

CS202: Software Tools and Techniques for CSE

Lecture 9

Shouvick Mondal

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August 2025



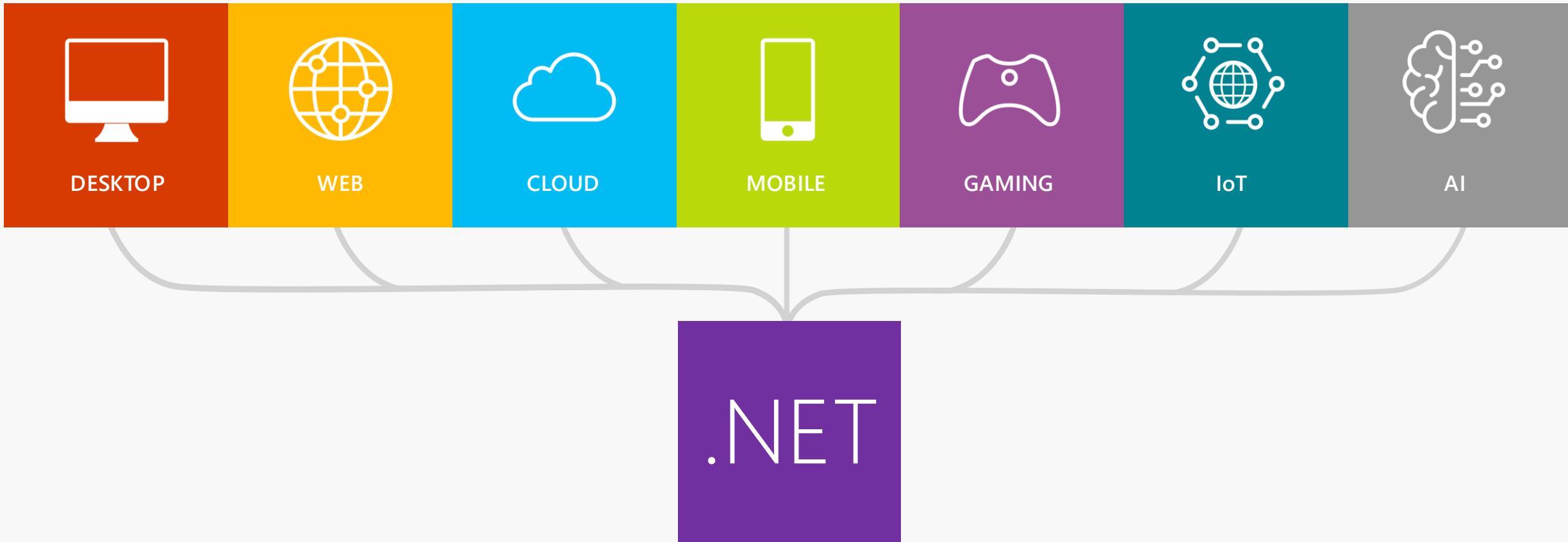
*Free. Cross-platform. Open source.
A developer platform for building all your apps.*

www.dot.net

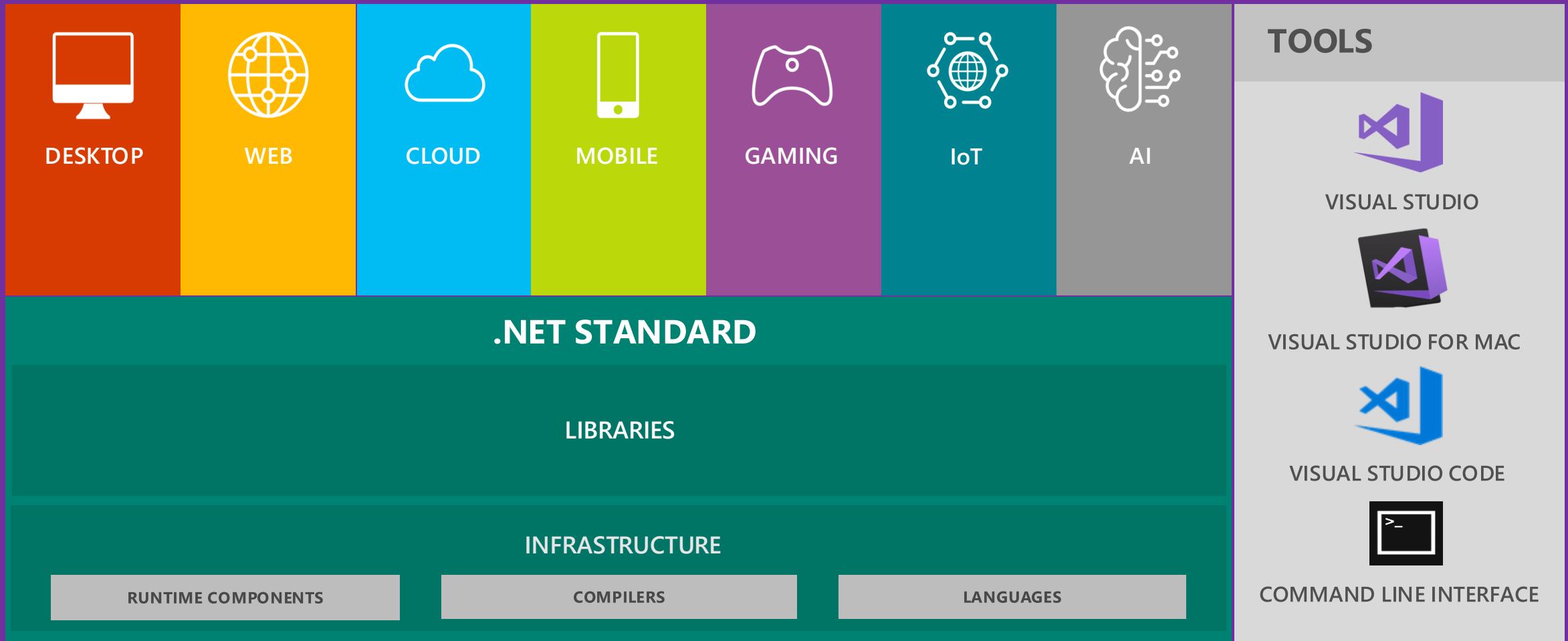
What is .NET?



Your platform for building **anything**



.NET is a software development platform



You can write code with many .NET languages

C# (c-sharp)

- C# is a simple, modern, object-oriented, and type-safe programming language
- Its roots in the C family of languages makes C# immediately familiar to C, C++, Java, and JavaScript programmers

```
var names = new List<String>
{
    "Ana",
    "Felipe",
    "Emillia"
};

foreach (var name in names)
{
    Console.WriteLine($"Hello {name}");
}
```

F# (f-sharp)

- F# is a cross-platform, open-source, functional programming language for .NET
- It also includes object-oriented and imperative programming

```
let numbers = [ 1; 2; 3; 4; 5; 6; 7; 8; 9; 10 ]

let square x = x * x
let isOdd x = x % 2 <> 0

let squaresOfOdds =
    numbers
    |> List.filter isOdd
    |> List.map square

printfn "%A" squaresOfOdds
```

