

C# Essentials Introductie

Koen Bloemen



**DE HOGESCHOOL
MET HET NETWERK**

Elfde-Liniestraat 24, 3500 Hasselt, www.pxl.be





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

Installatie Visual Studio

- 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.

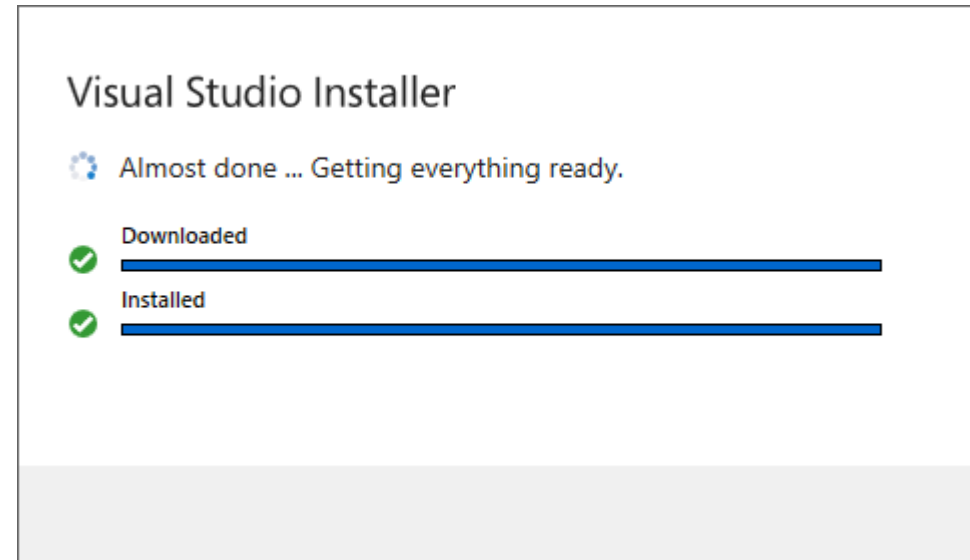
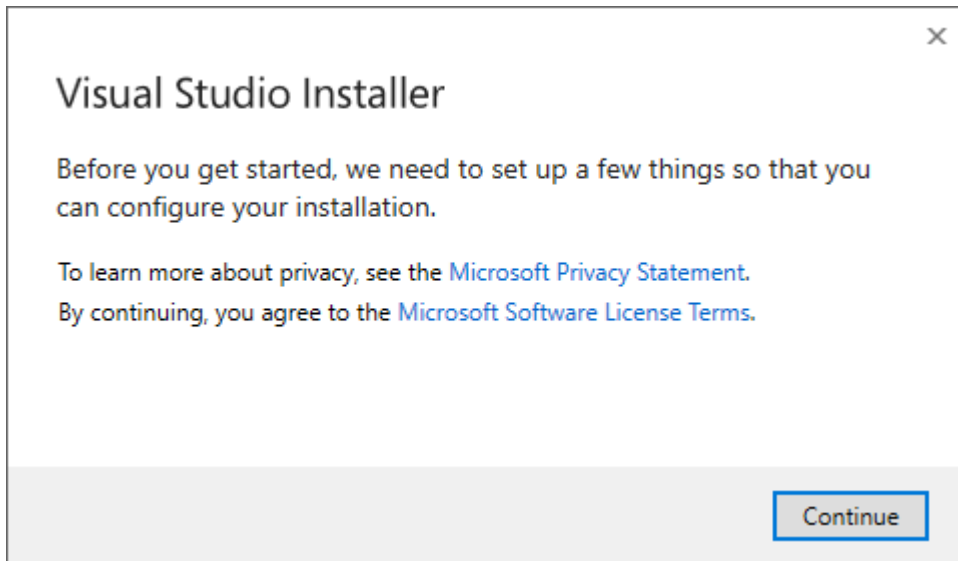
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Download Visual Studio Code ▾

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

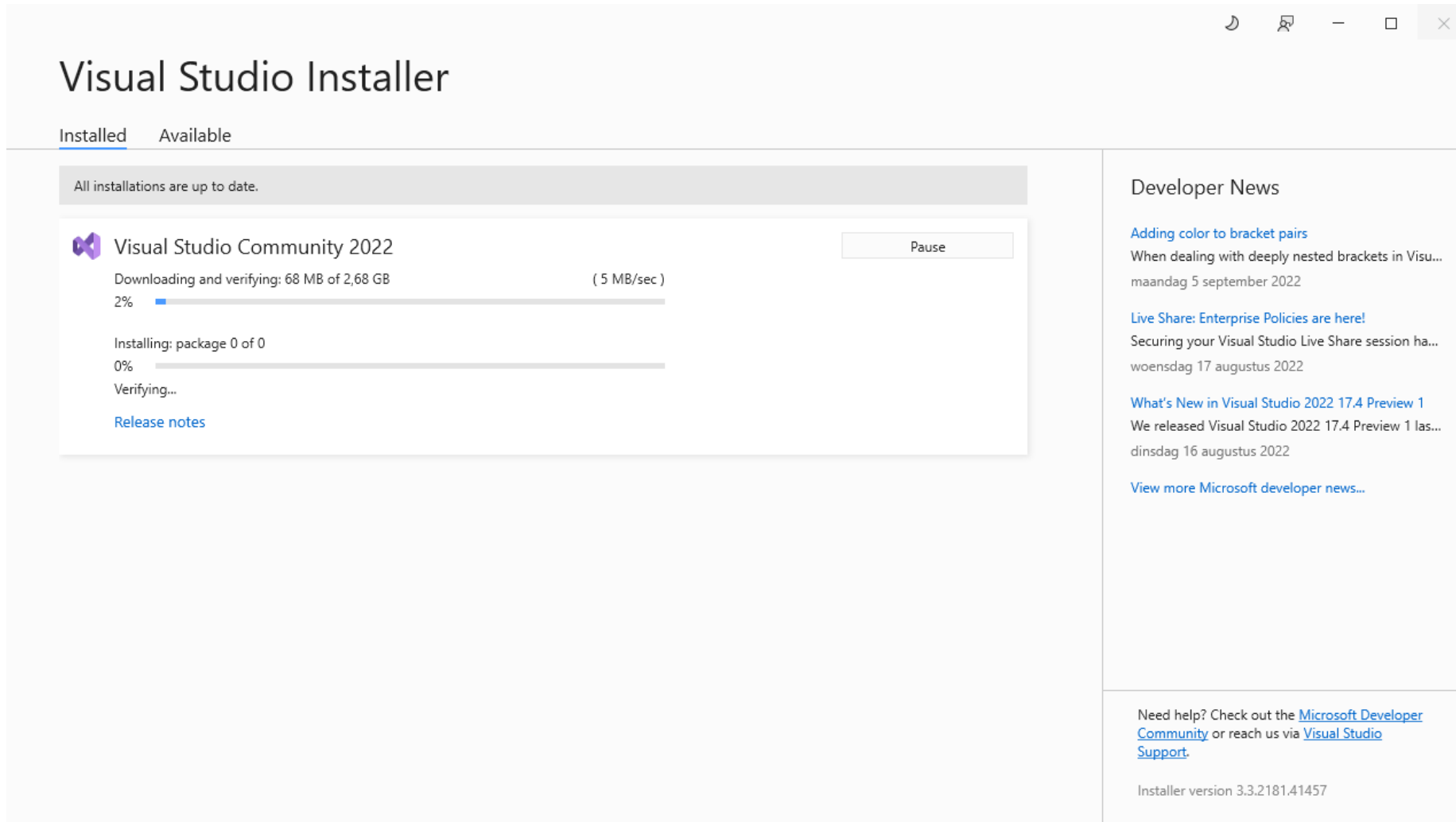
Location
C:\Program Files\Microsoft Visual Studio\2022\Community

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. 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. Below the download progress, it says "Installing: package 0 of 0" at "0%" with a progress bar. It also says "Verifying...". There is a link for "Release notes".

