

# C# Essentials Introductie

Koen Bloemen



**DE HOGESCHOOL  
MET HET NETWERK**

Elfde-Liniestraat 24, 3500 Hasselt, [www.pxl.be](http://www.pxl.be)





- Installatie Visual Studio
- Overzicht semester
- VS IDE
- Hello World – WPF
- Hello World – console

# Installatie Visual Studio

- [www.visualstudio.com](https://www.visualstudio.com)
- Download Visual Studio Community edition

## Meet the Visual Studio family



### Visual Studio | Windows

The best comprehensive IDE for .NET and C++ developers on Windows. Fully packed with a sweet array of tools and features to elevate and enhance every stage of software development.

[Learn more >](#)

Download Visual Studio ▾

Community 2022

Professional 2022

Enterprise 2022

Free for individual developers, academic uses, and open source



### Visual Studio for Mac | Apple

A comprehensive IDE for .NET developers that's native to macOS. Includes top-notch support for web, cloud, mobile, and game development.

[Learn more >](#)

Read more about [activating your license](#)

Download Visual Studio for Mac



### Visual Studio Code | Windows, macOS, Linux

A standalone source code editor that runs on Windows, macOS, and Linux. The top pick for JavaScript and web developers, with extensions to support just about any programming language.

[Learn more >](#)

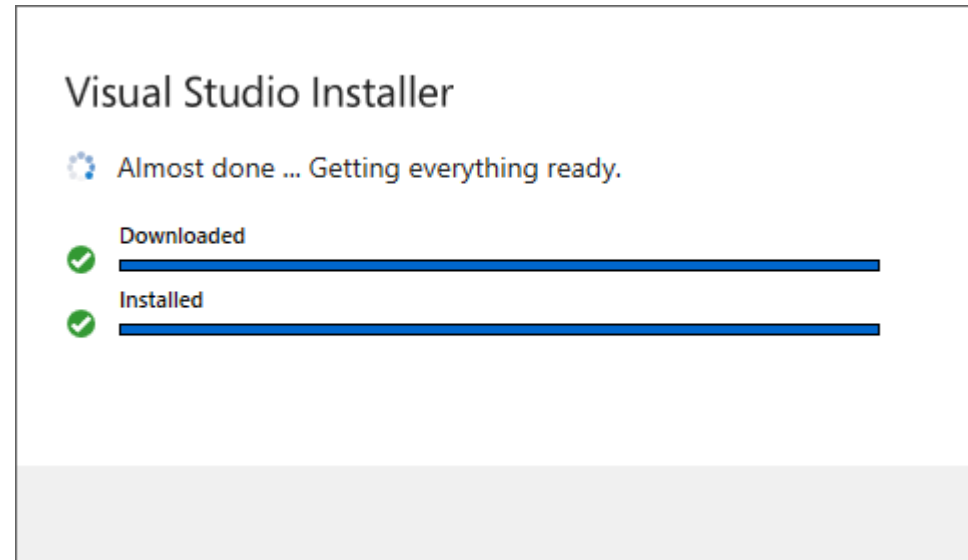
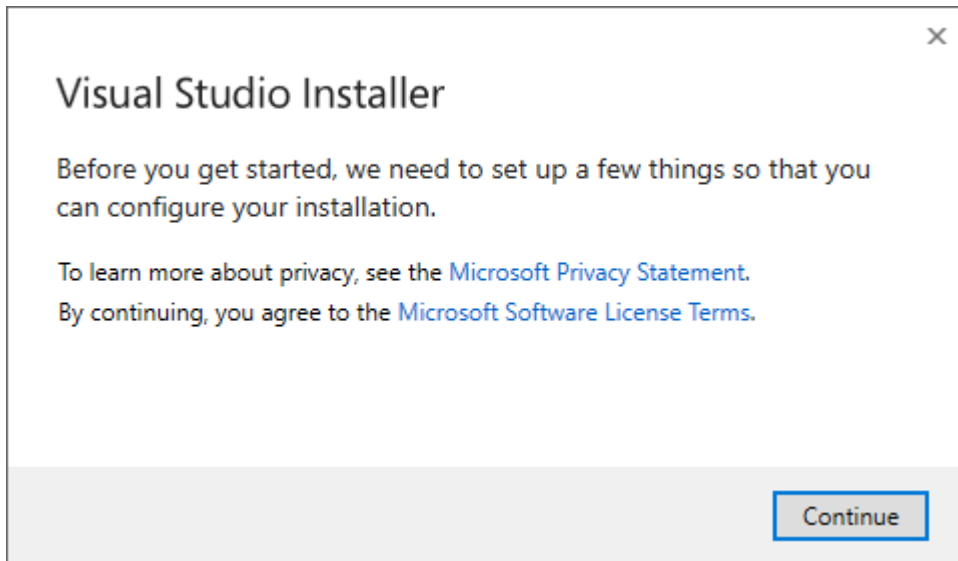
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Download Visual Studio Code ▾



# Installatie Visual Studio

- Klik *Continue*







# Installatie Visual Studio

- Selecteer *.NET desktop development*






Modifying — Visual Studio Community 2022 — 17.3.3

Workloads Individual components Language packs Installation locations

Web & Cloud (4)

-  **ASP.NET and web development** ☐  
Build web applications using ASP.NET Core, ASP.NET, HTML/JavaScript, and Containers including Docker supp...
-  **Azure development** ☐  
Azure SDKs, tools, and projects for developing cloud apps and creating resources using .NET and .NET Framework...
-  **Python development** ☐  
Editing, debugging, interactive development and source control for Python.
-  **Node.js development** ☐  
Build scalable network applications using Node.js, an asynchronous event-driven JavaScript runtime.

Desktop & Mobile (5)

-  **.NET Multi-platform App UI development** ☐  
Build Android, iOS, Windows, and Mac apps from a single codebase using C# with .NET MAUI.
-  **.NET desktop development** ☒   
Build WPF, Windows Forms, and console applications using C#, Visual Basic, and F# with .NET and .NET Frame...
-  **Desktop development with C++** ☐  
Build modern C++ apps for Windows using tools of your choice, including MSVC, Clang, CMake, or MSBuild.
-  **Universal Windows Platform development** ☐  
Create applications for the Universal Windows Platform with C#, VB, or optionally C++.

Installation details

- Visual Studio core editor
- .NET desktop development
- ▾ Data storage and processing •
  - ▾ Optional
    - ☒ SQL Server Data Tools
    - ☒ Azure Data Lake and Stream Analytics Tools
    - ☒ .NET Framework 4.7.2 development tools
    - ☐ F# desktop language support
- Individual components

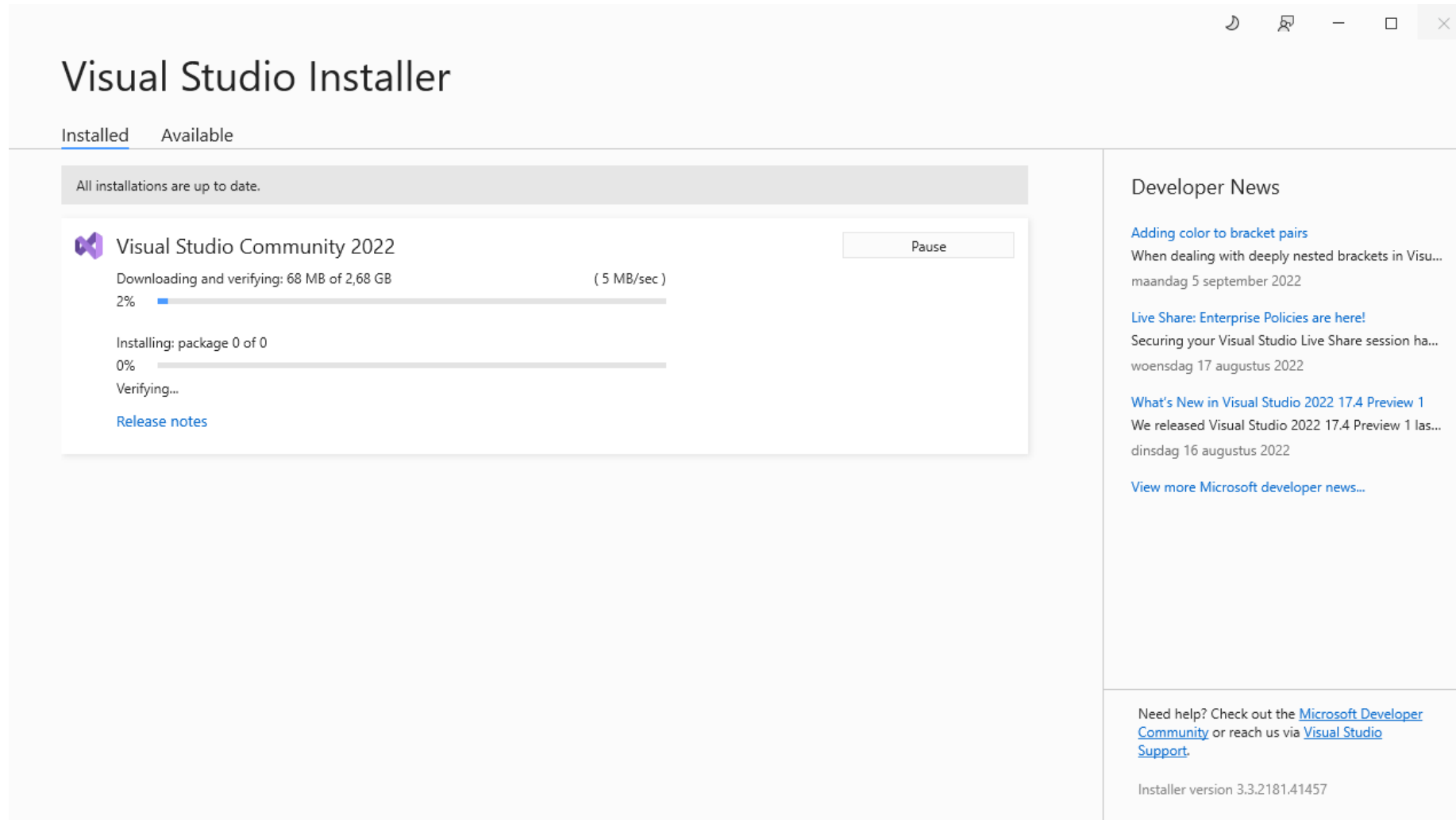
Location  
C:\Program Files\Microsoft Visual Studio\2022\Community