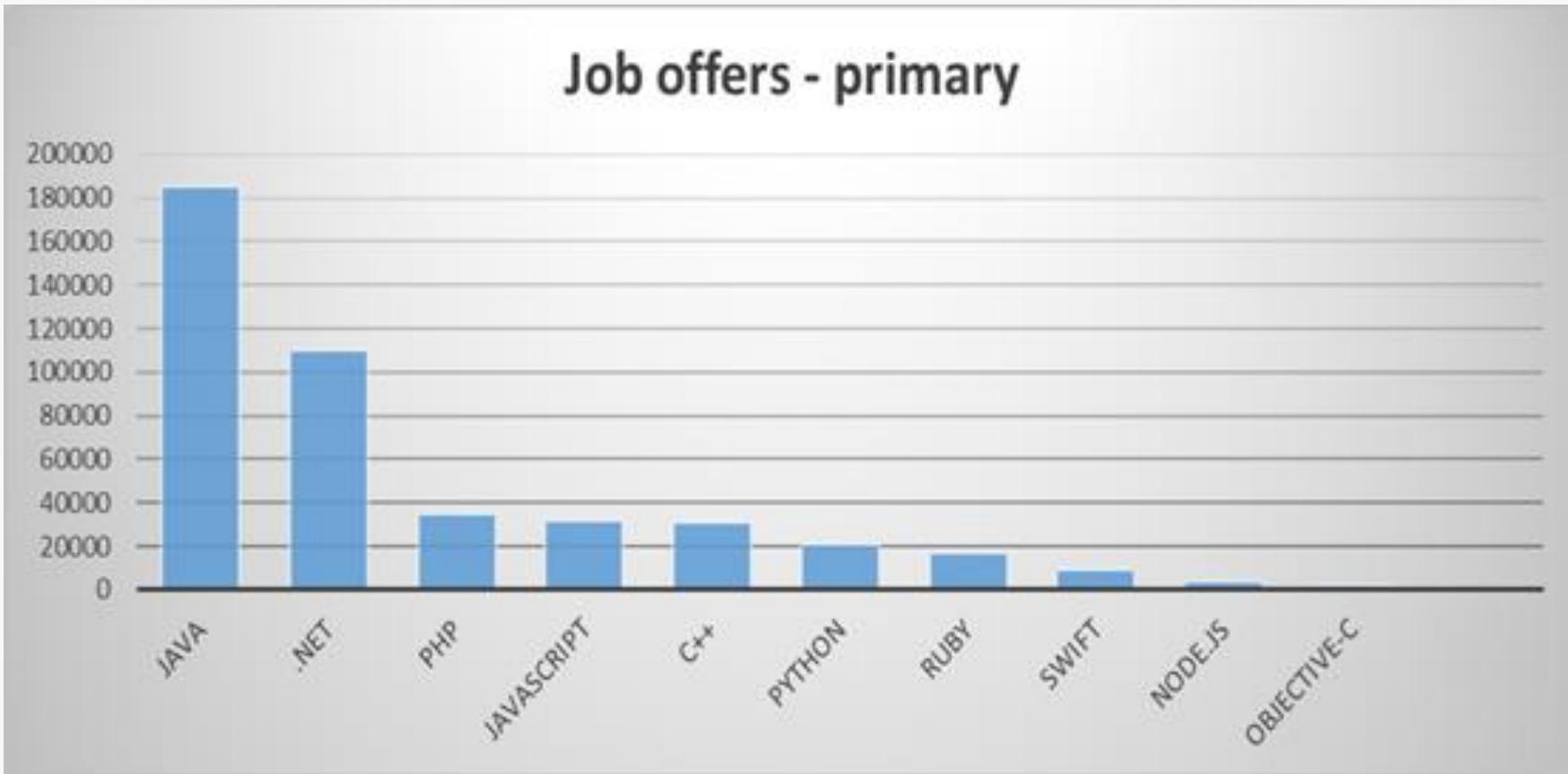
Visual Basic

- Visual Basic is an approachable language with a simple syntax for building type-safe, object-oriented apps

```
Dim names As New List(Of String)({
    "Ana",
    "Felipe",
    "Emillia"
})

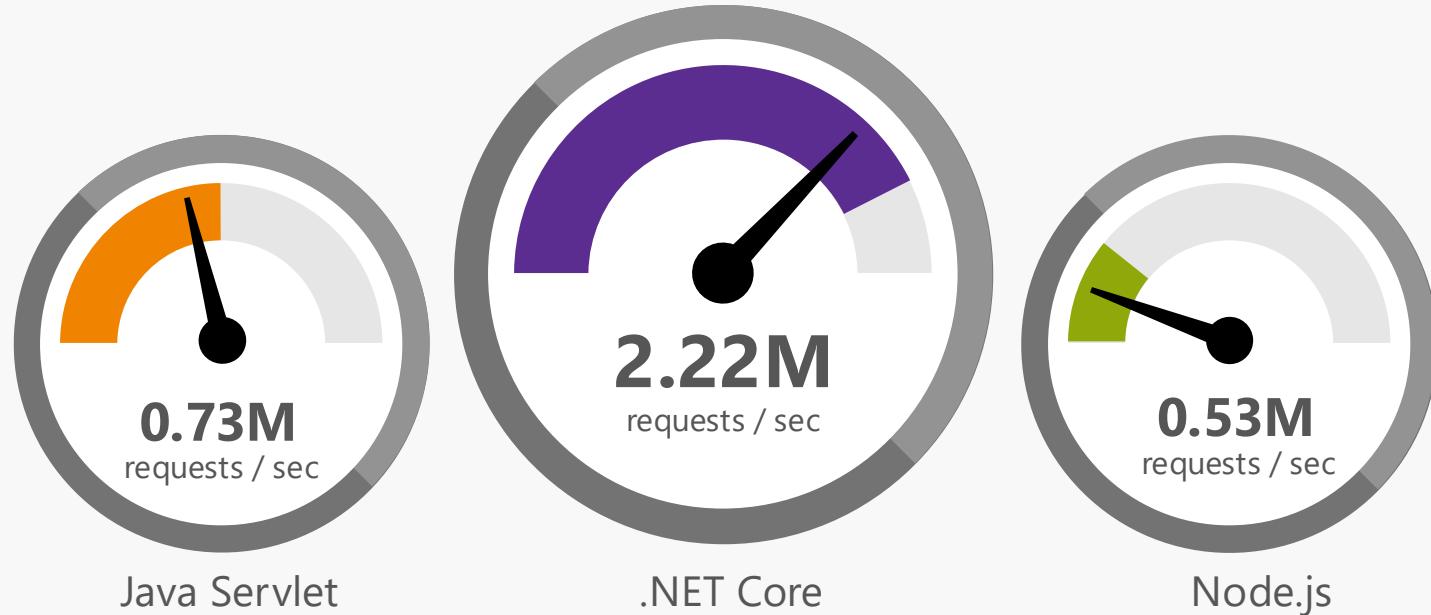
For Each name In names
    Console.WriteLine($"Hello {name}")
Next
```

.NET is a sought after job skill



#2 demanded primary technology
(LinkedIn)

.NET is Fast. Really Fast!



Data sourced from official tests available at [TechEmpower Round 15](#).

“Using the same-size server, we were able to go from 1,000 requests per second per node with Node.js to 20,000 requests per second with .NET Core.”
— Raygun

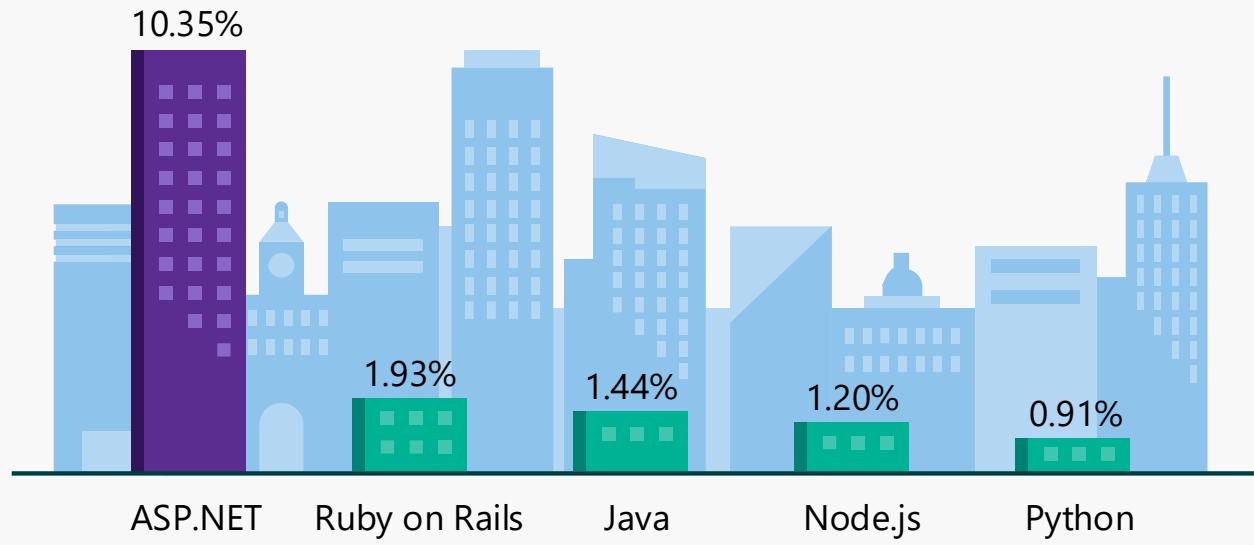
<https://www.microsoft.com/net/customers>

Source: <https://github.com/dotnet-presentations/home/tree/master/.NET%20Intro>

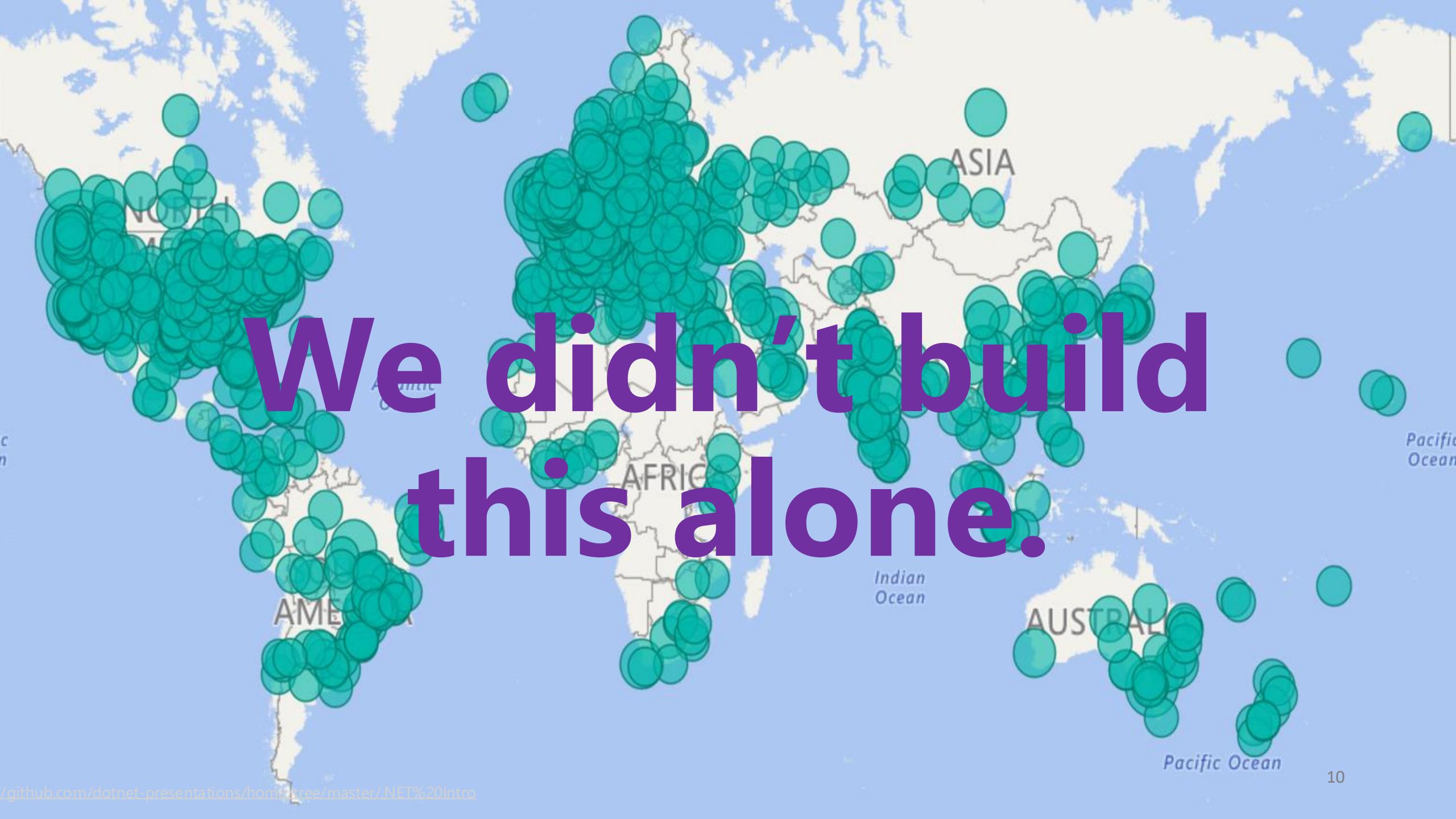
.NET is the platform of choice for the top 100K websites

More websites have been developed with ASP.NET than Ruby, Java, Python, Node.js, and Go combined.

Companies like [Raygun](#), [GoDaddy](#), and [Tencent](#) choose .NET for better performance, increased flexibility, and higher compatibility.