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

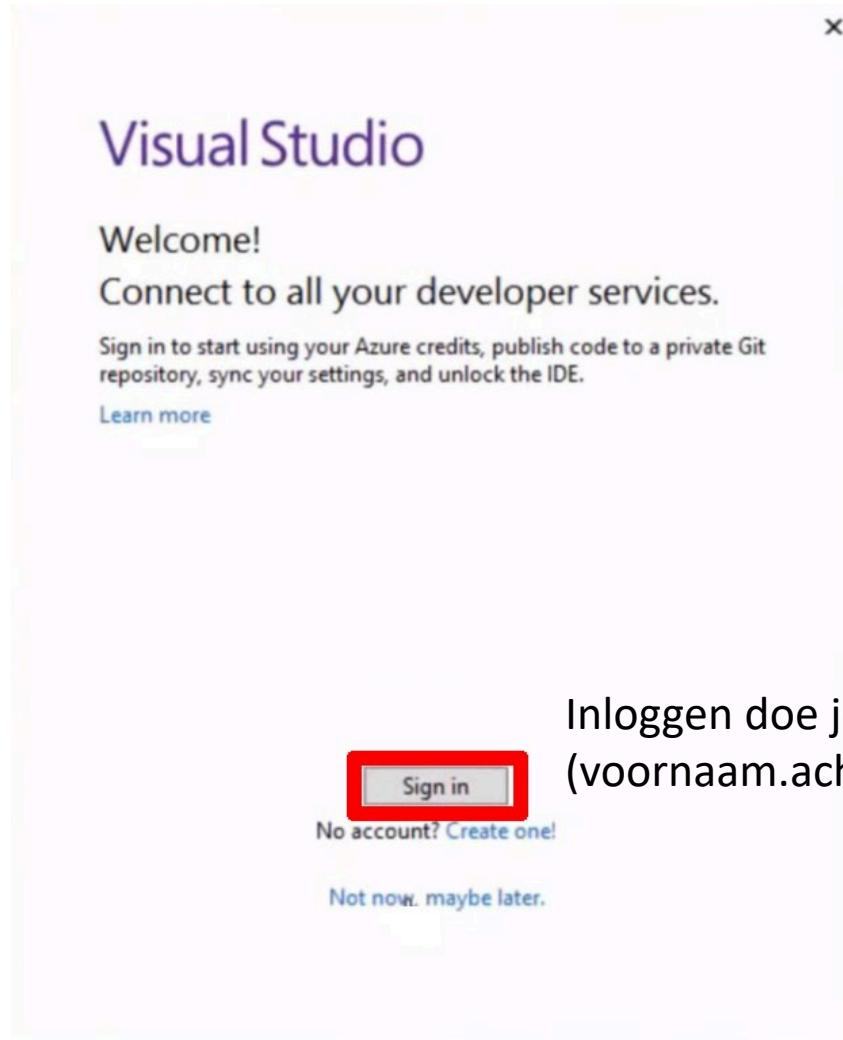
[What's New in Visual Studio 2022 17.4 Preview 1](#)
We released Visual Studio 2022 17.4 Preview 1 las...
dinsdag 16 augustus 2022

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

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

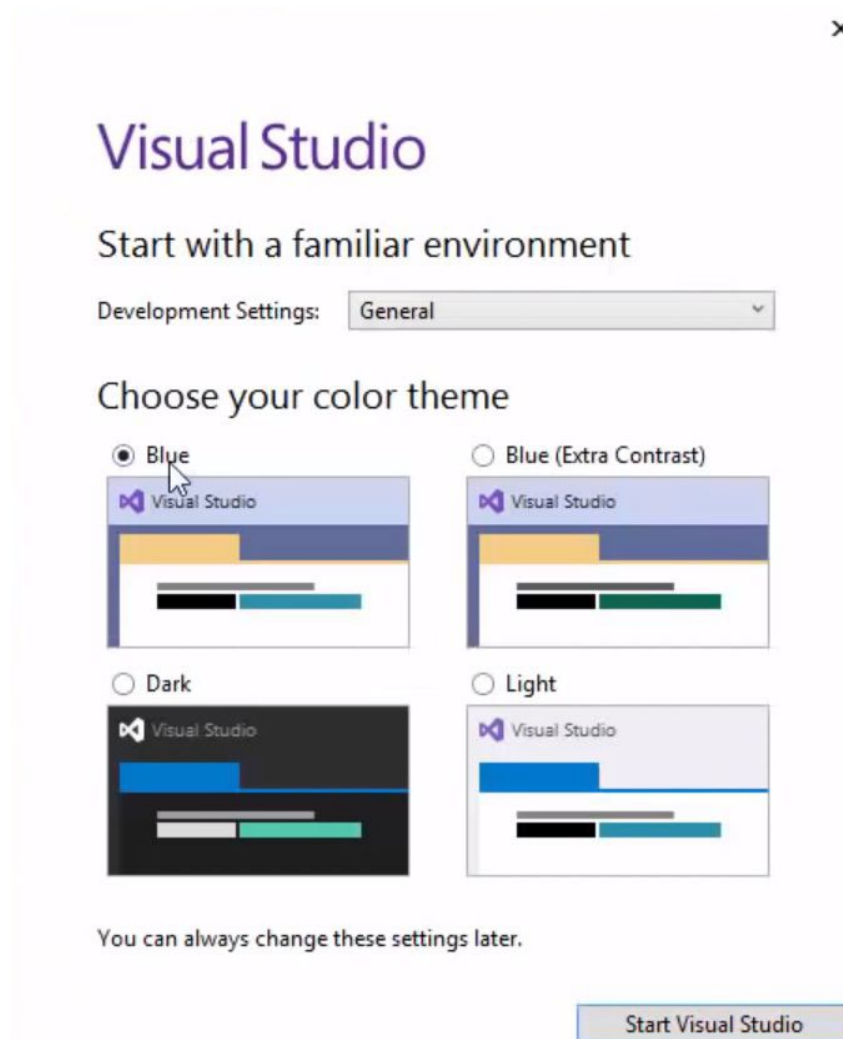
Installer version 3.3.2181.41457

Installatie Visual Studio



Inloggen doe je met je studenten PXL account
(voornaam.achternaam@student.pxl.be)