By continuing, you agree to the [license](#) for the Visual Studio edition you selected. We also offer the ability to download other software with Visual Studio. This software is licensed separately, as set out in the [3rd Party Notices](#) or in its accompanying license. By continuing, you also agree to those licenses.

Total space required 135 GB

Install while downloading ▾ [Modify](#)

# Installatie Visual Studio



The screenshot shows the Visual Studio Installer window. At the top, the title bar reads "Visual Studio Installer". Below the title bar, there are two tabs: "Installed" (selected) and "Available". The main content area shows a message: "All installations are up to date." Below this, there is a section for "Visual Studio Community 2022". It shows the download progress: "Downloading and verifying: 68 MB of 2,68 GB" at "2%" with a progress bar. The download speed is "( 5 MB/sec )". There is a "Pause" button next to the progress bar. Below the download progress, it shows "Installing: package 0 of 0" at "0%" and "Verifying...". A link for "Release notes" is provided. On the right side, there is a "Developer News" section with three articles: "Adding color to bracket pairs", "Live Share: Enterprise Policies are here!", and "What's New in Visual Studio 2022 17.4 Preview 1". At the bottom right, there is a link for "Need help? Check out the Microsoft Developer Community" and the installer version "3.3.2181.41457".

Visual Studio Installer

Installed Available

All installations are up to date.

Visual Studio Community 2022

Downloading and verifying: 68 MB of 2,68 GB ( 5 MB/sec )

2%

Installing: package 0 of 0

0%

Verifying...

[Release notes](#)

Pause

Developer News

[Adding color to bracket pairs](#)  
When dealing with deeply nested brackets in Visu...  
maandag 5 september 2022

[Live Share: Enterprise Policies are here!](#)  
Securing your Visual Studio Live Share session ha...  
woensdag 17 augustus 2022

[What's New in Visual Studio 2022 17.4 Preview 1](#)  
We released Visual Studio 2022 17.4 Preview 1 las...  
dinsdag 16 augustus 2022

[View more Microsoft developer news...](#)

Need help? Check out the [Microsoft Developer Community](#) or reach us via [Visual Studio Support](#).

Installer version 3.3.2181.41457

# Installatie Visual Studio

## Visual Studio

Welcome!

Connect to all your developer services.

Sign in to start using your Azure credits, publish code to a private Git repository, sync your settings, and unlock the IDE.

[Learn more](#)

Sign in

No account? [Create one!](#)

[Not now, maybe later.](#)

# Installatie Visual Studio

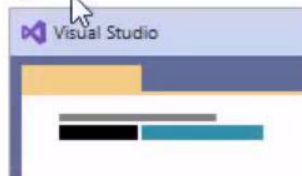
## Visual Studio

Start with a familiar environment

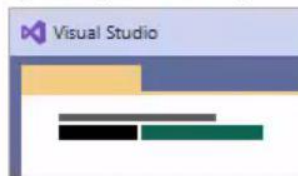
Development Settings: General

Choose your color theme

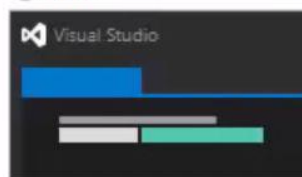
☒ Blue



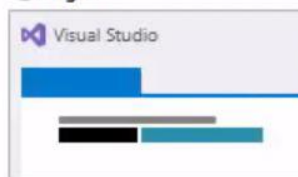
☐ Blue (Extra Contrast)



☐ Dark



☐ Light



You can always change these settings later.