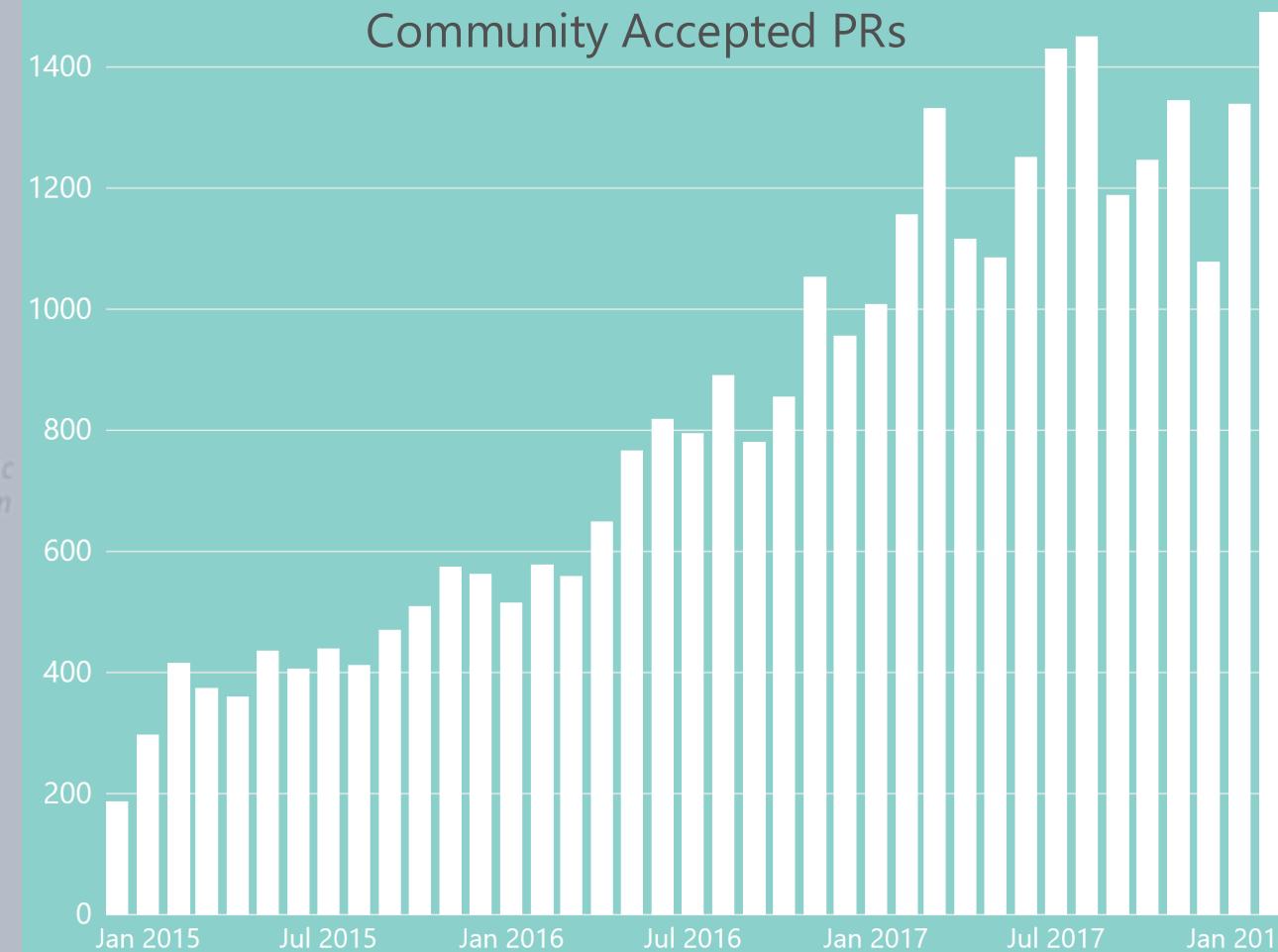
Data sourced from [SimilarTech](#)

A world map with teal bubbles representing .NET developer communities. The bubbles are concentrated in North America, Europe, and Asia, with smaller clusters in South America, Australia, and Africa. The map also shows major oceans and continents.

We didn't build
this alone.

.NET is Open Source

Community Accepted PRs

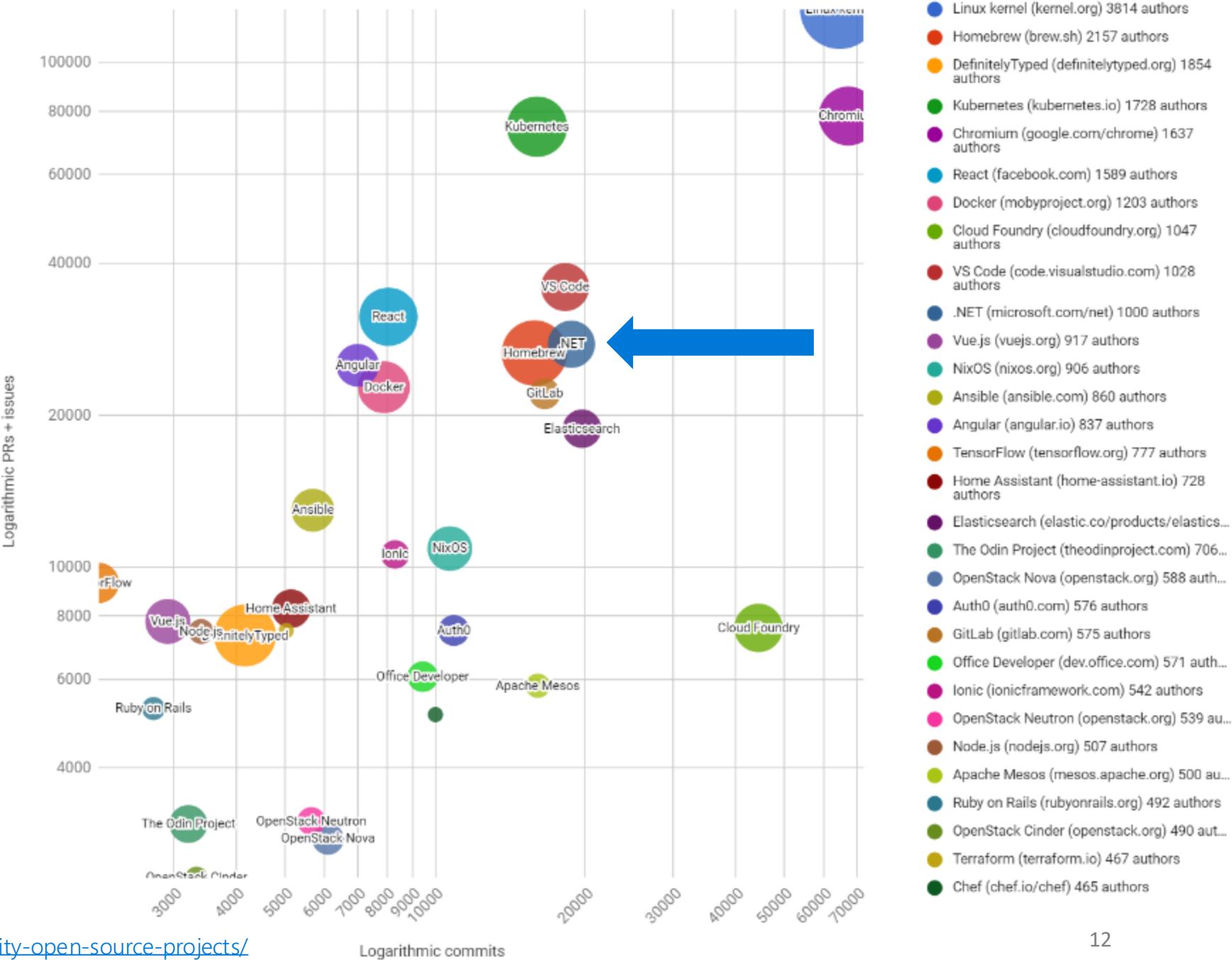


"Samsung is embracing .NET because it is a completely open source project." — Samsung

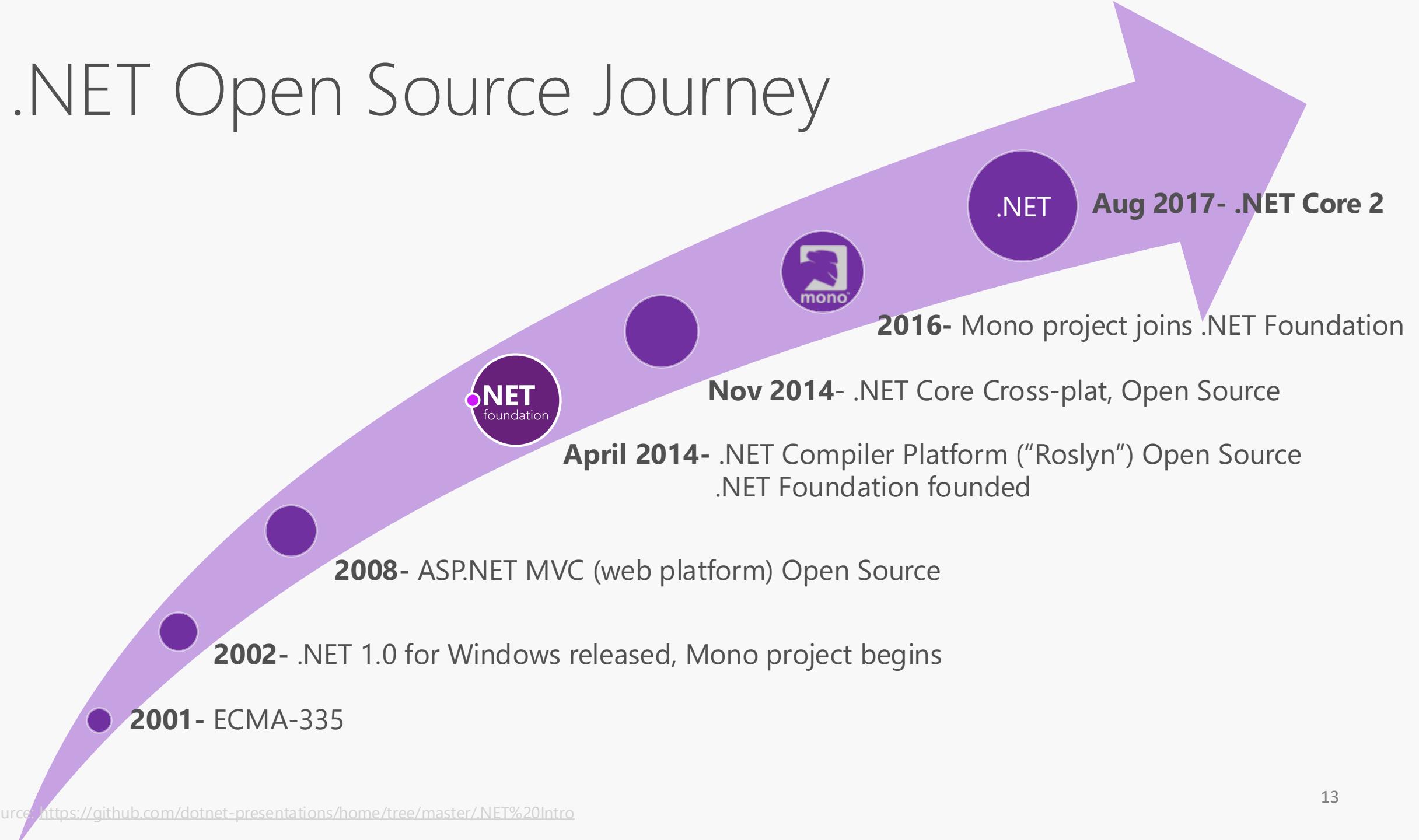
".NET is open source; that allows us to contribute back to it if we have any performance issues which Microsoft review and together we make a better product." — Illyriad Games

