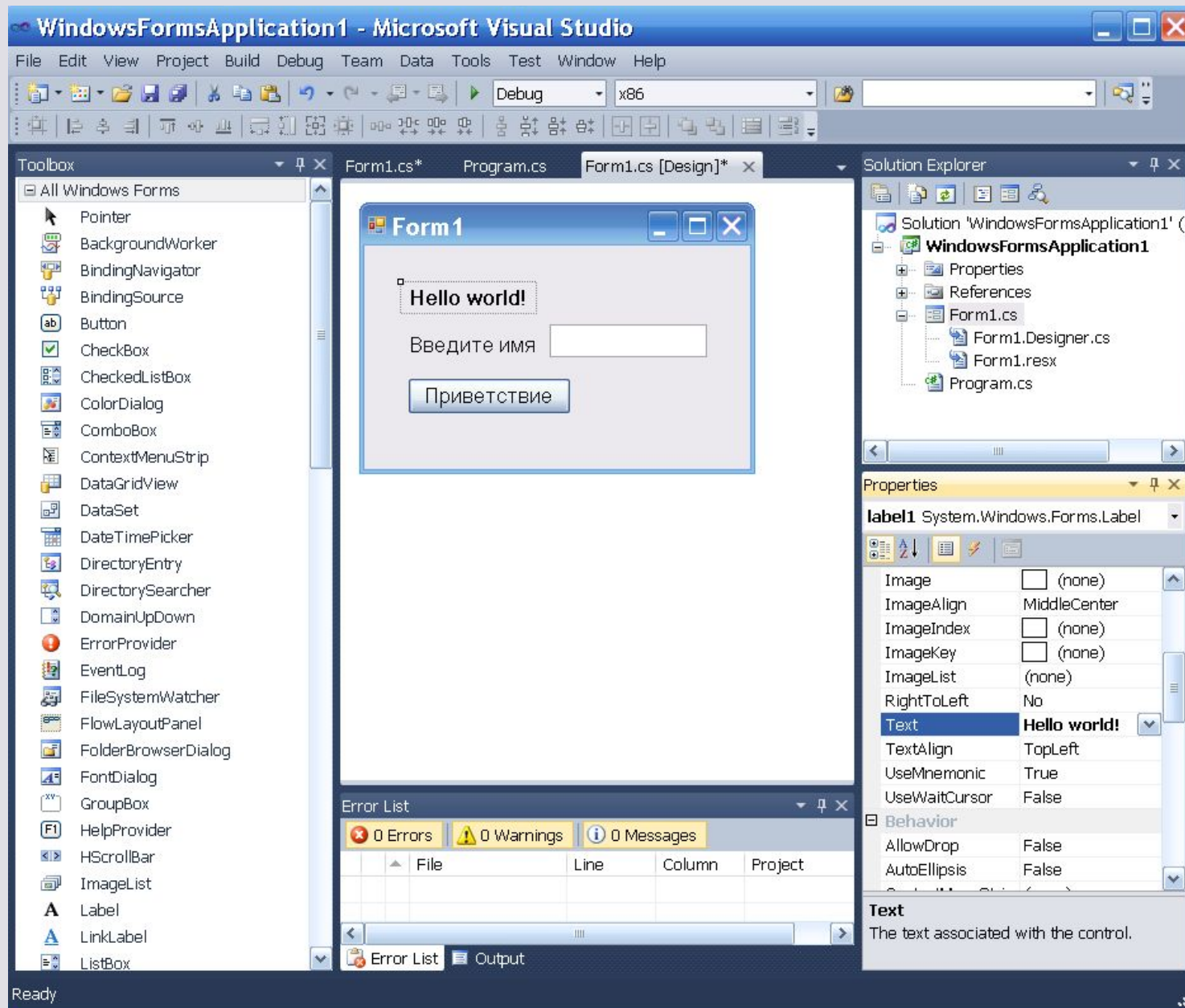
- A label 'label1' at the top left.
- A text box below 'label1'.
- A label 'label2' to the left of the text box.
- A button 'button1' at the bottom center.