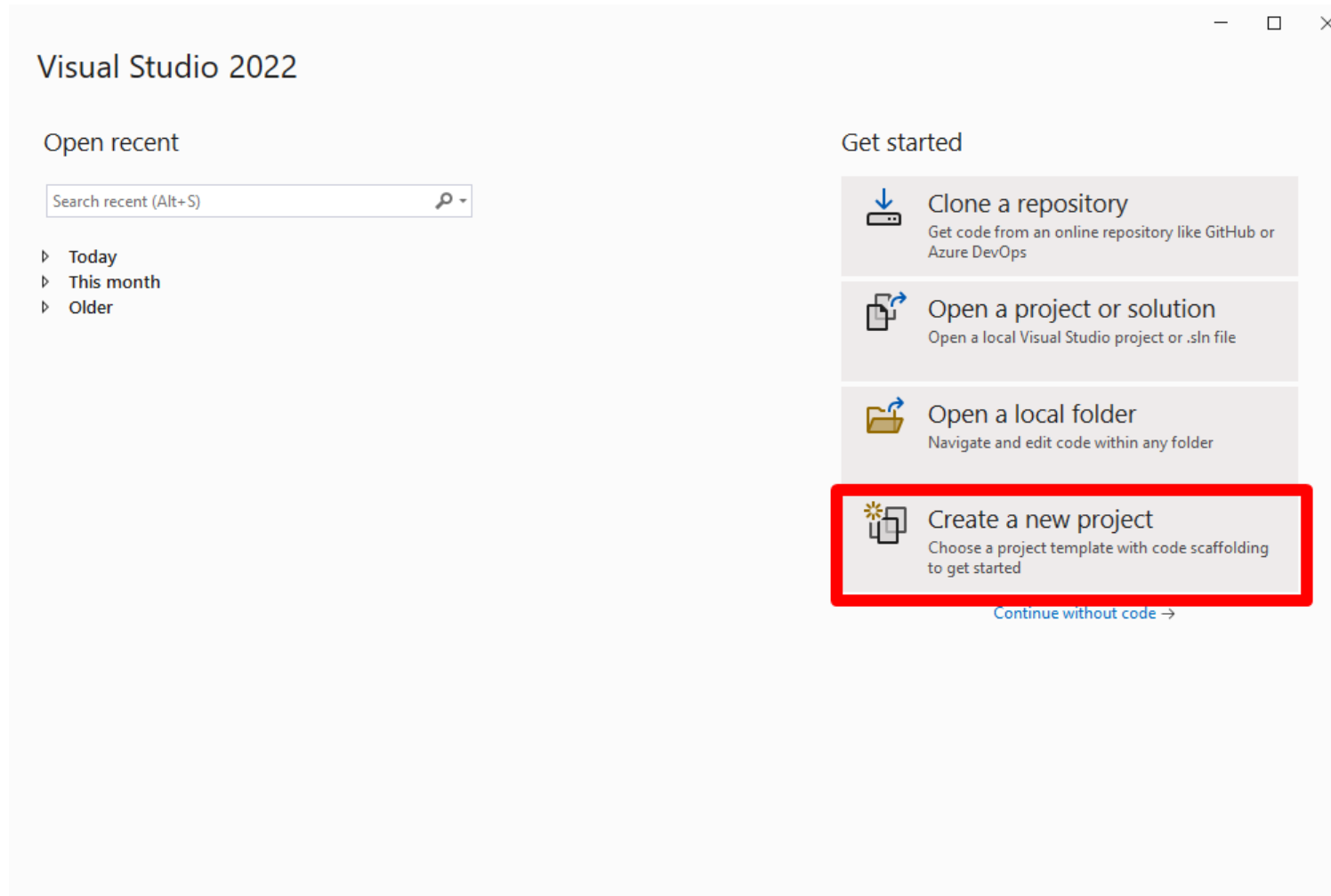
Start Visual Studio



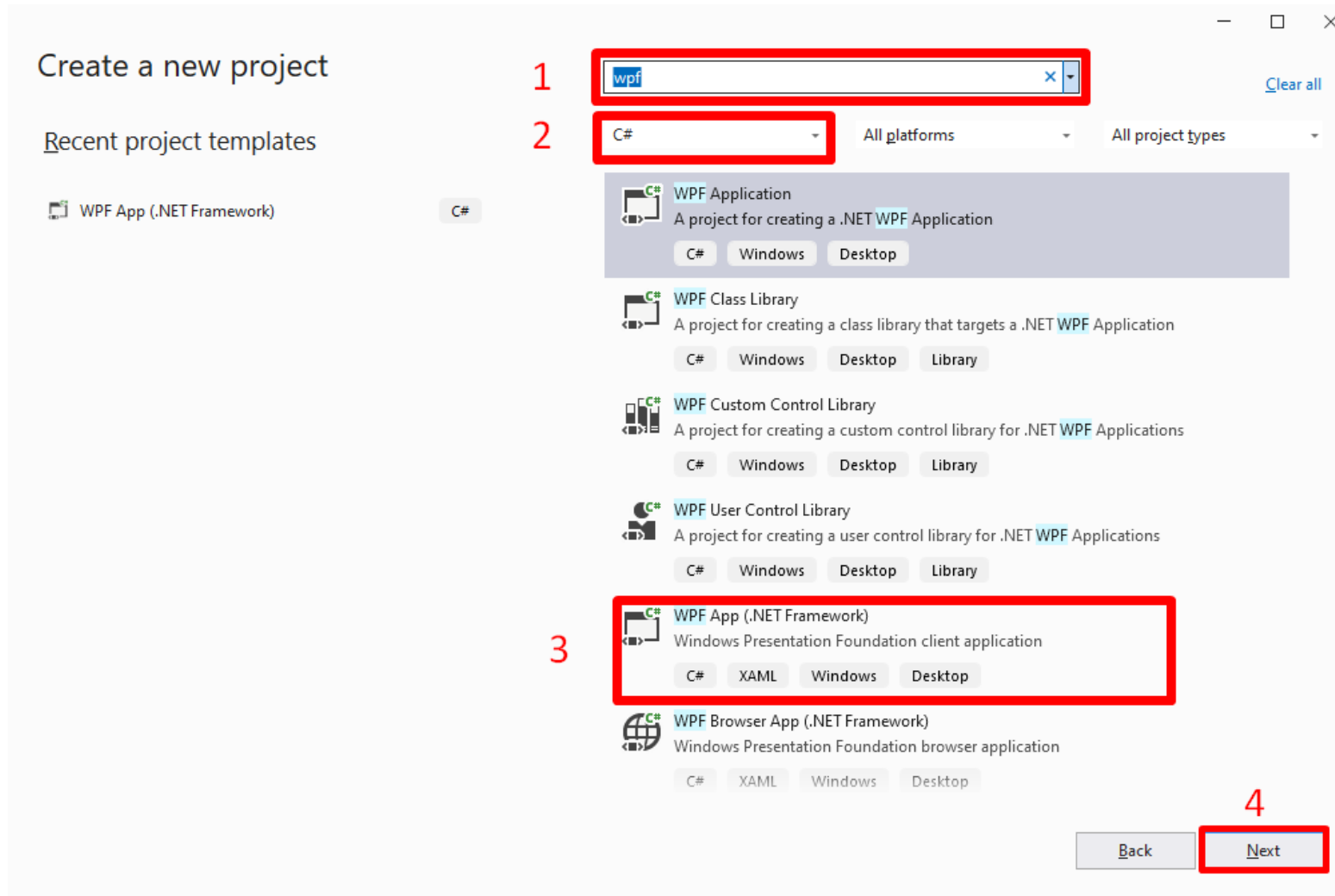
# Overzicht semester

- Eigen applicaties maken met WPF en console
- Variabelen en berekeningen met operatoren
- Conversies
- Veel gebruikte klassen: String, Tekst, DateTime, ...
- Beslissingen: if en switch
- Herhaling: for, while, do en foreach
- Event procedures en parameters
- Arrays en generieke collecties
- Fouten opsporen: de gestructureerde foutafhandeling
- Programmeerstijl en naamconventies
- Elementaire WPF-besturingselementen

# Visual Studio IDE



# Visual Studio IDE



# Visual Studio IDE

Configure your new project

WPF App (.NET Framework) C# XAML Windows Desktop

Project name  
HelloWorld

Location  
C:\Users\20003926\source\repos

Solution name ⓘ  
HelloWorld

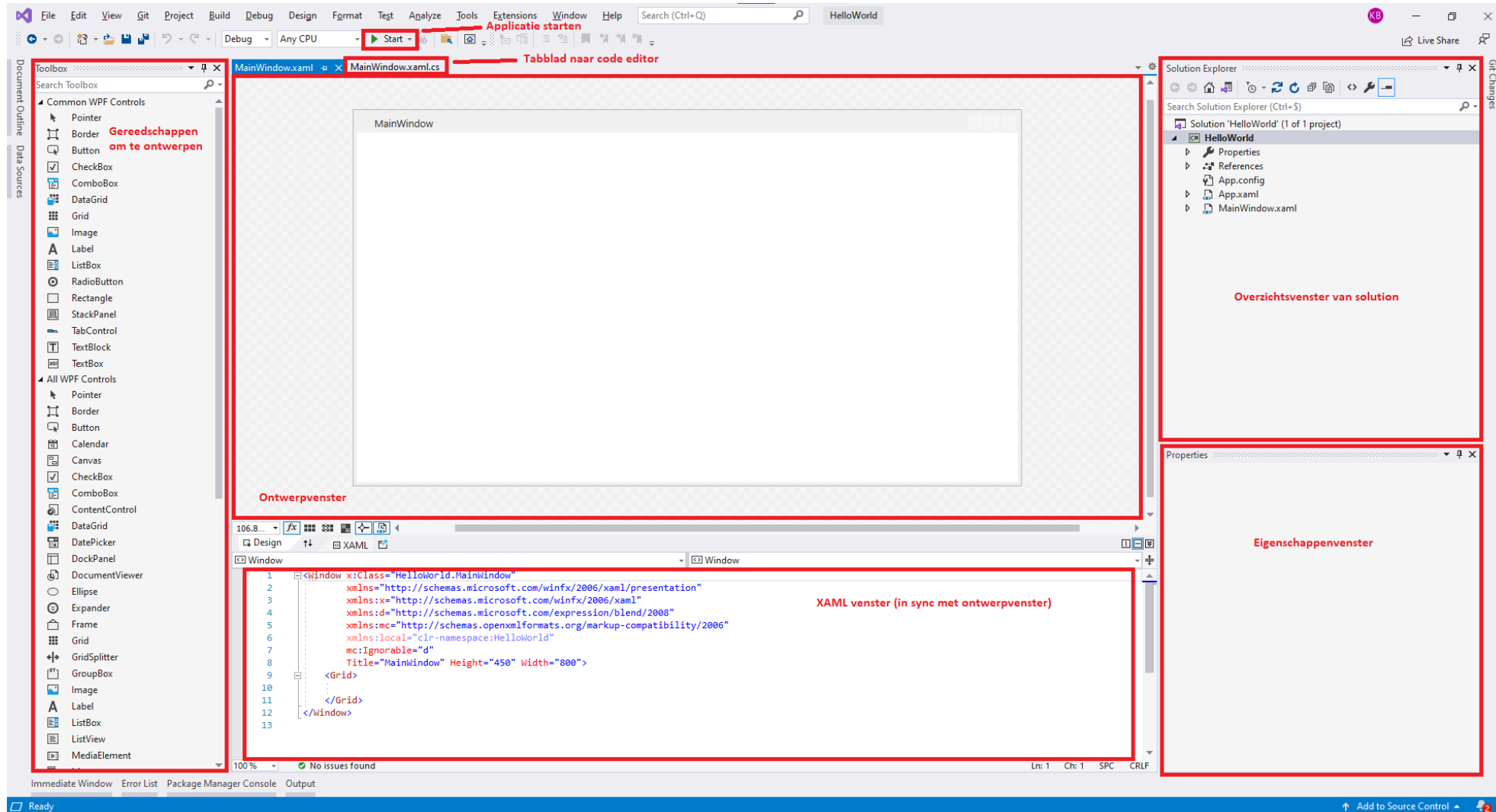
☐ Place solution and project in the same directory