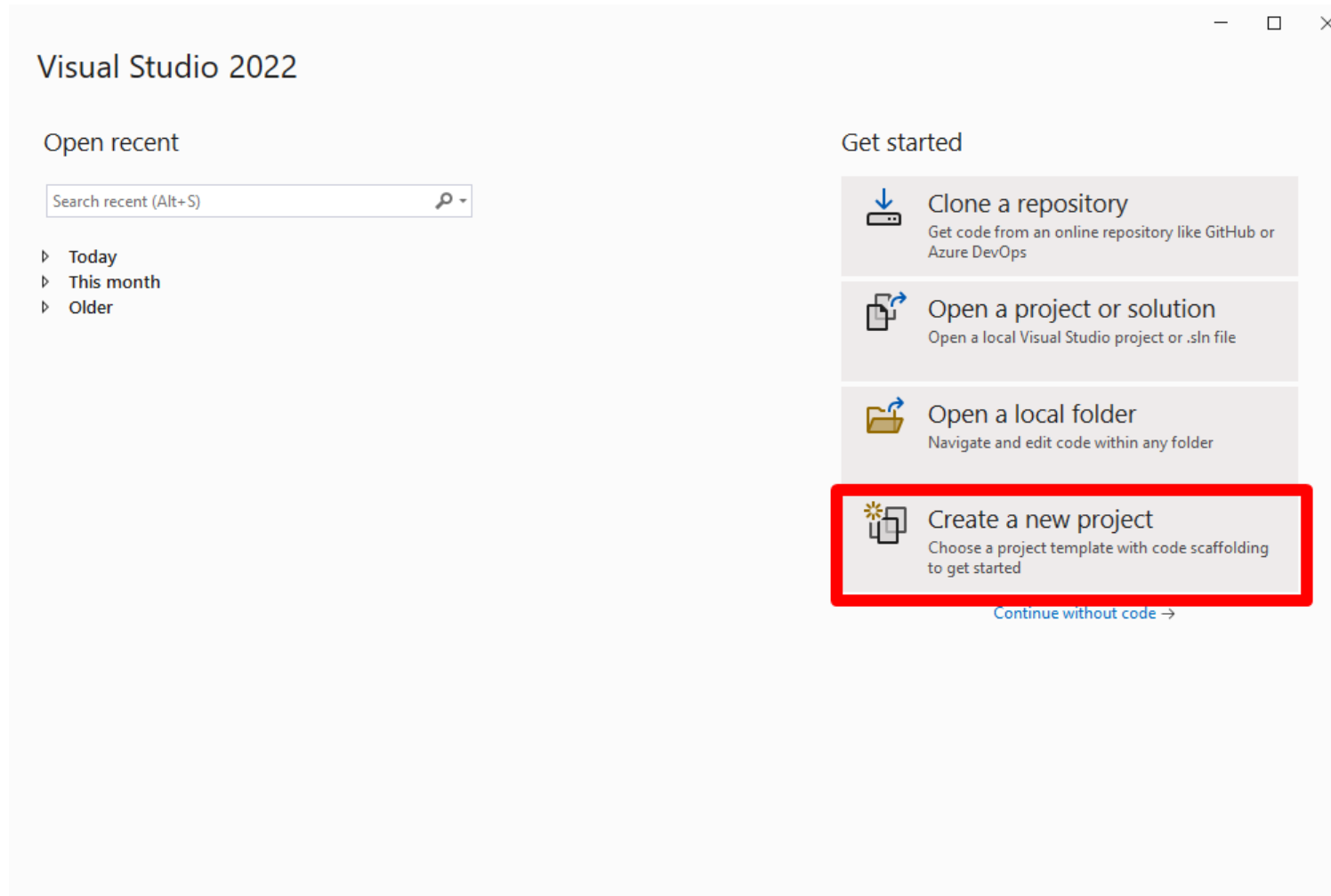
Installatie Visual Studio



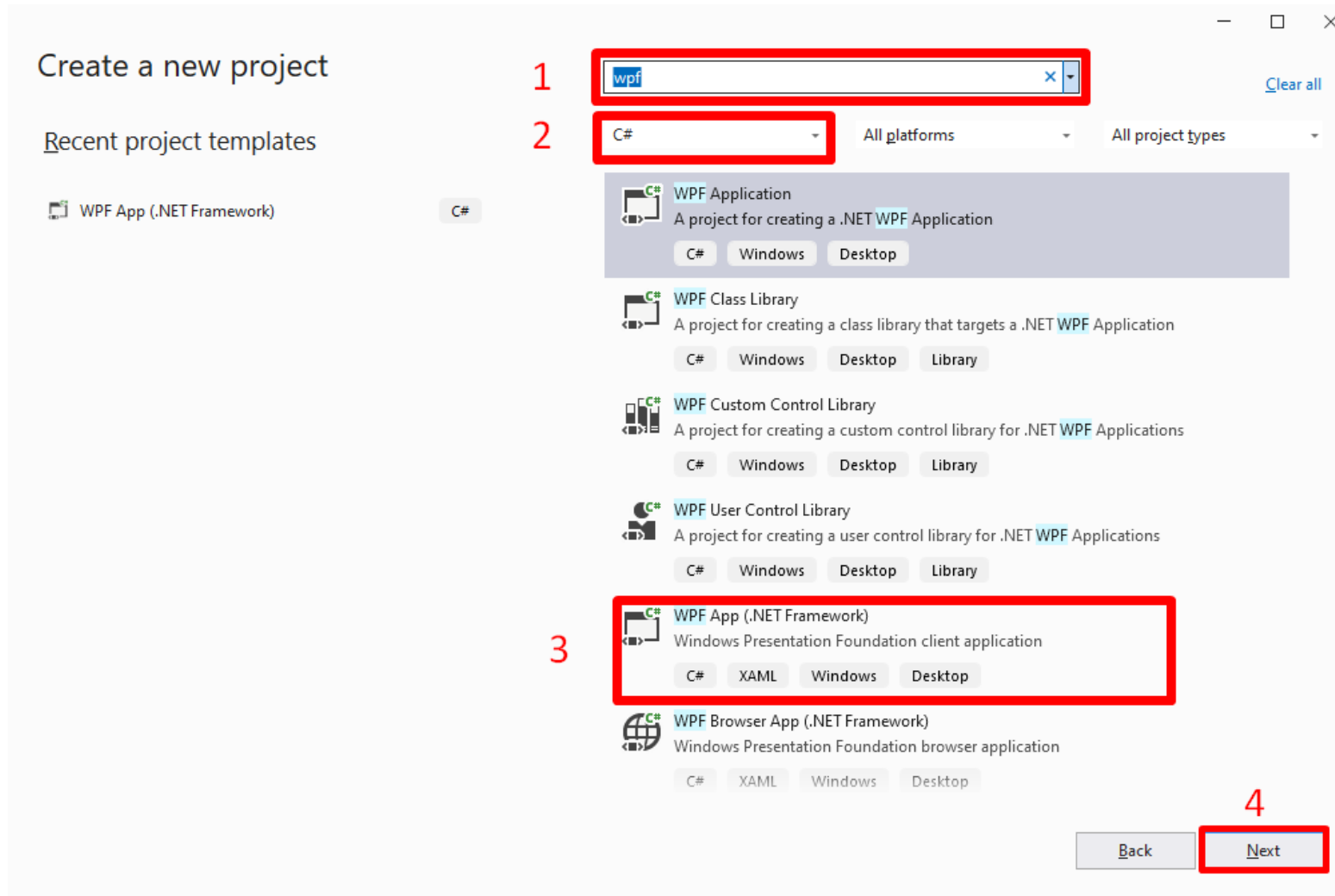
Overzicht semester

- 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

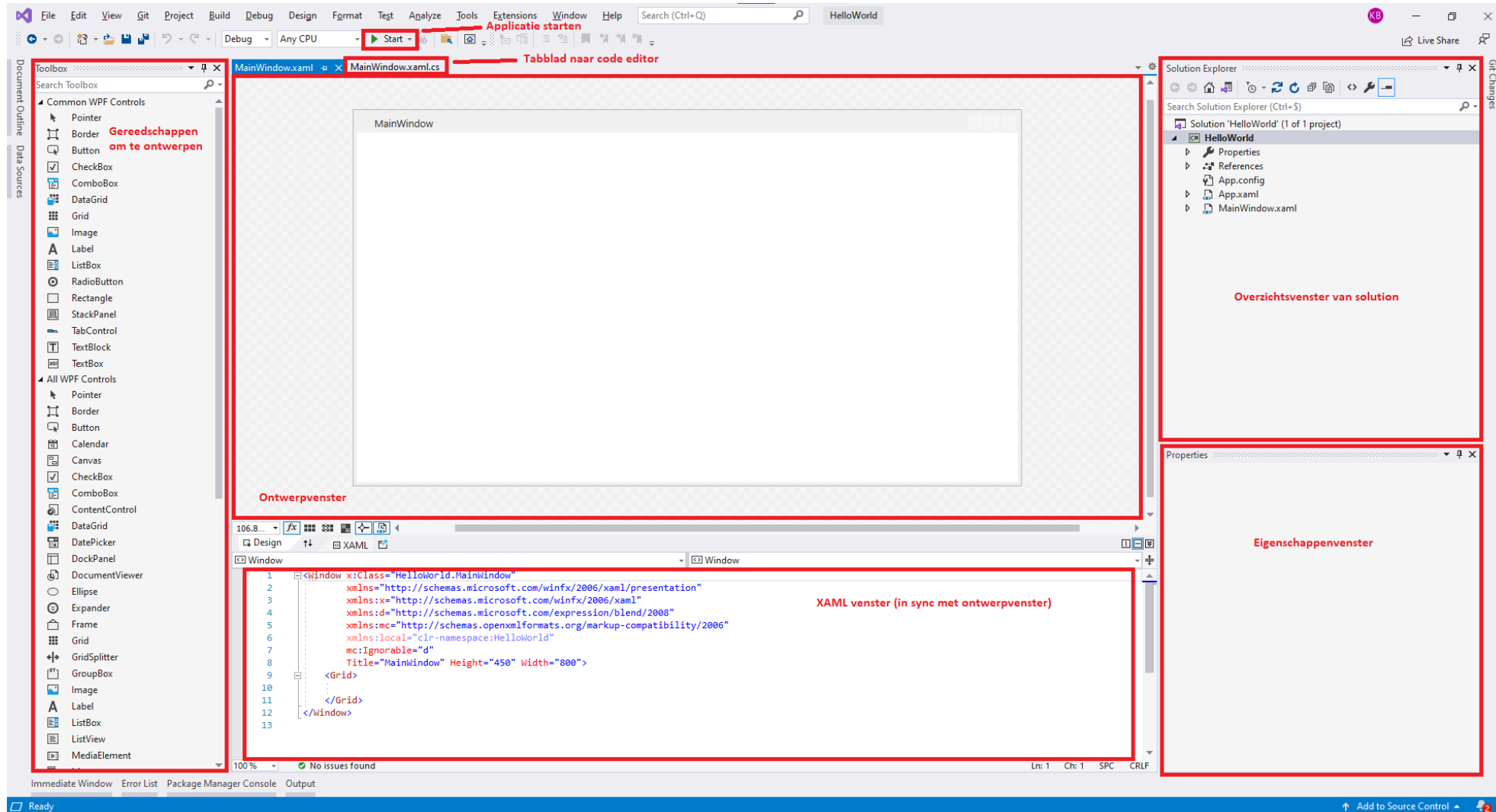
Solution name ⓘ
HelloWorld

☐ Place solution and project in the same directory

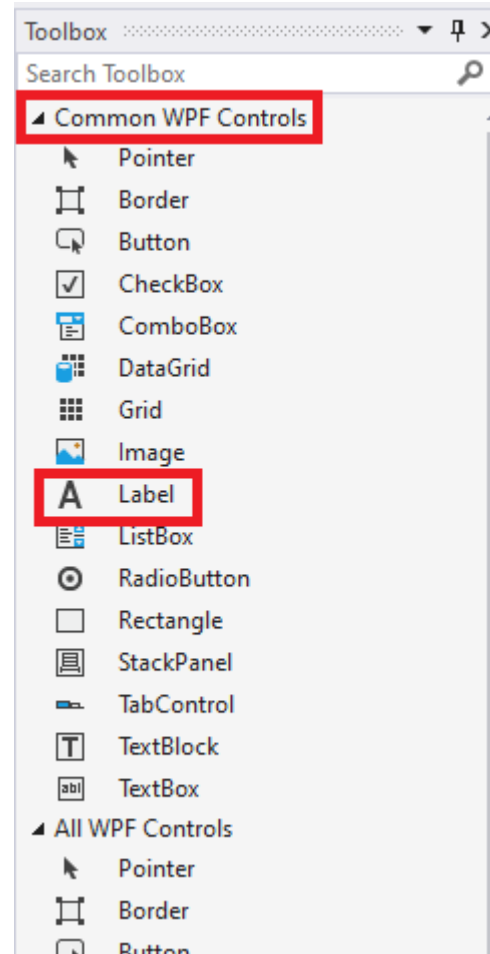
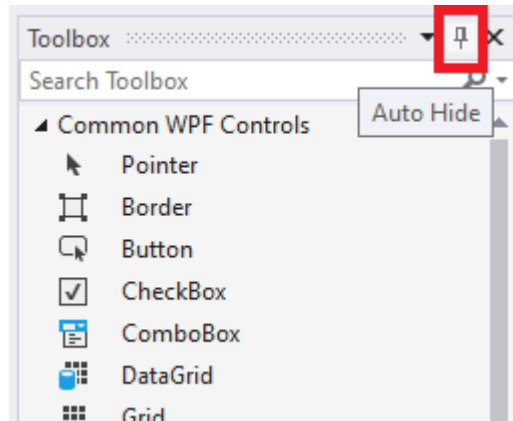
Framework
.NET Framework 4.7.2

Back Create

Visual Studio IDE



Visual Studio IDE



Visual Studio IDE



The screenshot displays the Visual Studio IDE interface for a WPF application. The design view shows a window with a grid layout. A **Label** control is positioned in the top-left corner, highlighted with a red rectangle. A dimension line indicates a horizontal margin of 178. The code view shows the XAML for the **Label** control, with the **<Label>** element highlighted by a red rectangle. The Properties window is open on the right, showing the **Label** control's properties, with the **Common** section expanded and the **Content** property set to **Label**.