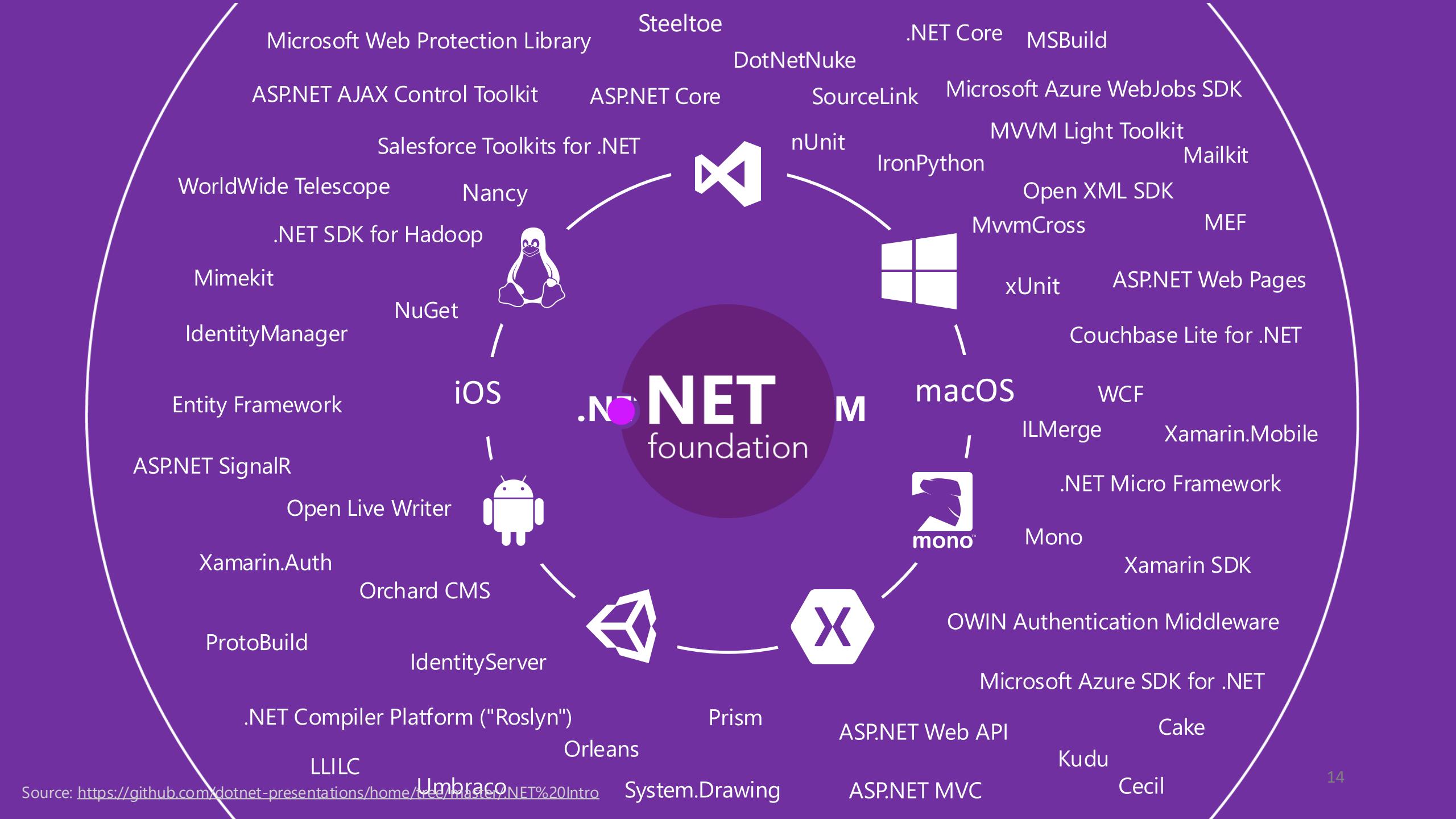
16,000+ Community Contributions from 3000+ Companies outside Microsoft

.NET named Top 30 Highest Velocity OSS Projects



.NET Open Source Journey





Meetups

- These User Groups have presentations on all sorts of .NET topics
- 135 groups and counting worldwide, just on meetup.com
- A lot of UGs aren't on meetup.com

The screenshot shows a Microsoft Edge browser window displaying the .NET Foundation Meetup page on <https://meetup.com/pro/dotnet>. The page features a world map with red pins indicating the locations of .NET user groups. Below the map, the .NET Foundation logo is displayed, along with statistics: 81,626 Members, 135 Groups, and 31 Countries. A search bar allows users to find specific meetups by location. The 'Meetups' section highlights the 'Build 2018 Public Viewing with BBQ & Friends' event.

.NET Foundation

Members: 81,626 | Groups: 135 | Countries: 31

Find .NET Foundation Meetups

Search for Places, Cities and Countries

Meetups

Build 2018 Public Viewing with BBQ & Friends

Who we are

The .NET Foundation is an independent organization to foster open development and collaboration around the .NET ecosystem. It serves as a forum for community and commercial developers alike to broaden and strengthen the future of the .NET ecosystem by promoting openness and community participation to encourage



TECHNICAL STEERING GROUP MEMBERS



SAMSUNG



These companies are helping to drive the future of .NET



RayGun

"Using the same-size server, we were able to go from 1,000 requests per second per node with Node.js to 20,000 requests per second with .NET Core."

- John-Daniel Trask, CEO and Co-Founder

Jet.com Inc.

"The event-driven, microservices paradigm eliminated a lot of the overhead that comes with a service-oriented architecture."

- Mike Hanrahan, CTO

Age of Ascent, Illyriad Games

"Our game microservices are built using ASP.NET Core which gives us superior performance. ASP.NET is open source, that allows us to contribute back to it if we have any performance issues which Microsoft review and together we make a better product."

- Ben Adams, CTO and Co-founder

United Parcel Service (UPS)

"Xamarin allowed us to develop a single code base in C# and deploy the application to two completely different mobile phone ecosystems."

- Scott Hildebrand, Application Development Manager

AstroReality, Quantum Technologies

"We think .NET Core is mature, very powerful, and a great choice for advanced modern apps."

- Zerlot Ma, Cofounder and CEO

Tencent

"The cross-platform capabilities of .NET Core were very important to us. Also, Microsoft designed .NET Core with a microservice architecture in mind, and that fits right in with our redesign plans."

- Shanyou Zhang: Senior Software Architect

NetEase

".NET Core doesn't just help us get to market faster, it also enables our developers to focus on the core logic and what really matters, our players' experience. They don't have to deal with the communication gap and different ways of implementing the algorithm on the back and front end. They can just work on finding better ways to implement their ideas."