Framework  
.NET Framework 4.7.2

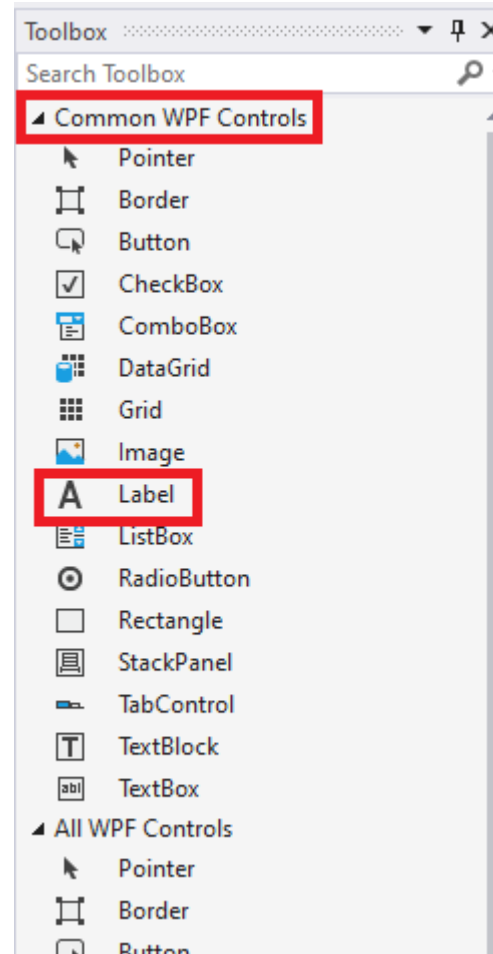
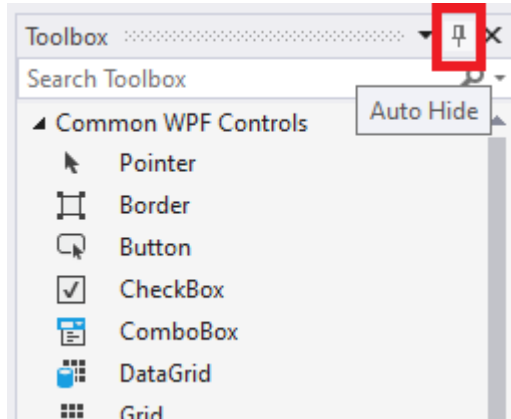
Back Create