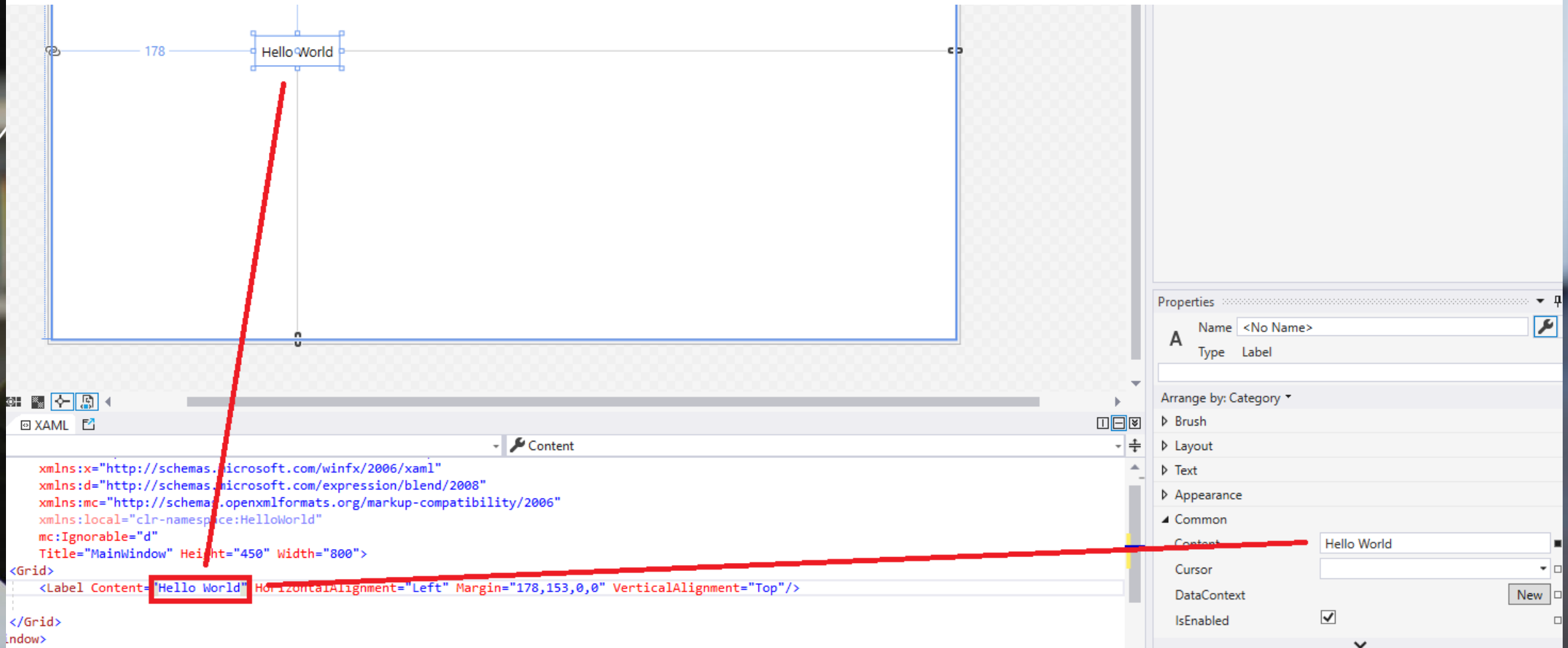
Design View: A window titled "MainWindow" with a grid layout. A **Label** control is positioned in the top-left corner, highlighted with a red rectangle. A dimension line indicates a horizontal margin of 178.

Code View: The XAML code for the **Label** control is shown, with the **<Label>** element highlighted by a red rectangle.

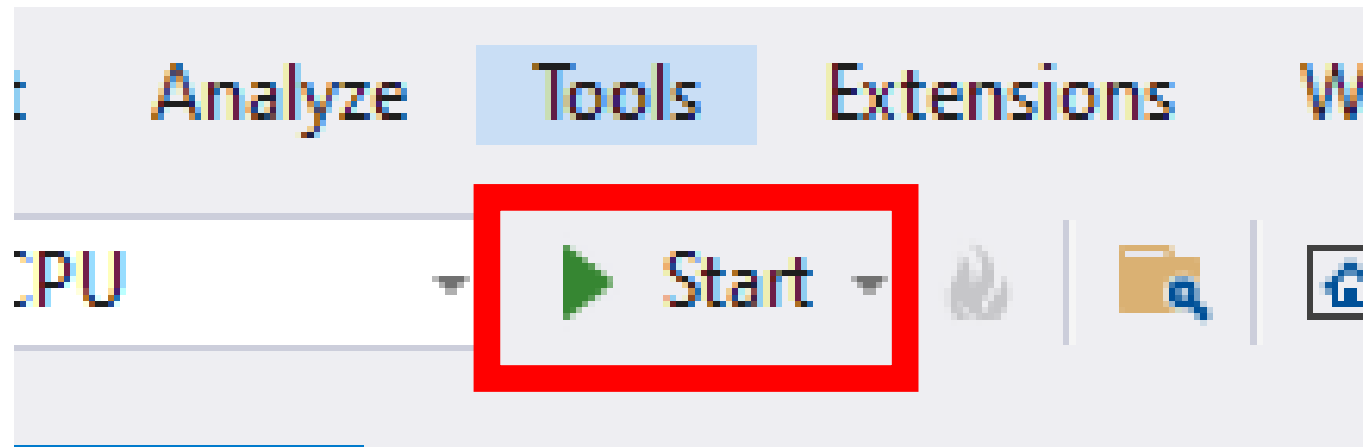
```
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
xmlns:local="clr-namespace:HelloWorld"
mc:Ignorable="d"
Title="MainWindow" Height="450" Width="800">
<Grid>
  <Label Content="Label" HorizontalAlignment="Left" Margin="178,153,0,0" VerticalAlignment="Top"/>
</Grid>
</Window>
```

Properties Window: The **Label** control's properties are shown, with the **Common** section expanded and the **Content** property set to **Label**.