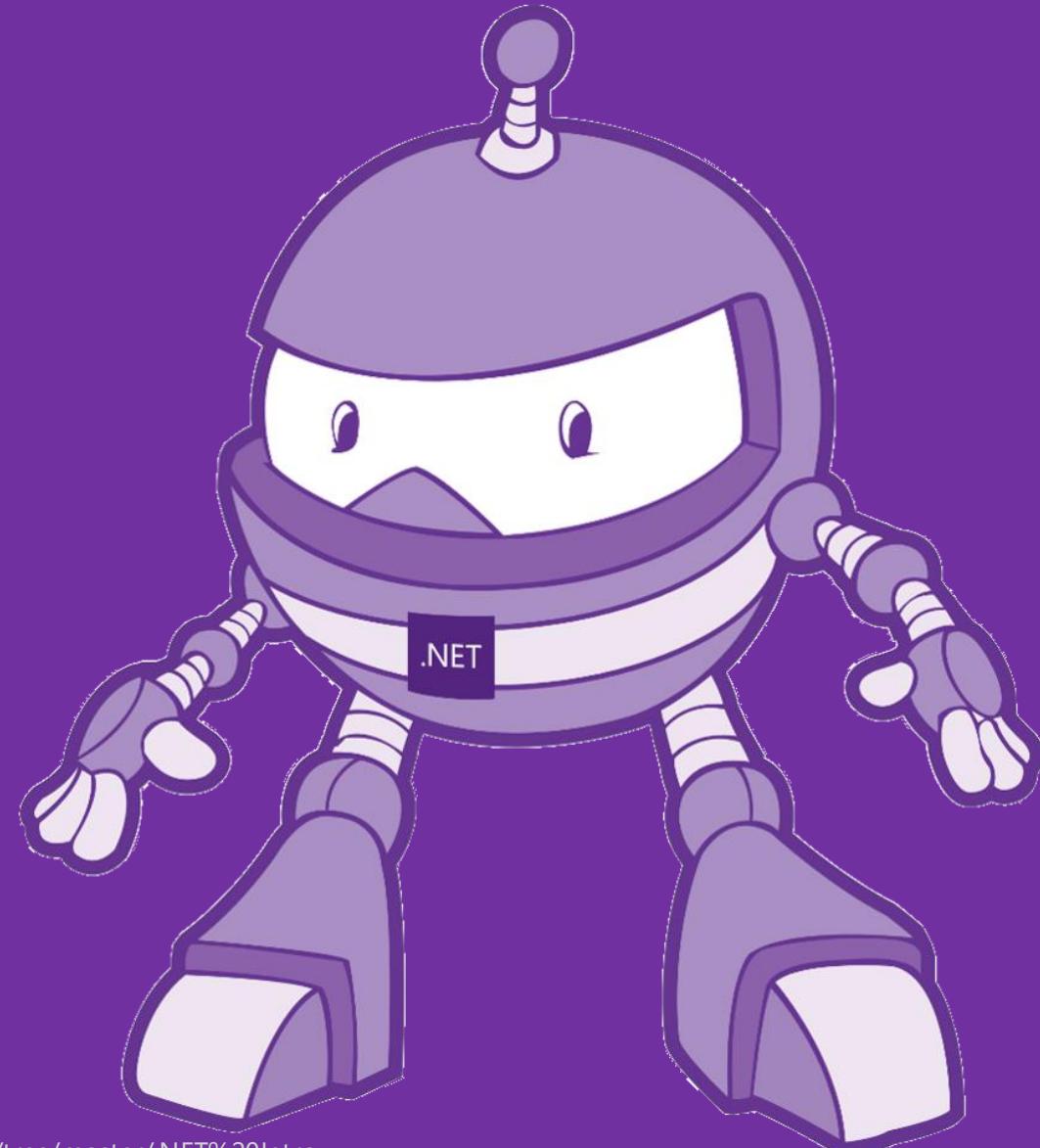
- Feng Zhou, Product Director

GoDaddy

"Services can be developed more quickly, perform faster in production, and scale better if they're written using .NET Core with C#."

- Jeremiah Gowdy: Principal Software Architect

This is our mascot, dotnet-bot



You can find dotnet-bot on GitHub

The screenshot shows the GitHub profile page for the user 'dotnet-bot'. The profile features a large, stylized purple robot icon. The user's name is listed as 'dotnet bot' and their GitHub handle as 'dotnet-bot'. Below the name is a 'Follow' button and a link to 'Block or report user'. To the right of the profile picture, there are links to '.NET Foundation', 'Cyberspace', an email address ('dotnet-bot@dotnetfoundation.org'), and a blog URL ('http://blogs.msdn.com/b/dotnet/'). The 'Overview' tab is selected, showing metrics: Repositories (9), Stars (2), Followers (141), and Following (0). Below the metrics, a section titled 'Popular repositories' lists six repositories, each with a thumbnail, name, fork origin, description, and language. The repositories are: 'corefx' (Forked from dotnet/corefx), 'coreclr' (Forked from dotnet/coreclr), 'wcf' (Forked from dotnet/wcf), 'corert' (Forked from dotnet/corert), 'cli' (Forked from dotnet/cli), and 'core-setup' (Forked from dotnet/core-setup). Each repository entry includes a language indicator (C# for most, C++ for core-setup) and a brief description. At the bottom of the page, a chart titled '6,053 contributions in the last year' shows a heatmap of activity by day of the week (Mon-Fri) and month (Mar-Feb). A legend at the bottom right indicates contribution levels: 'Less' (light green), 'More' (dark green).

GitHub is where open source happens...

The screenshot shows the GitHub interface for the `dotnet/corefx` repository. The top navigation bar includes links for Pull requests, Issues, Marketplace, and Explore. On the right, there's a sidebar for the `.NET Foundation` organization.

The main repository page displays the following metrics: Overview (Repositories 11, Stars 16, Followers 48, Following 0), Watch (1,556), Unstar (13,525), Fork (3,854). Below these are tabs for Code, Issues (2,197), Pull requests (51), Projects (0), Wiki, and Insights. A green box highlights the Pull requests tab.

Below the tabs are filters (Filters dropdown, search for `is:pr is:open`, Labels, Milestones), a New pull request button, and a summary of pull request status: 51 Open (highlighted by a green box) and 16,273 Closed. A green box also highlights the '51 Open' count.

The pull request list shows three items:

- #28037: Add GetHashCode test for invariant mode. Status: * NO MERGE *. Labels: area-System.Globalization. Author: tarekgh. Opened 32 minutes ago.
- #28036: [*No Merge*] Enable failing authentication test cases on different httpclienthandlers. Status: * NO MERGE *. Labels: area-System.Net.Http. Author: caesar1995. Opened an hour ago.
- #28034: Add Xamarin placeholders for System.Memory package. Status: Pending. Labels: None. Author: weshaggard. Opened an hour ago.

A timeline at the bottom shows contributions from Wednesday to Friday. A green box highlights the '51 Open' status in the pull request list.

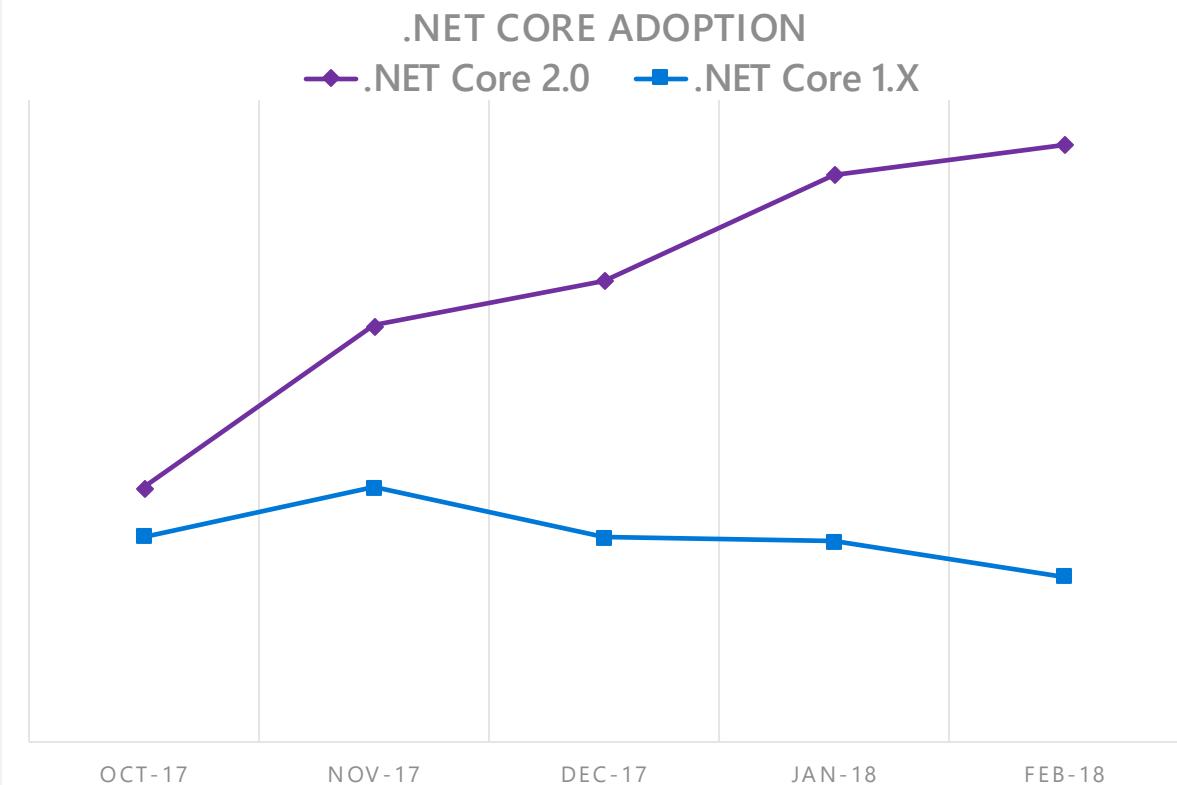
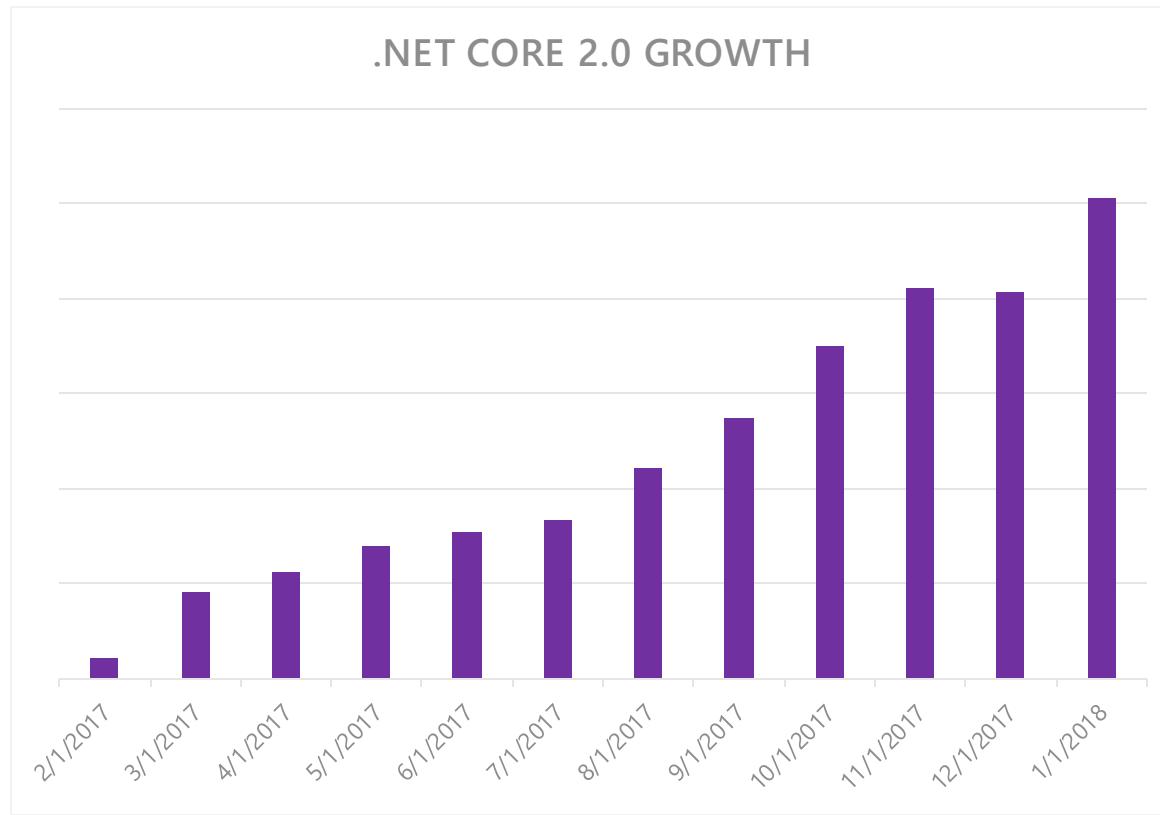
On the right side, there's a sidebar for the `.NET Foundation` organization, showing metrics: Microsoft (.NET Foundation), GitHub stats (13,525 stars, 3,854 forks, updated 9 minutes ago), and a versions section.