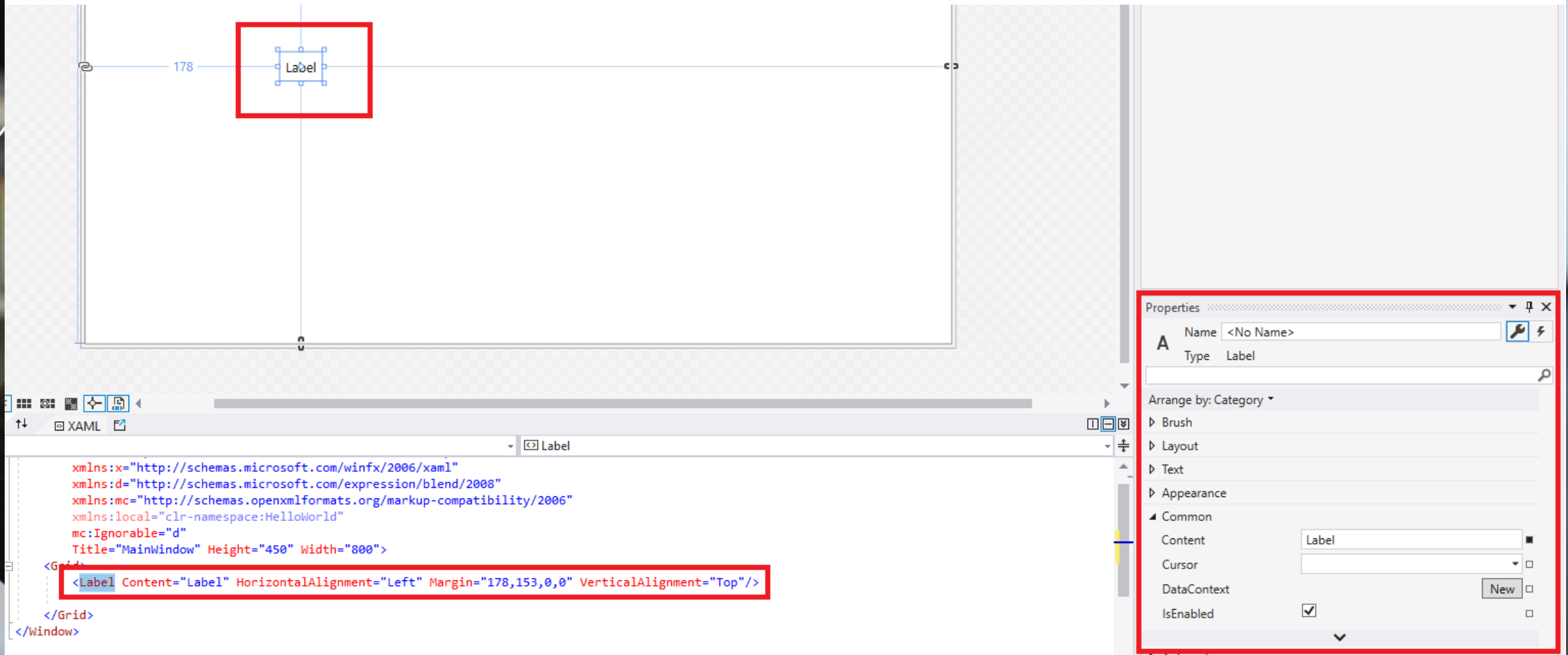
# Visual Studio IDE



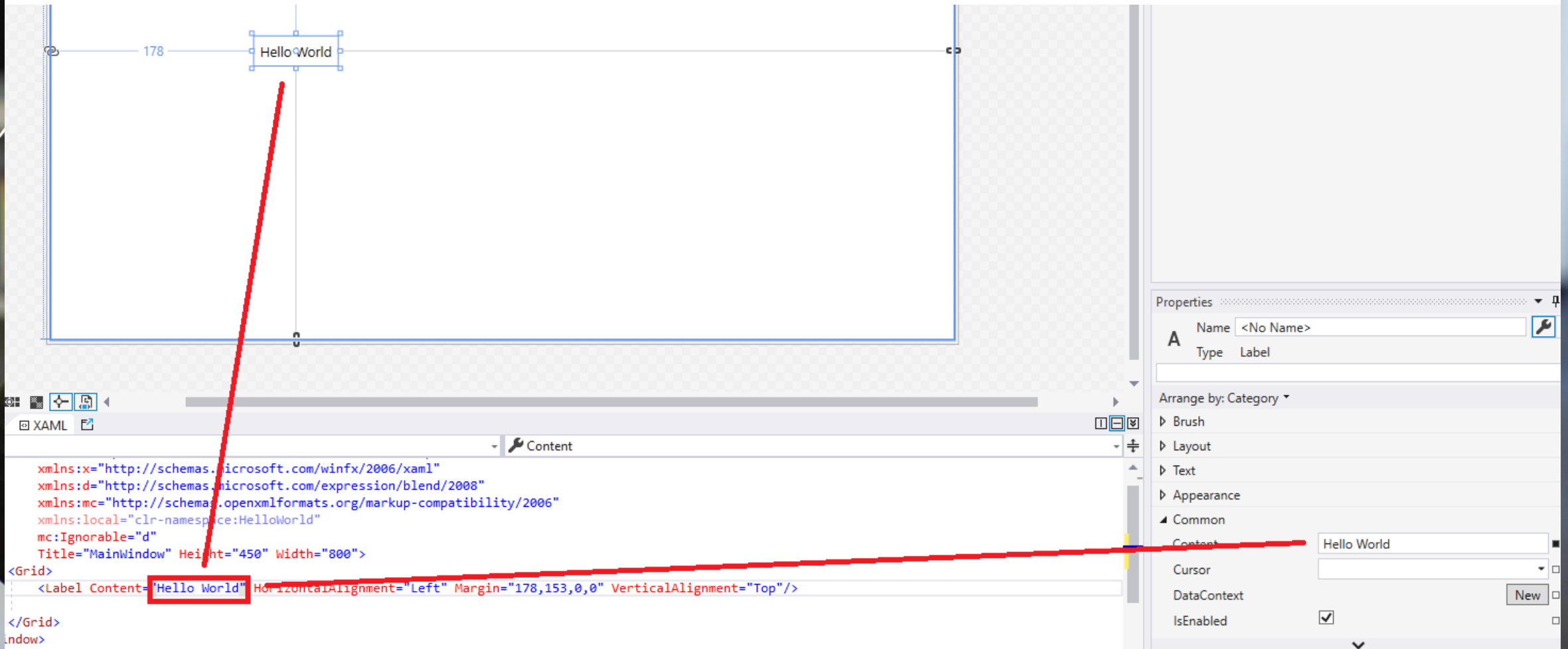
# Visual Studio IDE



# Visual Studio IDE

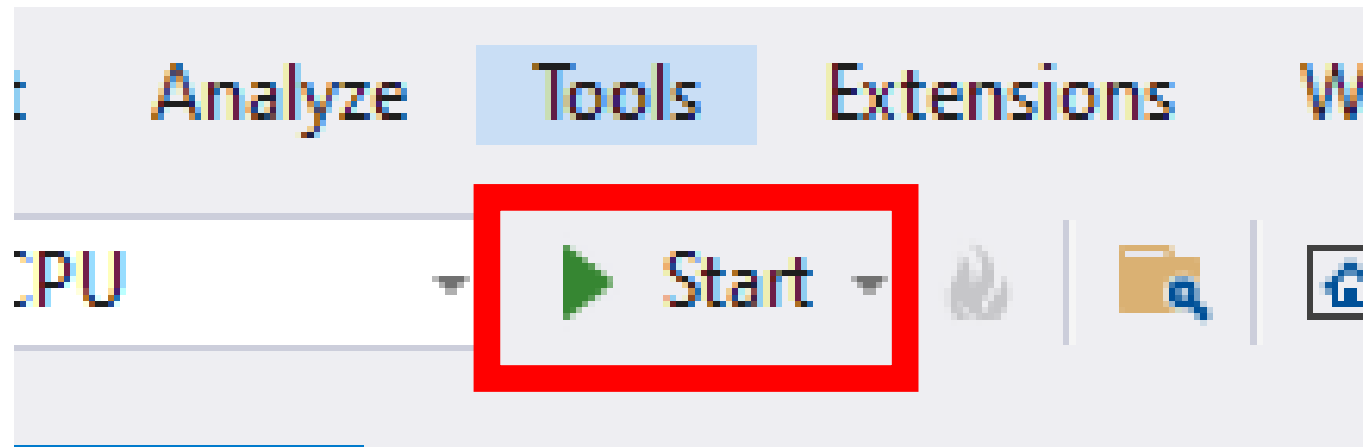


# Visual Studio IDE

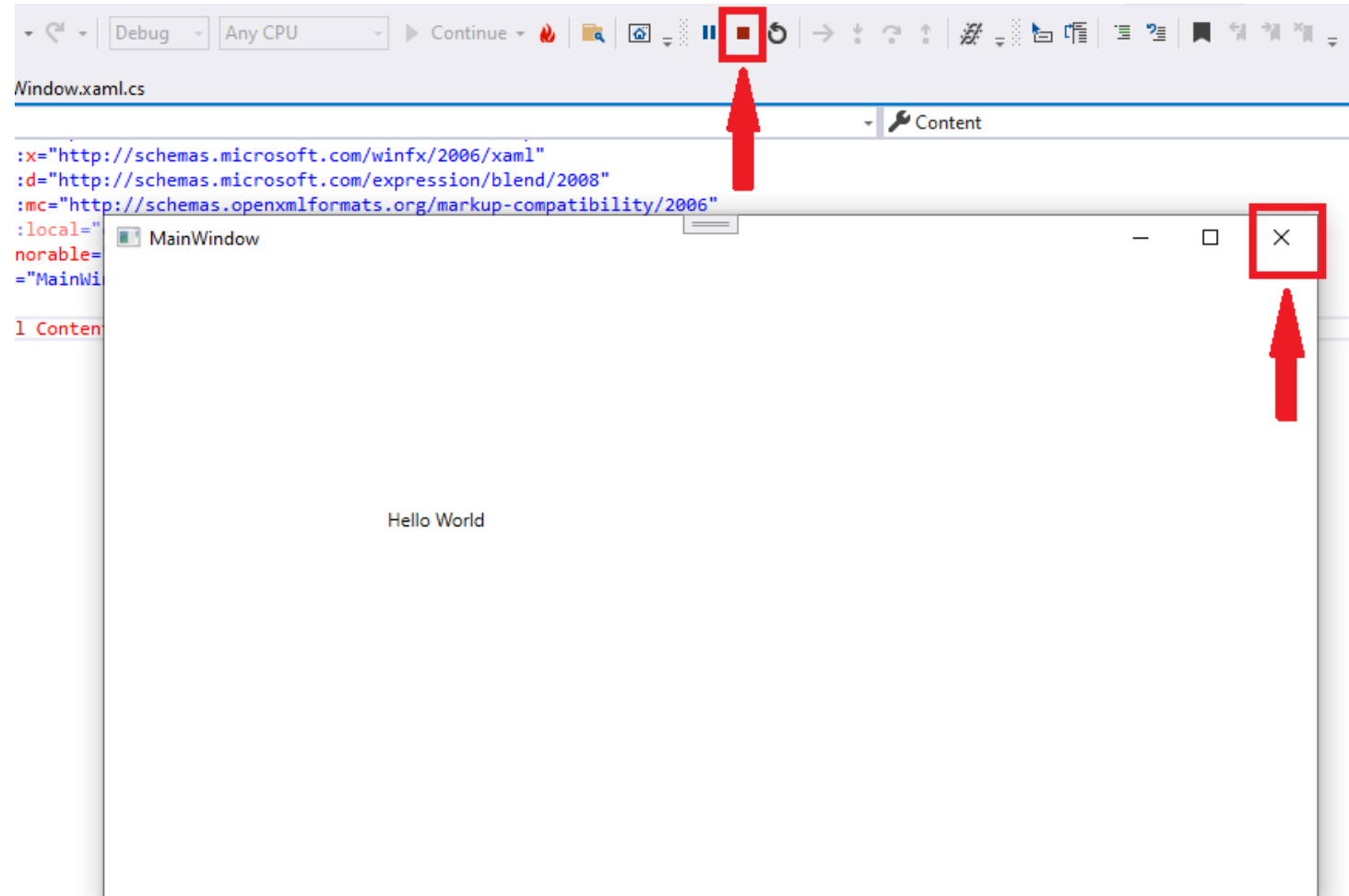




# Visual Studio IDE



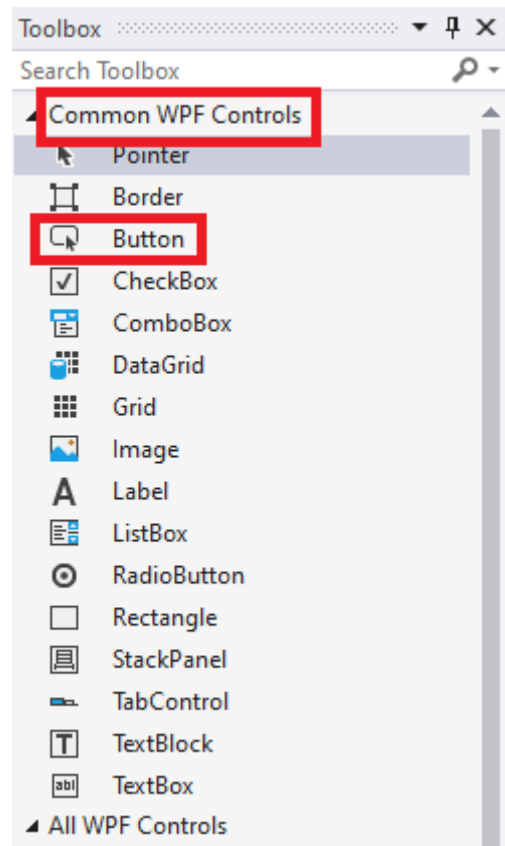
# Visual Studio IDE



# Hello World

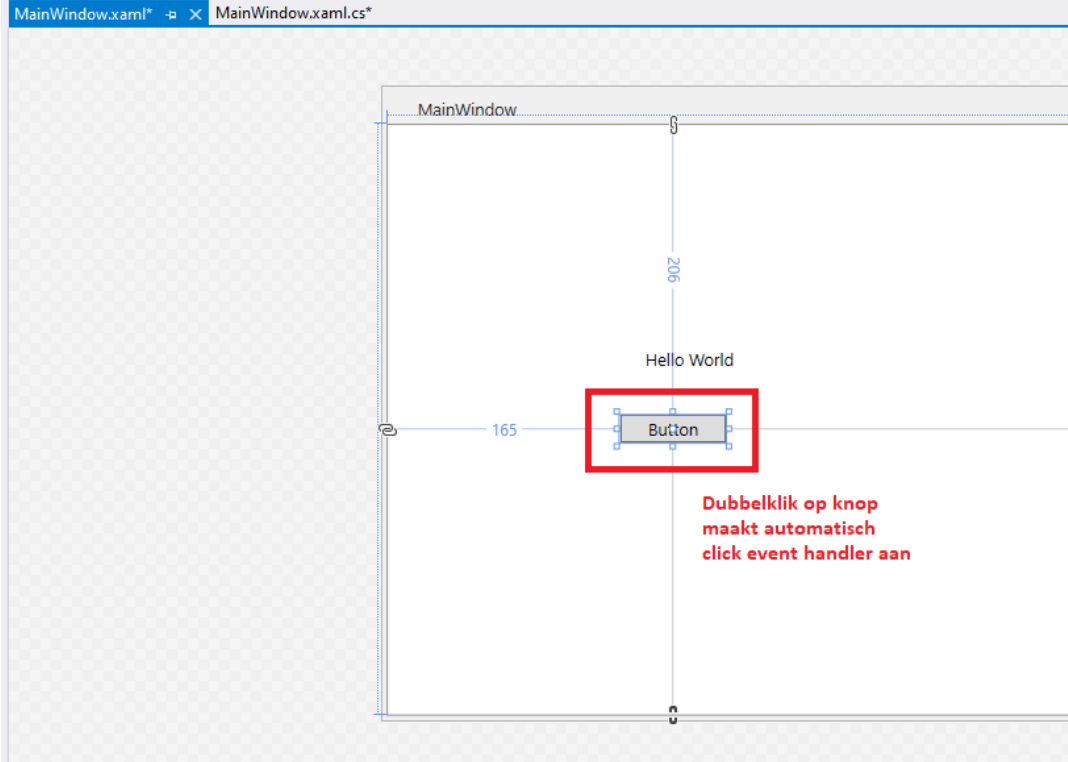
```
Title="MainWindow" Height="450" Width="800">  
Grid>  
  <Label Name="lblHelloWorld" Content="Hello World" HorizontalAlignment="Left" Margin="178,153,0,0" VerticalAlignment="Top"/>  
/Grid>
```

# Hello World





# Hello World



```
MainWindow.xaml*  MainWindow.xaml.cs*  X
C# HelloWorld  HelloWorld.MainWindow

6  using System.Windows;
7  using System.Windows.Controls;
8  using System.Windows.Data;
9  using System.Windows.Documents;
10 using System.Windows.Input;
11 using System.Windows.Media;
12 using System.Windows.Media.Imaging;
13 using System.Windows.Navigation;