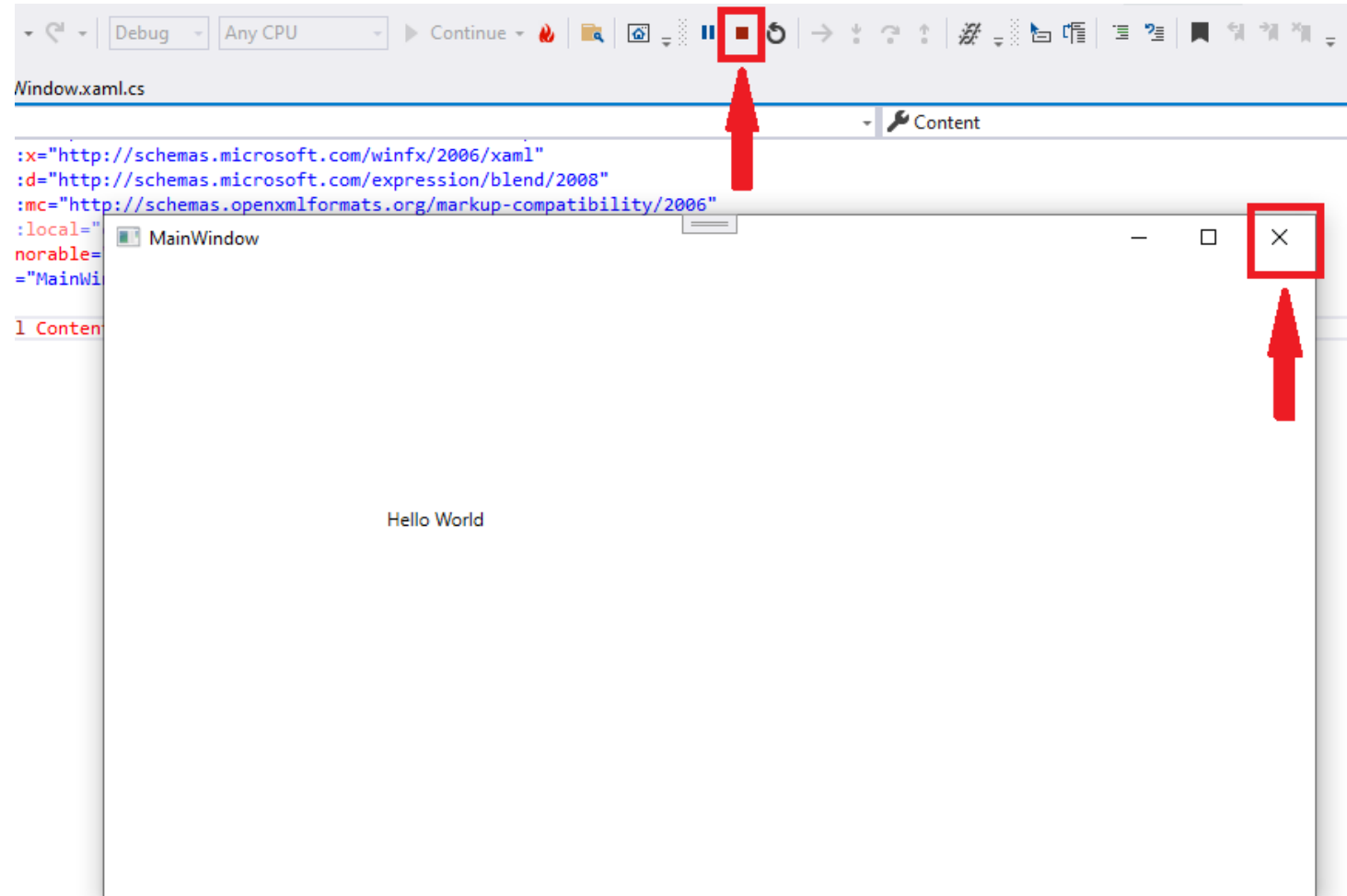
Visual Studio IDE



Visual Studio IDE



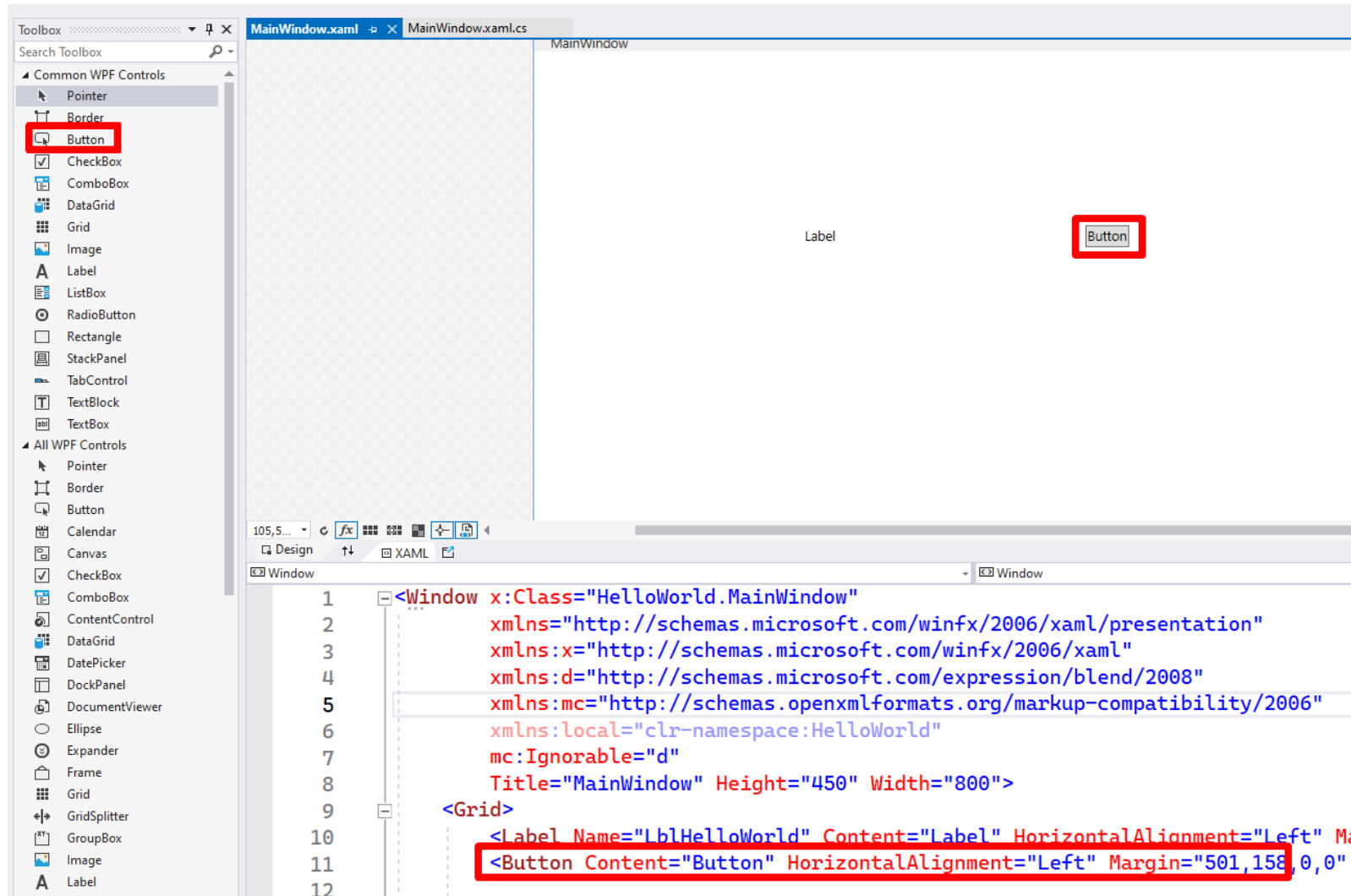
Visual Studio IDE



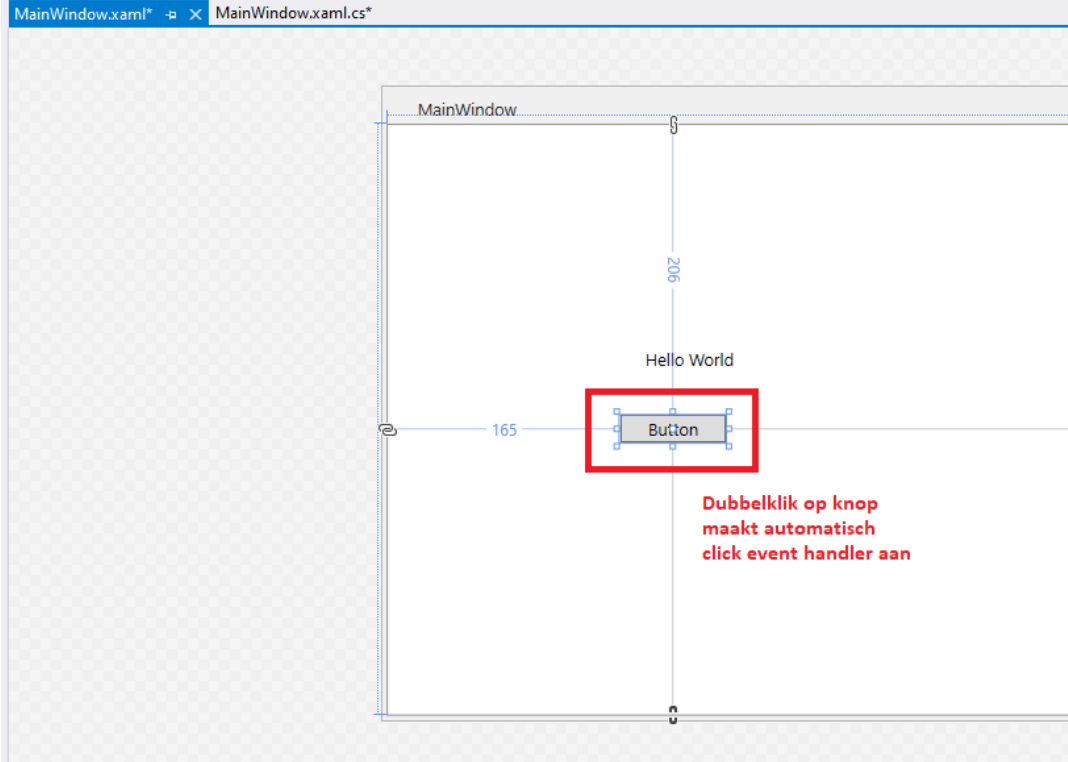
Hello World

```
<Grid>  
  <Label Name="LblHelloWorld" Content="Label" HorizontalAlignment="Left" Margin="241,
```

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         0 references