Page number 20 is visible in the bottom right corner.

Source: <https://github.com/dotnet-presentations/home/tree/master/.NET%20Intro>

.NET Core Growth

Over Half Million Active*.NET Core 2.0 Developers!

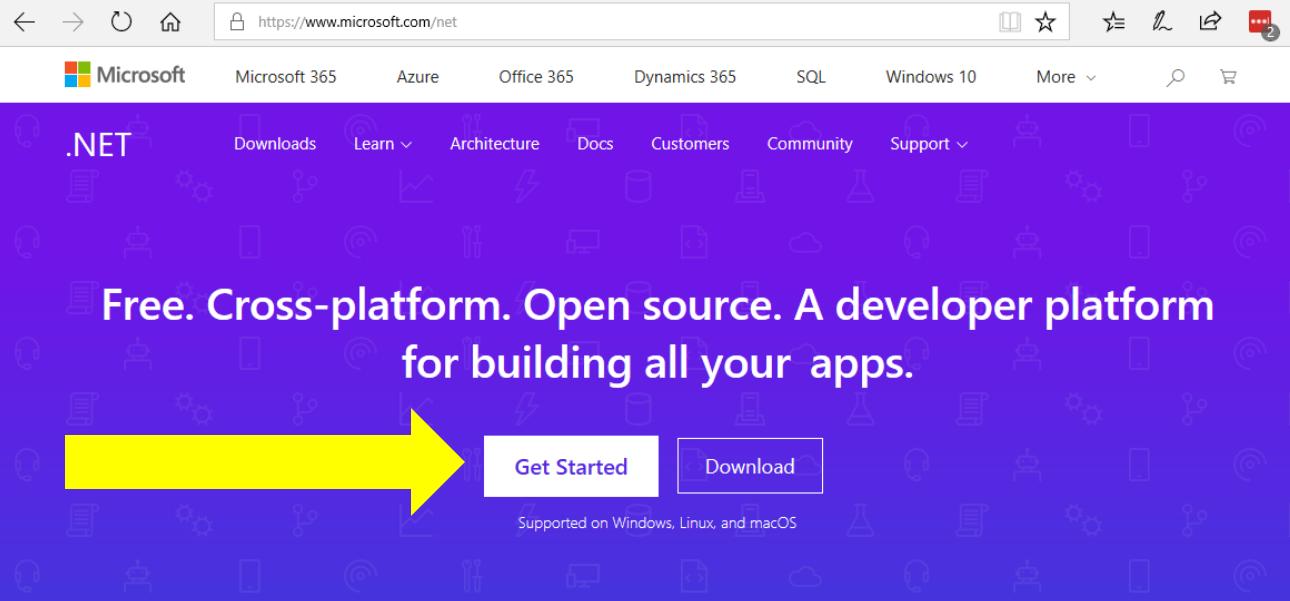


* Active = unique monthly developers with 2+ days of development per month.

Learn how to program with C#

www.dot.net

In-Browser Tutorial



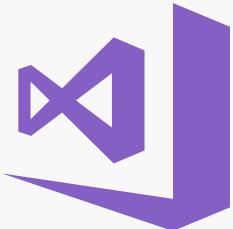
A screenshot of the Microsoft .NET website. A large yellow arrow points from the left towards the 'Get Started' button. The page features a purple background with various icons related to software development. The 'Get Started' button is highlighted with a yellow arrow. Below the button, text reads 'Supported on Windows, Linux, and macOS'. To the right, there is an 'In-Browser Tutorial' section where a snippet of C# code is being typed into a text area. The code is as follows:

```
1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4
5 namespace myApp
6 {
7     class Program
8     {
9         static void Main()
10        {
11            Console.WriteLine("Hello Beth!");
12            Cons
13        }
14    }
15 }
```

The code editor has a light blue scroll bar on the right. Below the code, there are two buttons: 'Run Code' and 'Next Step'. A green message bar says 'Hey Beth! Let's keep coding.' At the bottom, a black box shows the output 'CONSOLE Hello Beth!'. On the left side of the main content area, there are six categories: Web, Mobile, Desktop, Gaming, Machine Learning & AI, and Internet of Things, each with a small icon and a brief description.

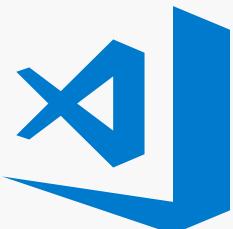
Make it easier with some free tools

www.VisualStudio.com



Visual Studio

A fully-featured, integrated development environment (IDE) for developing .NET apps on a Windows PC development machine.



Visual Studio Code

Open source, cross-platform editor with .NET support.



Visual Studio for Mac

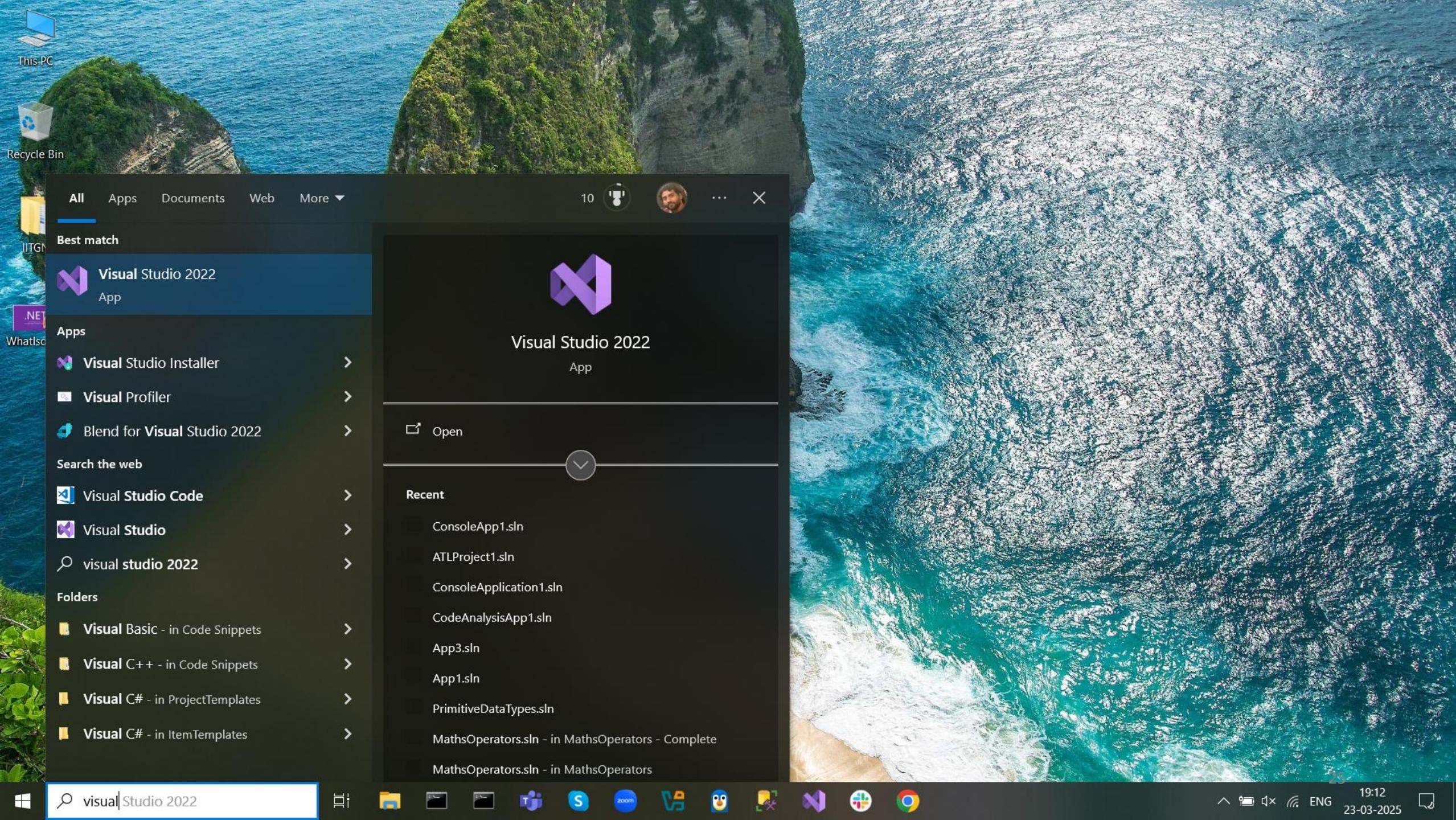
A fully-featured IDE for developing .NET apps on a Mac OS development machine.

Download from www.VisualStudio.com

Demo

Get started with .NET on your computer







This PC



Recycle Bin



IITGN



.NET Core

What's new...

Visual Studio 2022

Open recent

As you use Visual Studio, any projects, folders, or files that you open will show up here for quick access.

You can pin anything that you open frequently so that it's always at the top of the list.