14 using System.Windows.Shapes;
15
16 namespace HelloWorld
17 {
18     /// <summary>
19     /// Interaction logic for MainWindow.xaml
20     /// </summary>
21     2 references
22     public partial class MainWindow : Window
23     {
24         0 references
25         public MainWindow()
26         {
27             InitializeComponent();
28         }
29
30         0 references
31         private void Button_Click(object sender, RoutedEventArgs e)
32         {
33         }
34     }
}
```

# Hello World

```
28  
29  
30  
31  
32  
33  
34
```

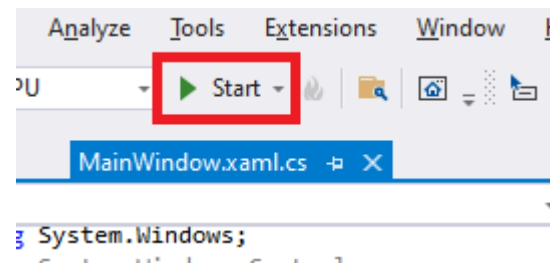
0 references

```
private void Button_Click(object sender, RoutedEventArgs e)  
{  
    lbl  
}
```

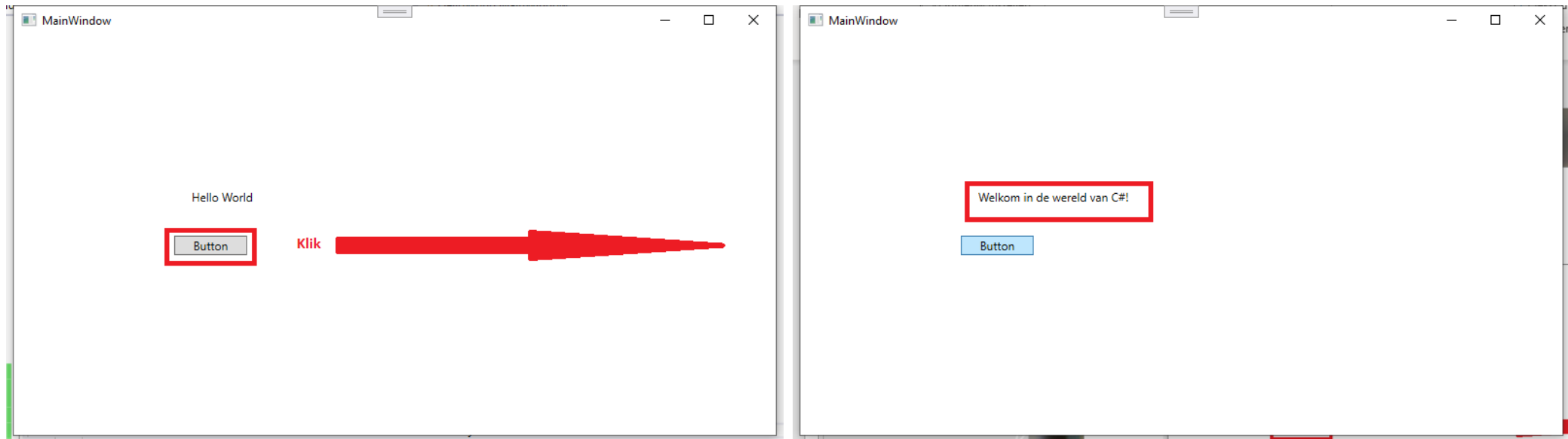
lblHelloWorld (field) Label MainWindow.lblHelloWorld

```
28  
29  
30  
31  
32  
33  
34
```

```
private void Button_Click(object sender, RoutedEventArgs e)  
{  
    lblHelloWorld.Content = "Welkom in de wereld van C#!";  
}
```