The interface includes several panels:

- Toolbox:** Lists various Windows Forms controls such as PrintPreviewDialog, Process, ProgressBar, PropertyGrid, RadioButton, RichTextBox, SaveFileDialog, SerialPort, ServiceController, SplitContainer, Splitter, StatusStrip, TabControl, TableLayoutPanel, TextBox, Timer, ToolStrip, ToolStripContainer, ToolTip, TrackBar, TreeView, VScrollBar, and WebBrowser.
- Solution Explorer:** Shows the project structure for 'WindowsFormsApplication1', including 'Properties', 'References', 'Form1.cs', 'Form1.Designer.cs', 'Form1.resx', and 'Program.cs'.
- Properties:** Shows the properties for the selected 'label1' control, including BackColor, BorderStyle, Cursor, FlatStyle, Font (Microsoft Sans Ser), ForeColor, Image, ImageAlign, ImageIndex, ImageKey, ImageList, RightToLeft, and Text (label1).
- Error List:** Shows 0 Errors, 0 Warnings, and 0 Messages.

The status bar at the bottom indicates 'Ready' and the current cursor position is 31, 31 on a 35 x 13 grid.

Пример приложения



Обработчик события Click кнопки

The screenshot displays the Microsoft Visual Studio environment for a Windows Forms application named "WindowsFormsApplication1". The main design area shows a form titled "Form 1" with the text "Hello world!" and a text box containing "Введите имя". A button labeled "Приветствие" is positioned below the text box. The Solution Explorer on the right shows the project structure, including "Form1.cs" and "Program.cs". The Properties window on the right is set to "button1" and shows the "Click" event handler selected. The Error List at the bottom shows 0 errors, 0 warnings, and 0 messages.

WindowsFormsApplication1 - Microsoft Visual Studio

File Edit View Project Build Debug Team Data Tools Test Window Help

Debug x86

Toolbox

- All Windows Forms
- Pointer
- BackgroundWorker
- BindingNavigator
- BindingSource
- Button
- CheckBox
- CheckedListBox
- ColorDialog
- ComboBox
- ContextMenuStrip
- DataGridView
- DataSet
- DateTimePicker
- DirectoryEntry
- DirectorySearcher
- DomainUpDown
- ErrorProvider
- EventLog
- FileSystemWatcher
- FlowLayoutPanel
- FolderBrowserDialog
- FontDialog
- GroupBox
- HelpProvider
- HScrollBar
- ImageList
- Label
- LinkLabel
- ListBox

Form1.cs Program.cs Form1.cs [Design]

Form 1

Hello world!

Введите имя

Приветствие

Solution Explorer

- Solution 'WindowsFormsApplication1' (C#)
- WindowsFormsApplication1
 - Properties
 - References
 - Form1.cs
 - Form1.Designer.cs
 - Form1.resx
 - Program.cs

Properties

button1 System.Windows.Forms.Button

- Click
- MouseCaptureCha
- MouseClicked

Appearance

- Paint

Behavior

- ChangeUICues
- ControlAdded
- ControlRemoved
- HelpRequested
- QueryAccessibilityI
- StyleChanged
- SystemColorsChar

Click

Occurs when the component is clicked.

Error List

0 Errors 0 Warnings 0 Messages

| File | Line | Column | Project |
|------|------|--------|---------|
|------|------|--------|---------|

Ready

Обработчик события Click кнопки

The screenshot displays the Visual Studio IDE with the following components:

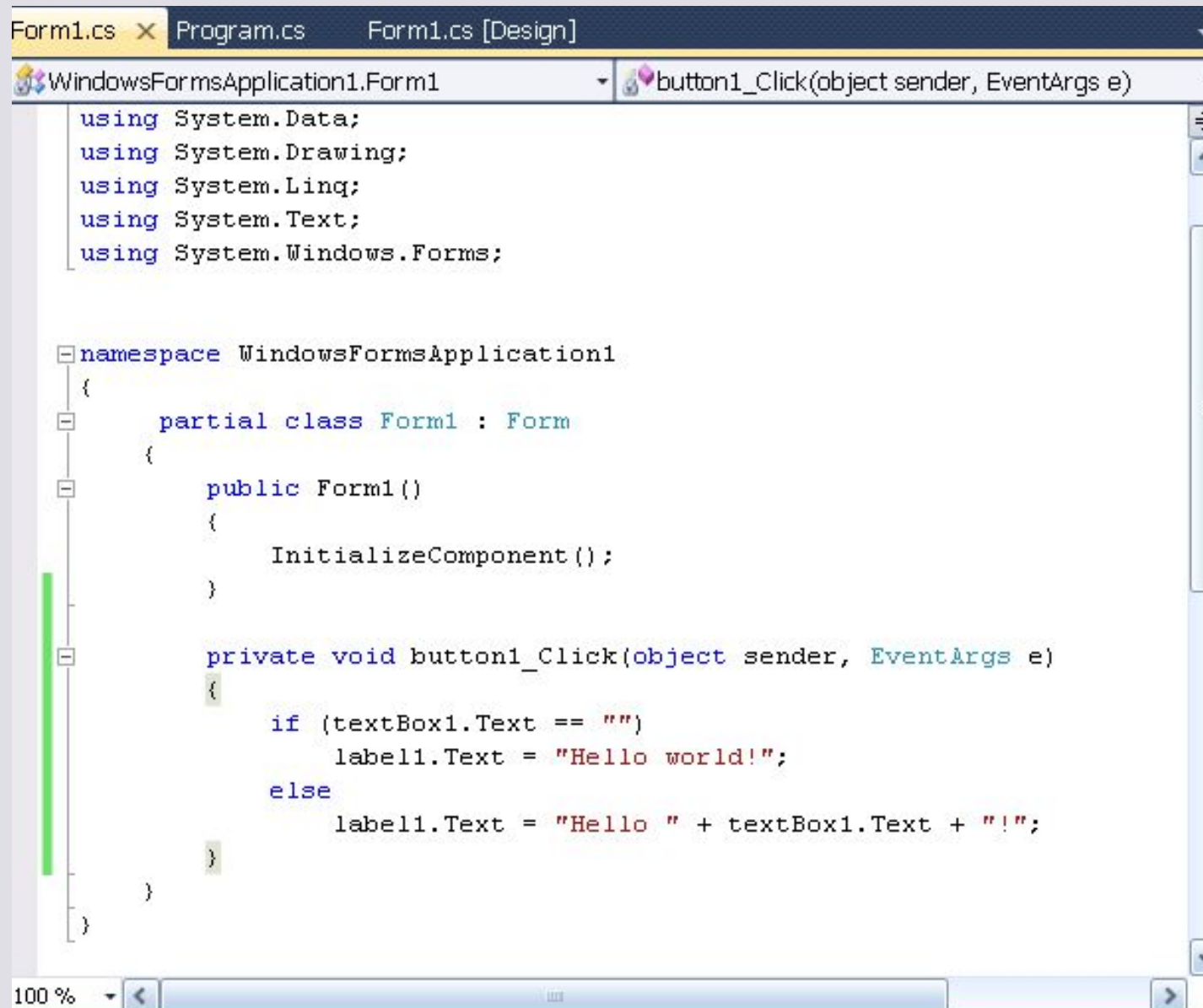
- Code Editor:** Shows the implementation of the `button1_Click` event handler for the `Form1` class. The code includes several `using` statements for system namespaces and a partial class definition for `Form1`.
- Solution Explorer:** Shows the project structure for `WindowsFormsApplication1`, including `Form1.cs`, `Form1.Designer.cs`, and `Form1.resx`.
- Properties Window:** Is currently empty.

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;

namespace WindowsFormsApplication1
{
    partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
        }
    }
}
```

Обработчик события Click кнопки



The image shows a screenshot of the Visual Studio IDE. At the top, the title bar displays 'Form1.cs x Program.cs Form1.cs [Design]'. Below the title bar, the breadcrumb navigation shows 'WindowsFormsApplication1.Form1' and 'button1_Click(object sender, EventArgs e)'. The main editor area contains the following C# code:

```
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;

namespace WindowsFormsApplication1
{
    partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            if (textBox1.Text == "")
                label1.Text = "Hello world!";
            else
                label1.Text = "Hello " + textBox1.Text + "!";
        }
    }
}
```

The code is displayed with syntax highlighting. The namespace is 'WindowsFormsApplication1'. The class 'Form1' is a partial class that inherits from 'Form'. It has a public constructor 'Form1()' that calls 'InitializeComponent()'. The event handler 'button1_Click' is a private void method that takes 'object sender' and 'EventArgs e' as parameters. It checks if 'textBox1.Text' is an empty string. If it is, it sets 'label1.Text' to 'Hello world!'. Otherwise, it sets 'label1.Text' to 'Hello ' followed by 'textBox1.Text' and '!'.