30         private void Button_Click(object sender, RoutedEventArgs e)
31         {
32         }
33     }
34 }
```

Hello World

```
28 private void Button_Click(object sender, RoutedEventArgs e)
29 {
30     lbl
31 }
32 }
33 }
```

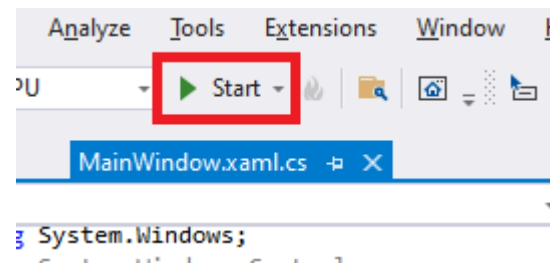
Reference

lbl

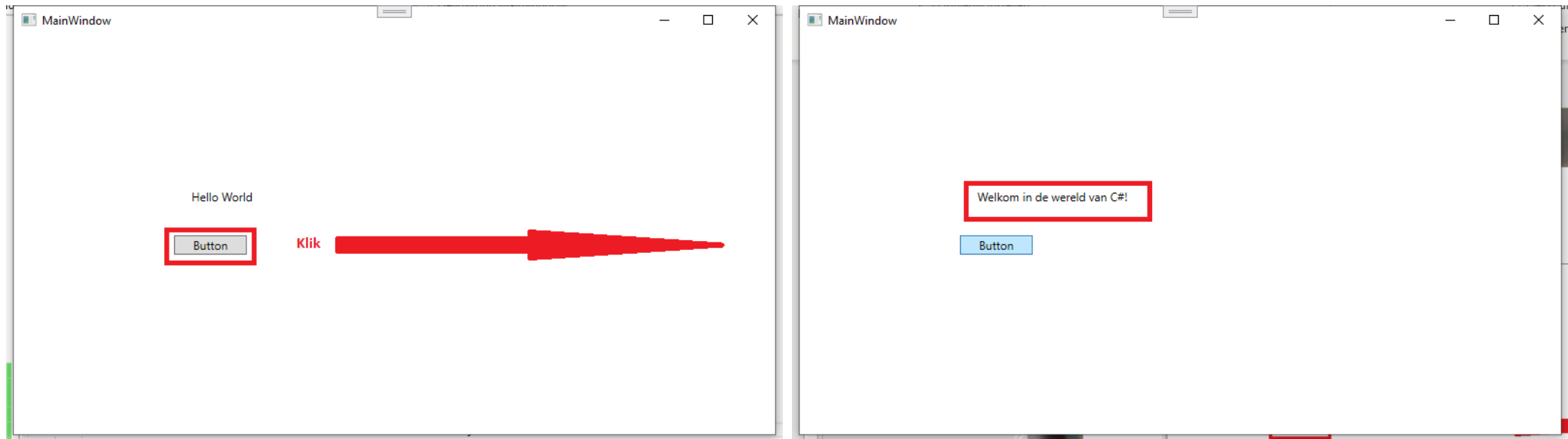
LblHelloWorld (field) Label MainWindow.LblHelloWorld