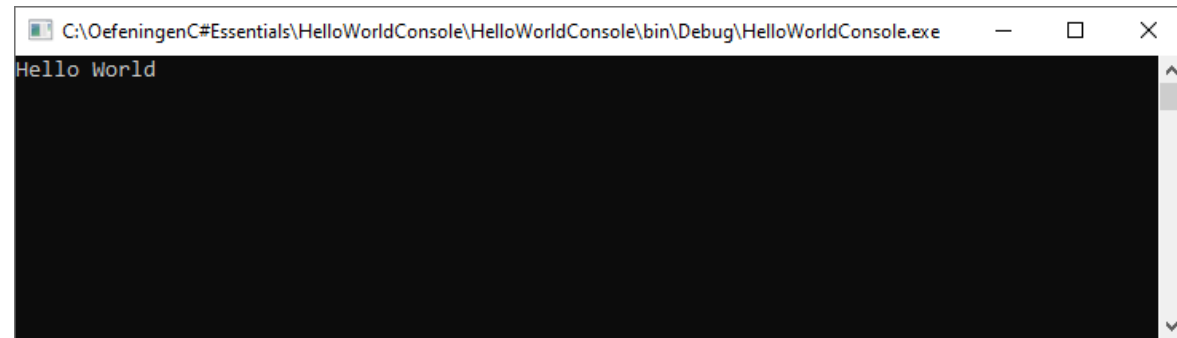


# Hello World



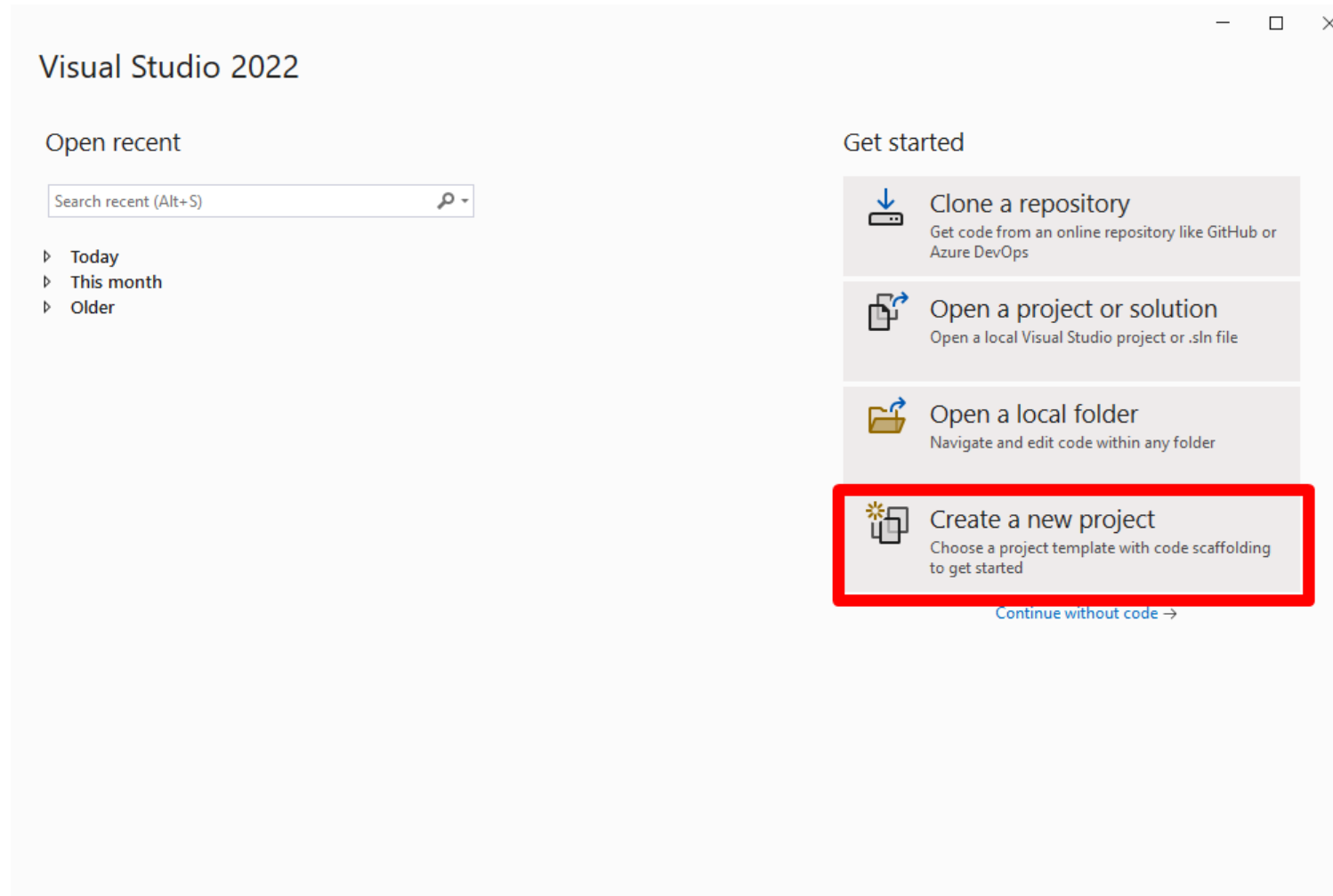
# Console applicatie

- Toepassing zonder vensters en componenten
  - Geen grafische interface (GUI)
  - Geen labels, tekstvelden, knoppen, ...
  - Puur tekst
- Gebruikt om stukken code *snel* te testen
- Sneller dan WPF applicatie, maar (veel) beperkter in mogelijkheden
- Ook gebruikt om de syntax (C#) te leren





# Visual Studio IDE



# Console applicatie

Create a new project

Recent project templates

WPF App (.NET Framework) C#

1 console

2 C# All platforms All project types

3 Console App  
A project for creating a command-line application that can run on .NET on Windows, Linux and macOS  
C# Linux macOS Windows Console

Console App (.NET Framework)  
A project for creating a command-line application  
C# Windows Console

Other results based on your search

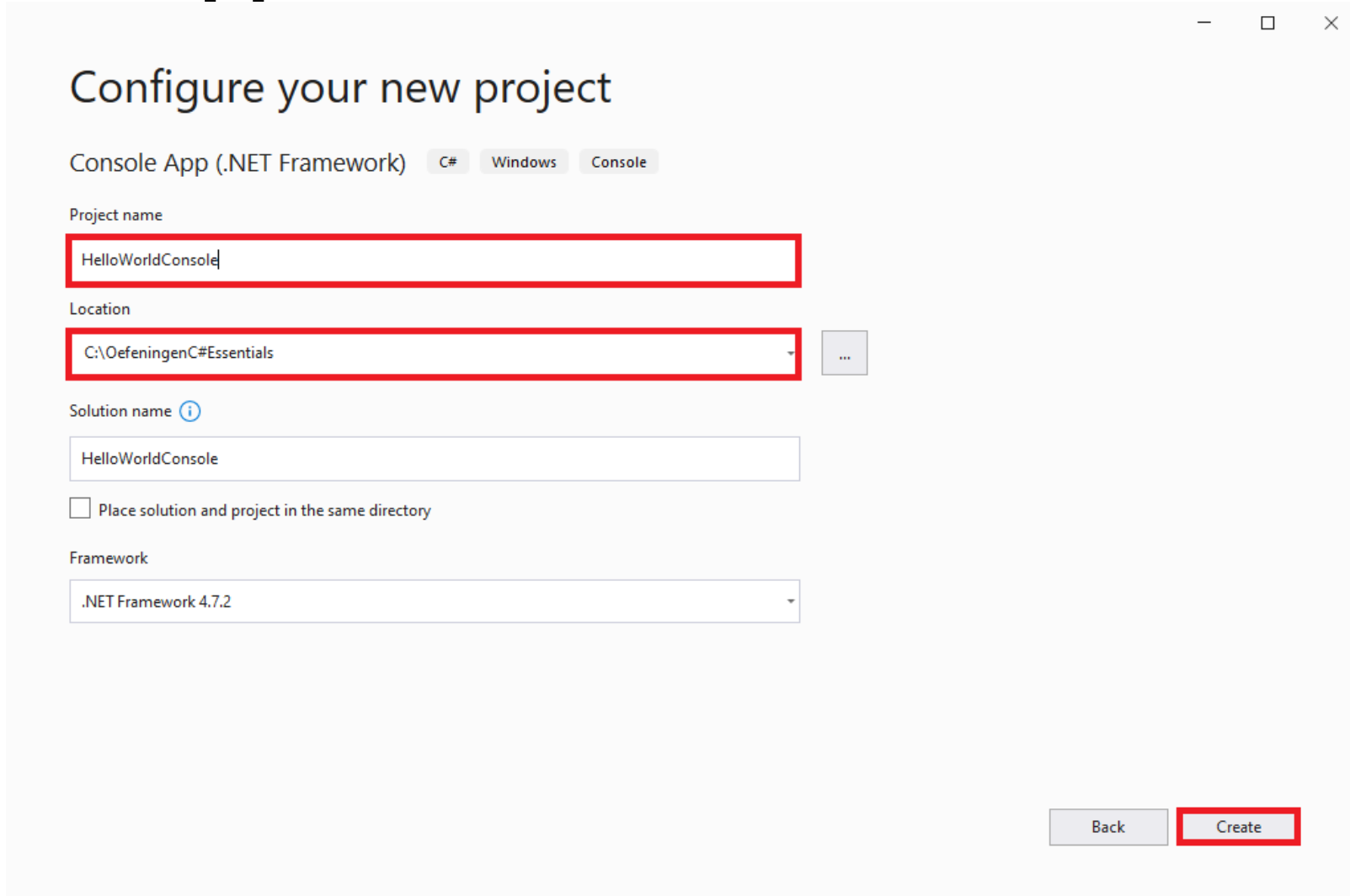
VB Console App  
A project for creating a command-line application that can run on .NET on Windows, Linux and macOS  
Visual Basic Linux macOS Windows Console

VB Console App (.NET Framework)  
A project for creating a command-line application  
Visual Basic Windows Console

F# Console App  
A project for creating a command-line application that can run on .NET on Windows, Linux and macOS