Get started



Clone a repository

Get code from an online repository like GitHub or Azure DevOps



Open a project or solution

Open a local Visual Studio project or .sln file



Open a local folder

Navigate and edit code within any folder



Create a new project

Choose a project template with code scaffolding to get started

[Continue without code →](#)



Type here to search



Create a new project

Search

All languages ▾ All platforms ▾ All project types ▾

 **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

 **Blazor Web App**
A project template for creating a Blazor web app that supports both server-side rendering and client interactivity. This template can be used for web apps with rich dynamic user interfaces (UIs).
C# Linux macOS Windows Blazor Cloud Web

 **.NET Aspire Starter App**
A project template for creating a .NET Aspire app with a Blazor web frontend and web API backend service, optionally using Redis for caching.
C# .NET Aspire API Blazor Cloud Common Service Web Web API

 **ASP.NET Core Web App (Razor Pages)**
A project template for creating an ASP.NET Core application with example ASP.NET Core Razor Pages content
C# Linux macOS Windows Cloud Service Web

 **ASP.NET Core Web API**
A project template for creating a RESTful Web API using ASP.NET Core controllers or minimal APIs, with optional support for OpenAPI and authentication.
C# Linux macOS Windows API Cloud Service Web Web API

 **ASP.NET Core Web API (native AOT)**
A project template for creating a RESTful Web API using ASP.NET Core minimal APIs published as native AOT.
C# Linux macOS Windows API Cloud Service Web Web API

 **Class Library**
A project for creating a class library that targets .NET or .NET Standard
C# Android Linux macOS Windows Library



Back Next



Type here to search



Create a new project

Search for templates (Alt+S) 

Recent project templates

A list of your recently accessed templates will be displayed here.

All languages  All platforms  All project types 

C# 
 C++
 F#
 JavaScript
 Python
 Query Language
 TypeScript
 Visual Basic
 XAML

a command-line application that can run on .NET on Windows, Linux and macOS
 cOS Windows Console

.NET Aspire Starter App 

A project template for creating a .NET Aspire app with a Blazor web frontend and web API backend service, optionally using Redis for caching.

C# .NET Aspire API Blazor Cloud Common Service Web Web API



ASP.NET Core Web App (Razor Pages)

A project template for creating an ASP.NET Core application with example ASP.NET Core Razor Pages content

C# Linux macOS Windows Cloud Service Web



ASP.NET Core Web API

A project template for creating a RESTful Web API using ASP.NET Core controllers or minimal APIs, with optional support for OpenAPI and authentication.

C# Linux macOS Windows API Cloud Service Web Web API



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Class Library

A project for creating a class library that targets .NET or .NET Standard

C# Android Linux macOS Windows Library



Azure Functions

Back

Next

Create a new project

Recent project templates

A list of your recently accessed templates will be displayed here.

C# All platforms All project types Clear all

 **Console App**
A project for creating a command-line application.
C# Linux macOS Windows Blazor Cloud Web

 **Blazor Web App**
A project template for creating dynamic user interfaces (UI) that supports both server-side rendering and client interactivity. This template can be used for web apps with rich

 **.NET Aspire Starter App**
A project template for creating a .NET Aspire app with a Blazor web frontend and web API backend service, optionally using Redis for caching.
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C# Android Linux macOS Windows Library

 **Azure Functions**

Back

Next

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Create a new project

Search for templates (Alt+S) 

[Clear all](#)

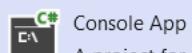
C#

Windows

All project types

Recent project templates

A list of your recently accessed templates will be displayed here.



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](#)



Blazor Web App

A project template for creating a Blazor web app that supports both server-side rendering and client interactivity. This template can be used for web apps with rich dynamic user interfaces (UIs).

[C#](#) [Linux](#) [macOS](#) [Windows](#) [Blazor](#) [Cloud](#) [Web](#)



ASP.NET Core Web App (Razor Pages)

A project template for creating an ASP.NET Core application with example ASP.NET Core Razor Pages content

[C#](#) [Linux](#) [macOS](#) [Windows](#) [Cloud](#) [Service](#) [Web](#)



ASP.NET Core Web API

A project template for creating a RESTful Web API using ASP.NET Core controllers or minimal APIs, with optional support for OpenAPI and authentication.

[C#](#) [Linux](#) [macOS](#) [Windows](#) [API](#) [Cloud](#) [Service](#) [Web](#) [Web API](#)



ASP.NET Core Web API (native AOT)

A project template for creating a RESTful Web API using ASP.NET Core minimal APIs published as native AOT.

[C#](#) [Linux](#) [macOS](#) [Windows](#) [API](#) [Cloud](#) [Service](#) [Web](#) [Web API](#)



Class Library

A project for creating a class library that targets .NET or .NET Standard

[C#](#) [Android](#) [Linux](#) [macOS](#) [Windows](#) [Library](#)



ASP.NET Core gRPC Service

A project template for creating a gRPC service using ASP.NET Core, with optional support for publishing as native AOT.

[C#](#) [Linux](#) [macOS](#) [Windows](#) [Cloud](#) [Service](#) [Web](#)



[Back](#)

[Next](#)

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Type here to search



Configure your new project

Console App C# Linux macOS Windows Console

Project name

ConsoleApp1

Location

C:\Users\shouwick\Desktop\IITGN\playground



Solution name i

ConsoleApp1

Place solution and project in the same directory

Project will be created in "C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\"

Back Next

33

19:14

23-03-2025

Type here to search

Additional information

Console App C# Linux macOS Windows Console

Framework

.NET 8.0 (Long Term Support)

Enable container support

Container OS

Linux

Container build type

Dockerfile

Do not use top-level statements

Enable native AOT publish

Back Create

34

Additional information

Console App C# Linux macOS Windows Console

Framework ⓘ

.NET 8.0 (Long Term Support)

Enable container support ⓘ

Container OS ⓘ

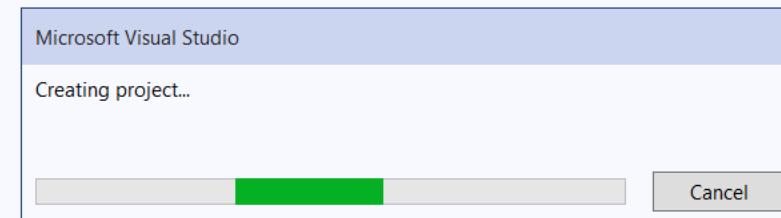
Linux

Container build type ⓘ

Dockerfile

Do not use top-level statements ⓘ

Enable native AOT publish ⓘ



Back

Create

35

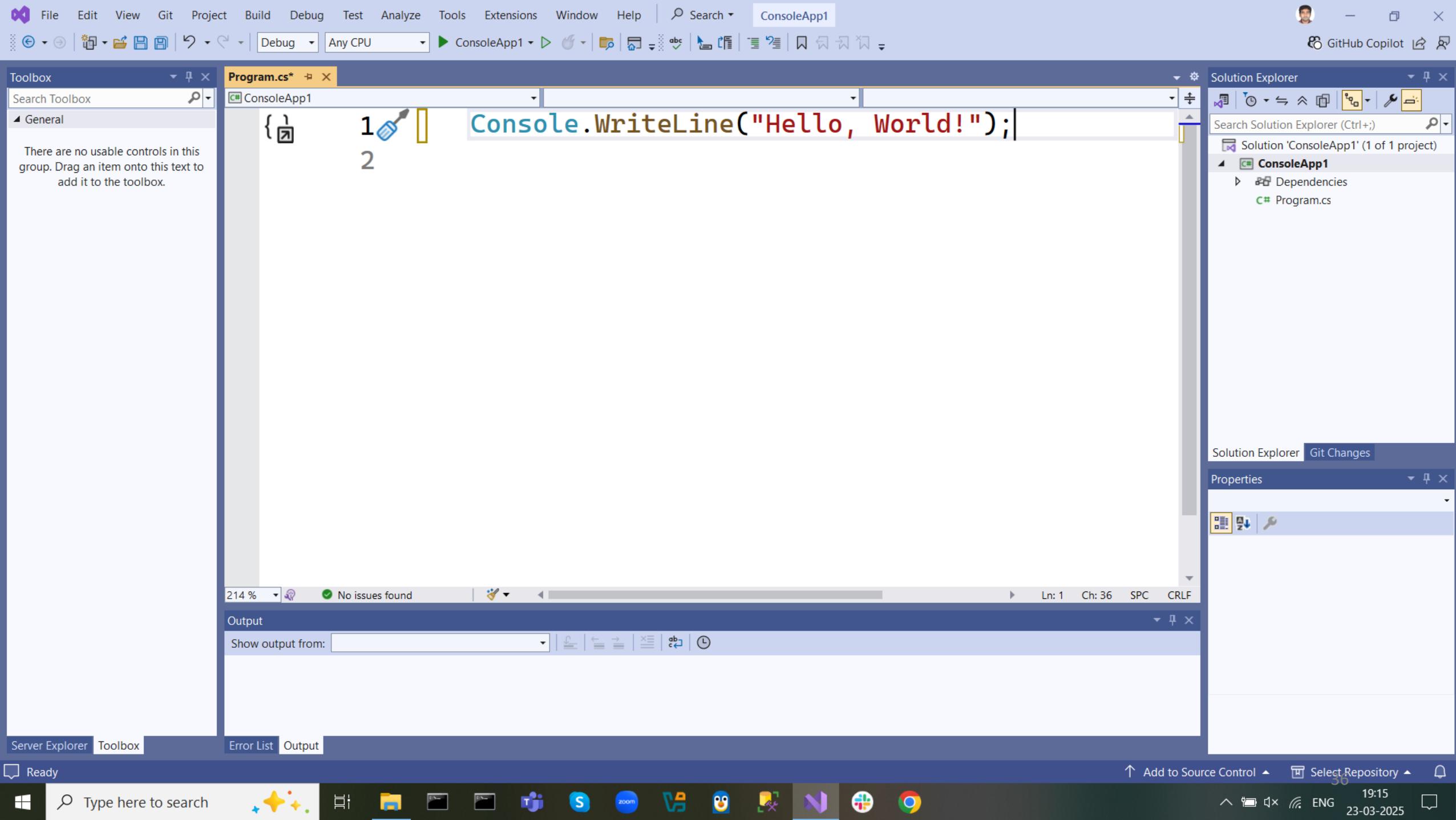
19:14

23-03-2025



Type here to search







< > ^ IITGN >

Search IIT... ?