```
28 private void Button_Click(object sender, RoutedEventArgs e)
29 {
30     LblHelloWorld.Content = "Welkom in de wereld van C#!";
31 }
```

Reference

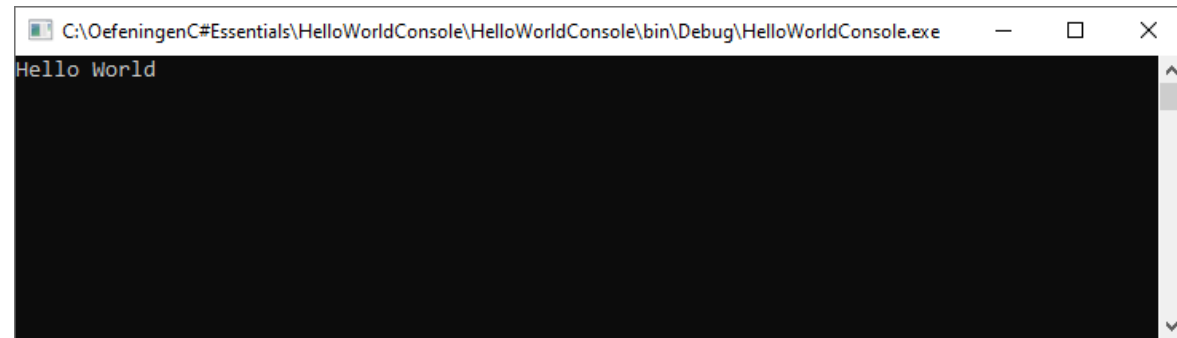


Hello World

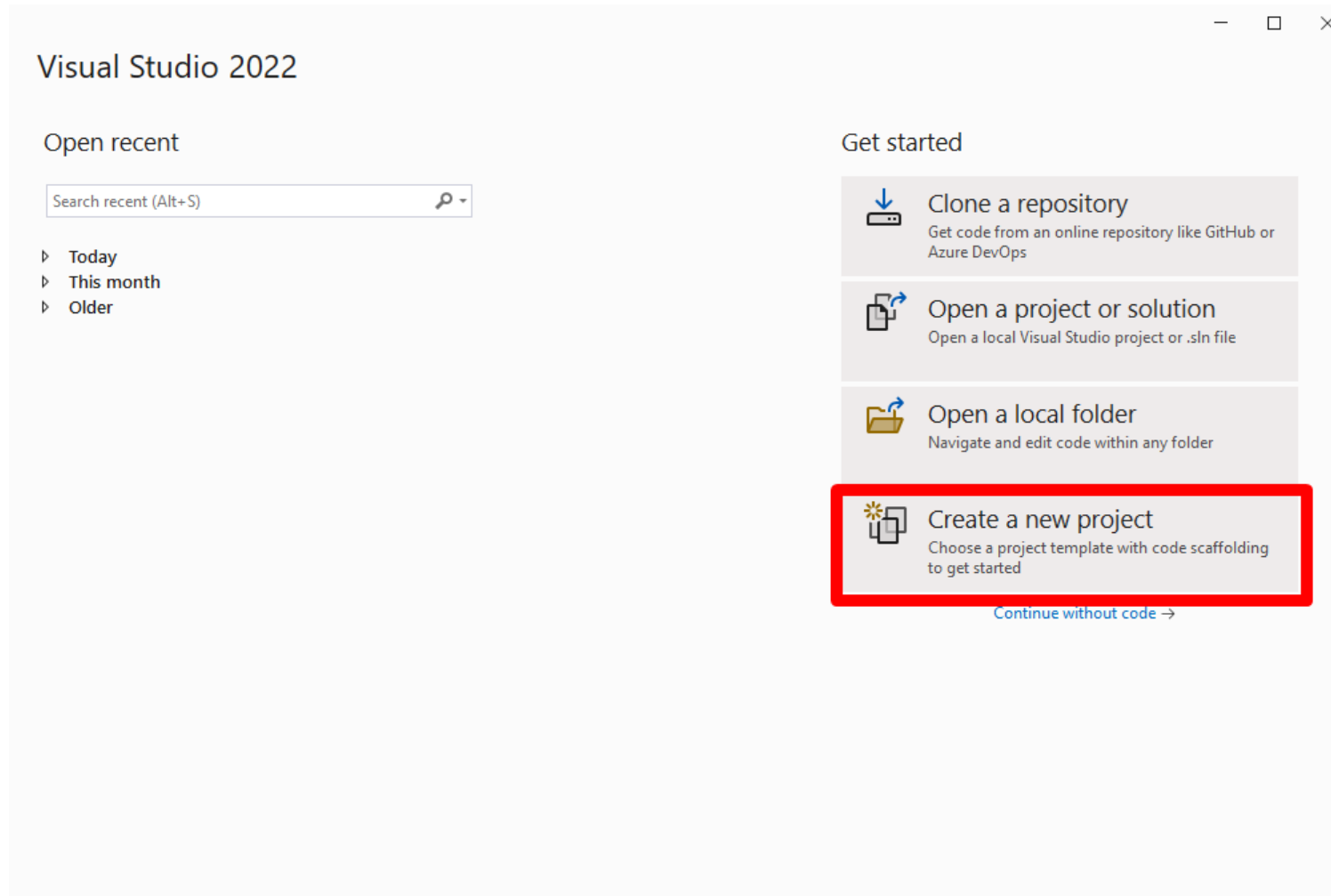


Console applicatie

- 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

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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

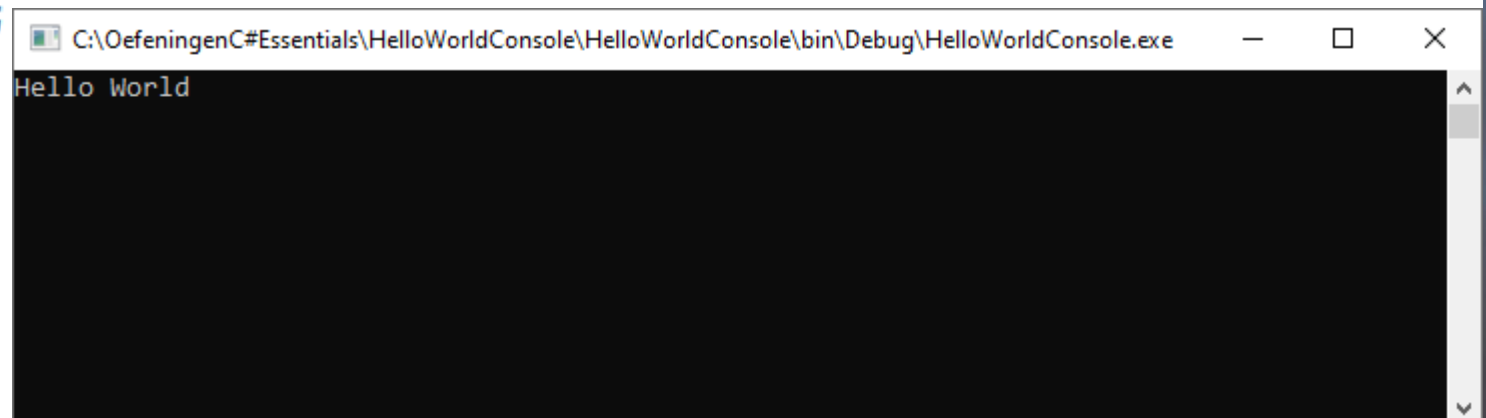
- Main is het startpunt van een console applicatie

```
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*)

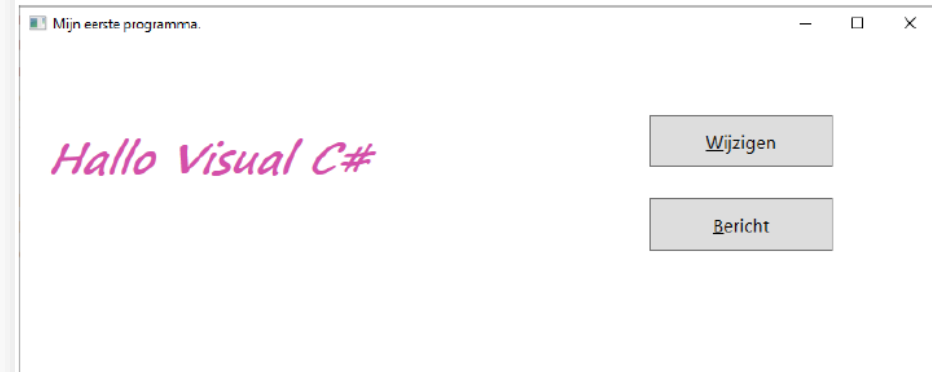
Einde

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