4 Back Next

# Console applicatie



Configure your new project

Console App (.NET Framework) C# Windows Console

Project name

HelloWorldConsole

Location

C:\OefeningenC#Essentials

Solution name ⓘ

HelloWorldConsole

☐ Place solution and project in the same directory

Framework

.NET Framework 4.7.2

Back Create

# Console applicatie

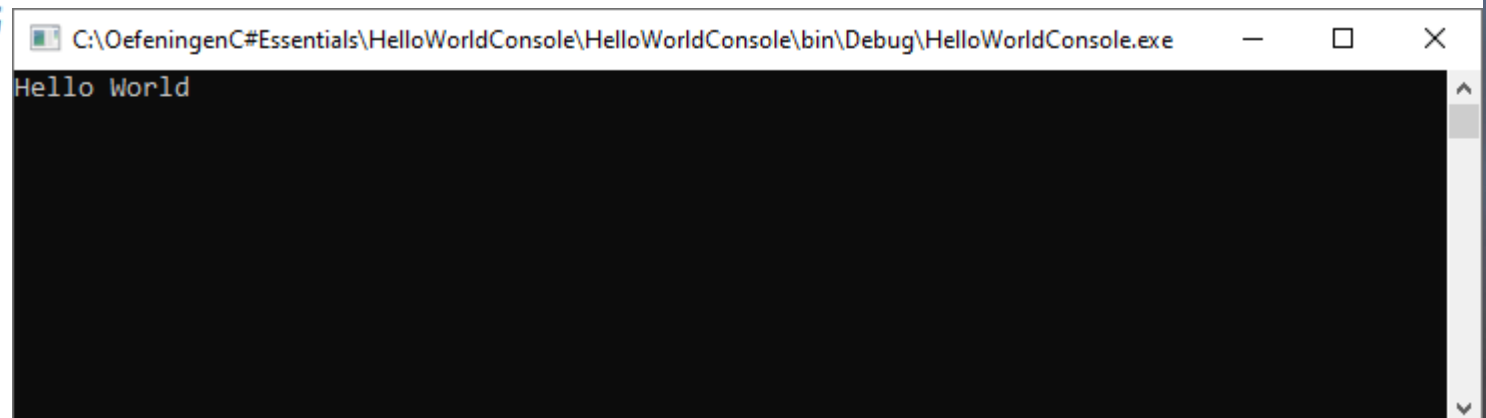
- Main is het startpunt van een console applicatie

```
namespace HelloWorldConsole
{
    0 references
    internal class Program
    {
        0 references
        static void Main(string[] args)
        {
        }
    }
}
```

# Console applicatie

- `Console.WriteLine("")` om tekst naar de console te sturen
- `Console.ReadLine()` om tekst van de console te lezen

```
namespace HelloWorldConsole
{
    0 references
    internal class Program
    {
        0 references
        static void Main(string[] args)
        {
            Console.WriteLine("Hello World");
            Console.ReadLine();
        }
    }
}
```



# Console applicatie

- Voorbeeld met naam en getal inlezen en afdrucken



# Console applicatie

```
static void Main(string[] args)
{
    string naam;
    int getal;

    //Inlezen
    Console.Write("Geef een naam: ");
    naam = Console.ReadLine();
    Console.Write("Geef een getal: ");
    getal = int.Parse(Console.ReadLine());

    //Afdruk
    Console.WriteLine("Afdruk");
    Console.WriteLine("-----");
    Console.WriteLine($"Naam: {naam}\t Getal: {getal}");
    Console.WriteLine("Druk op enter om af te sluiten...");
    Console.ReadLine();
}
```

```
Geef een naam: PXL
Geef een getal: 55
Afdruk
-----
Naam: PXL      Getal: 55
Druk op enter om af te sluiten...
```

# Naming conventions

- camelCasing
  - Begint met een kleine letter
  - Elk woord in de samenstelling begint met een hoofdletter
  - Gebruikt voor variabelen en functieparameters
  - bijv.: naamCursist, rekeningBank, studentNaamPerAfdeling
- PascalCasing
  - Ook wel UppercamelCasing genoemd
  - Gebruikt voor functionamen, class definities, e.d.

# Gestructureerd analytisch denken

- Fase 1: Probleemanalyse
- Fase 2: Oplossingsstrategie
- Fase 3: Algoritme
- Fase 4: Programmeren
- Fase 5: Testen
- Fase 6: Documenteren

# Fase 1: Probleemanalyse

- Wat moet er gebeuren?
- Hoe pak ik dit aan?
- Wat is het probleem?
- Over welke gegevens beschik ik?
- Welk resultaat wordt gevraagd?

## *Fase 1 Probleemanalyse*

Gegeven: /

- Gevraagd:
- Wijzig tekst in "Welkom programmeurs"
  - Berichtenvenster "Hallo netwerkbeheer"
  - Wijzig tekst in "Muis zweeft over label"

## Fase 2: Oplossingsstrategie

- De basisstructuren voor het programma worden hier gemaakt.
- Hoe los ik het probleem op?
- Welke verfijnde technieken kan ik hiervoor gebruiken?

### *Fase 2 Oplossingsstrategie*

- Klik op 'Wijzigen': druk tekst "Welkom programmeurs" in label
- Klik op 'Bericht': berichtenvenster "Hallo netwerkbeheer"
- Muis over label: druk tekst "Muis zweeft over label" in label

# Fase 3: Algoritme

- Voorschrift
- Stapsgewijs opgebouwd
- Een algoritme:
  - is duidelijk, ondubbelzinnig en volledig gedefinieerd
  - is vrij zijn van redundantie
  - heeft uitgeschreven invoer- en uitvoerspecificaties
  - is gestructureerd
  - moet eindigen

## *Fase 3 Pseudocode*

Begin *BtnWijzigen\_*

druk "Welkom programmeurs" (*LblHallo*)

Einde

Begin *BtnBericht\_Click*

druk "Hallo netwerkbeheer" (*berichtenvenster*)

Einde

Begin *LblTekst\_MouseEnter*

druk "Muis zweeft over label" (*LblHallo*)

Einde

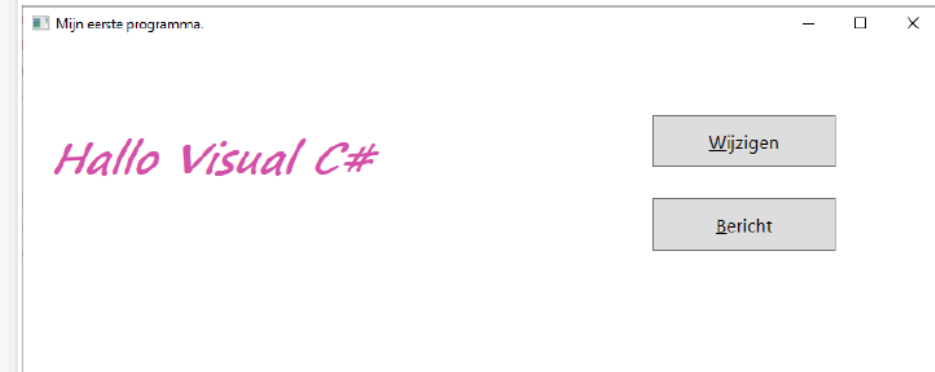


# Fase 4: Programmeren

- Het effectief maken van het programma in bijv. C#

## Fase 4 Programmeren

### 4.1 Ontwerpfase/ Visual programming



### 4.2 Programmeerfase / Code programming

```
private void ButtonWijzigen_Click(object sender, RoutedEventArgs e)
{
    LabelHallo.Content = "Welkom programmeurs!";
}

private void LabelHallo_MouseEnter(object sender, MouseEventArgs e)
{
    LabelHallo.Content= "Muis zweeft over label.";
}

private void ButtonBericht_Click(object sender, RoutedEventArgs e)
{
    // Berichtenvenster oproepen.
    MessageBox.Show("Hallo 1PRO C/D", "Berichtenvenster");
}
```

# Fase 5: Testen

- Op basis van testgegevens
- Kan met hulp-tools, zoals unit testing, e.d.

# Fase 6: Documenteren

- Commentaarregels om (stukken) code te verduidelijken
- Nuttig voor toekomstige aanpassingen
- Noodzakelijk bij werken in ontwikkelteams
- Documentatie/handleiding kan hieruit gegenereerd worden

```
private void ButtonBericht_Click(object sender, RoutedEventArgs e)
{
    // Berichtenvenster oproepen.
    MessageBox.Show("Hallo 1PRO C/D", "Berichtenvenster");
}
```

# Oefeningen 1-2