Quick access

- This PC
- 3D Objects
- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- Windows (C:)
- Network



cache_test



CS202



playground



reviews

Date created: 22-03-2025 14:42
Size: 10.3 KB
Folders: ConsoleApp1

4 items



Type here to search





IITGN > playground >



Search pla... 🔎

Quick access

This PC

3D Objects

Desktop

Documents

Downloads

Music

Pictures

Videos

Windows (C:)

Network



ConsoleApp1

1 item



Type here to search



38

19:15
23-03-2025

ENG



← → ⌂ ⌃ ⌄ IITGN > playground > ConsoleApp1 >

Search Co... 🔎

Quick access

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Desktop

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Downloads

Music

Pictures

Videos

Windows (C:)

Network



.sarif



bin



obj



C# ConsoleApp1.csproj
C# Project File
252 bytes



17 ConsoleApp1.sln
Visual Studio Solution
1.10 KB



Program
CS File
105 bytes

6 items



Type here to search



39 19:16
23-03-2025 ENG



IITGN > playground > ConsoleApp1 >

Quick access

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Downloads

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Pictures

Videos

Windows (C:)

Network



.sarif



bin



obj

C# ConsoleApp1.csproj
C# Project File
252 bytes17 ConsoleApp1.sln
Visual Studio Solution
1.10 KB

Type here to search





Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs* □ X

ConsoleApp1

```
{ 1 Console.WriteLine("Hello, World!"); 2 }
```

214 % No issues found

Output

Show output from:

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Program.cs

Solution Explorer Git Changes

Properties

File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help | Search | ConsoleApp1

GitHub Copilot

Toolbox

Program.cs

```
<Project Sdk="Microsoft.NET.Sdk">
  <PropertyGroup>
    <OutputType>Exe</OutputType>
    <TargetFramework>net8.0</TargetFramework>
    <ImplicitUsings>enable</ImplicitUsings>
    <Nullable>enable</Nullable>
  </PropertyGroup>
</Project>
```

Solution Explorer

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

- Dependencies
- Analyzers
- Frameworks
- Program.cs

Solution Explorer Git Changes

Properties

ConsoleApp1 Project Properties

Misc

File Name	ConsoleApp1.csproj
Full Path	C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\
Project Folder	C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\

File Name
Name of the project file.

Server Explorer Toolbox Error List Output

Ready

Type here to search

Add to Source Control Select Repository

19:18 23-03-2025 ENG

C:\Users\shouvik\Desktop\IITGN\playground\ConsoleApp1\ConsoleApp1.csproj - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

ConsoleApp1.csproj ConsoleApp1.sln

```
1 <Project Sdk="Microsoft.NET.Sdk">
2
3   <PropertyGroup>
4     <OutputType>Exe</OutputType>
5     <TargetFramework>net8.0</TargetFramework>
6     <ImplicitUsings>enable</ImplicitUsings>
7     <Nullable>enable</Nullable>
8   </PropertyGroup>
9
10 </Project>
11
```

eXtensible Markup Language file length : 249 lines : 11 Ln : 2 Col : 1 Pos : 36 Windows (CR LF) UTF-8 BOM OVR

Type here to search

19:19 23-03-2025

*C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\ConsoleApp1.sln - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

ConsoleApp1.sln X

```
1 Microsoft Visual Studio Solution File, Format Version 12.00
2 # Visual Studio Version 17
3 VisualStudioVersion = 17.13.35913.81 d17.13
4 MinimumVisualStudioVersion = 10.0.40219.1
5 Project("{FAE04EC0-301F-11D3-BF4B-00C04F79EFBC}") = "ConsoleApp1", "ConsoleApp1.csproj", "{D244104A-916C-45A5-946F-7DF4E45A3255}"
6 EndProject
7 Global
8     GlobalSection(SolutionConfigurationPlatforms) = preSolution
9         Debug|Any CPU = Debug|Any CPU
10        Release|Any CPU = Release|Any CPU
11    EndGlobalSection
12    GlobalSection(ProjectConfigurationPlatforms) = postSolution
13        {D244104A-916C-45A5-946F-7DF4E45A3255}.Debug|Any CPU.ActiveCfg = Debug|Any CPU
14        {D244104A-916C-45A5-946F-7DF4E45A3255}.Debug|Any CPU.Build.0 = Debug|Any CPU
15        {D244104A-916C-45A5-946F-7DF4E45A3255}.Release|Any CPU.ActiveCfg = Release|Any CPU
16        {D244104A-916C-45A5-946F-7DF4E45A3255}.Release|Any CPU.Build.0 = Release|Any CPU
17    EndGlobalSection
18    GlobalSection(SolutionProperties) = preSolution
19        HideSolutionNode = FALSE
20    EndGlobalSection
21    GlobalSection(ExtensibilityGlobals) = postSolution
22        SolutionGuid = {6B2F209C-B90D-4C83-A66F-6FA5C7E514F1}
23    EndGlobalSection
24 EndGlobal
25
26
```

Normal text file

length : 1,131 lines : 26 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 BOM OVR

Type here to search

19:19 23-03-2025



IITGN > playground > ConsoleApp1



Quick access

This PC

3D Objects

Desktop

Documents

Downloads

Music

Pictures

Videos

Windows (C:)

Network



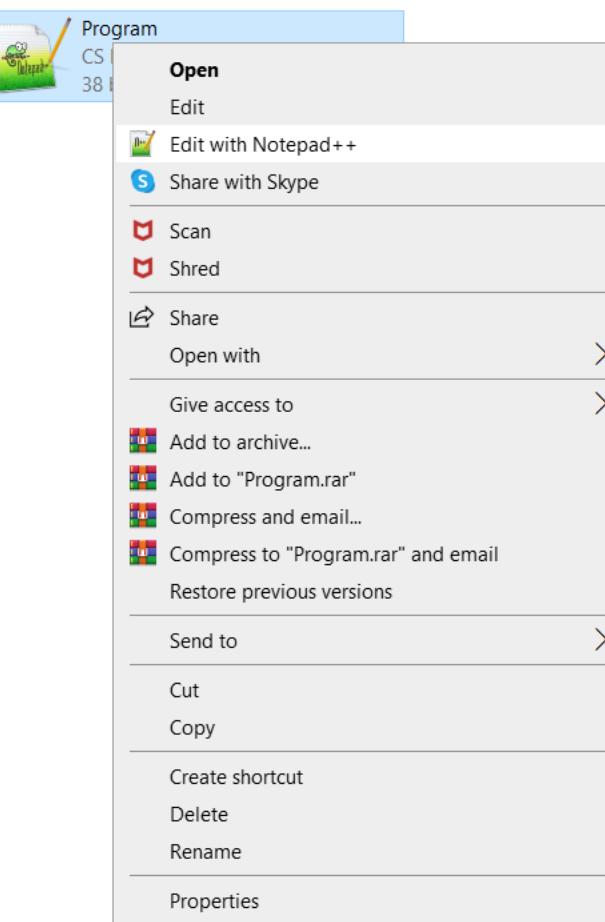
.sarif



bin



obj

ConsoleApp1.csproj
C# Project File
252 bytesConsoleApp1.sln
Visual Studio Solution
1.10 KB

Type here to search



C:\Users\shouvik\Desktop\IITGN\playground\ConsoleApp1\Program.cs - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

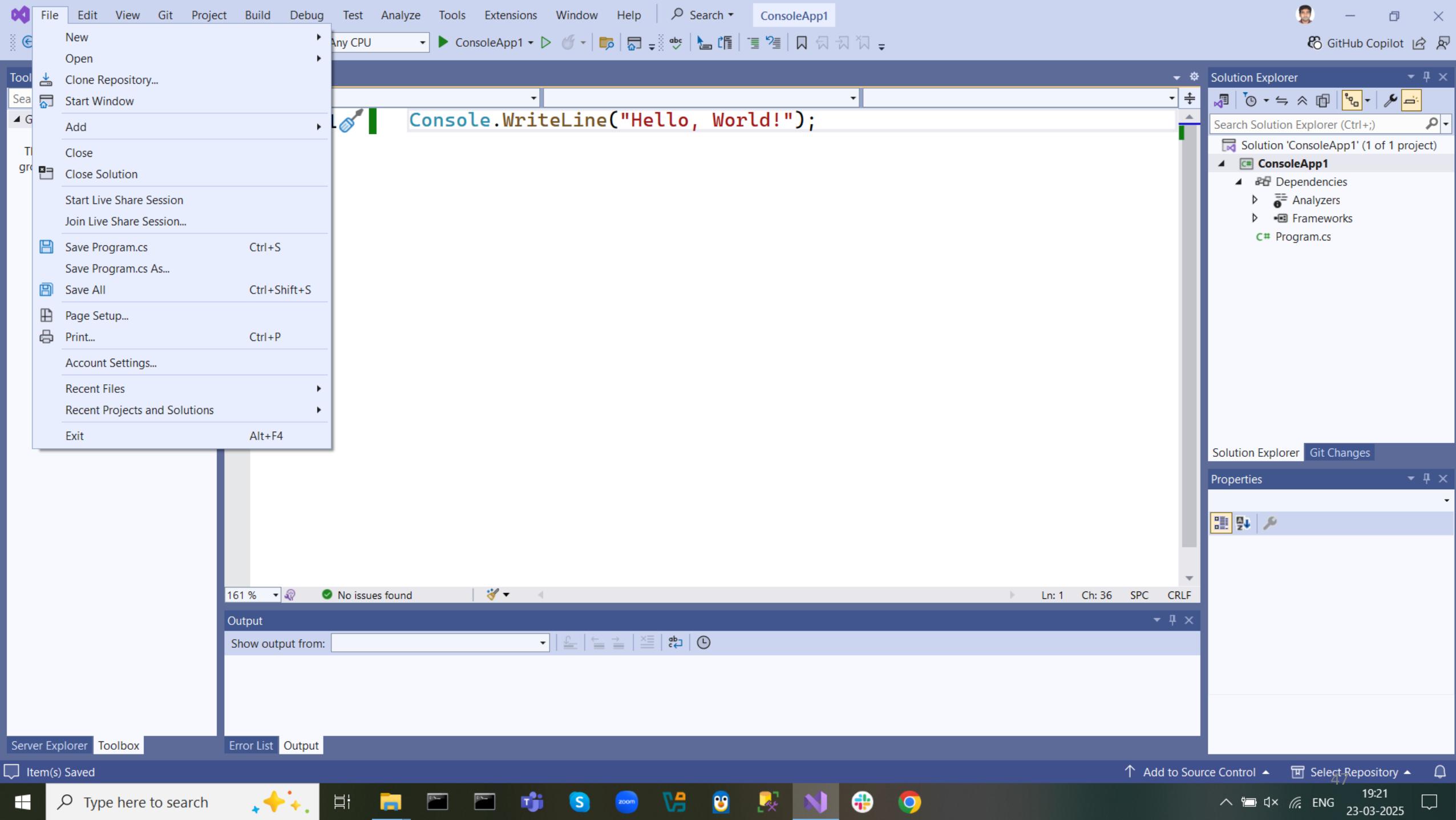
Program.cs

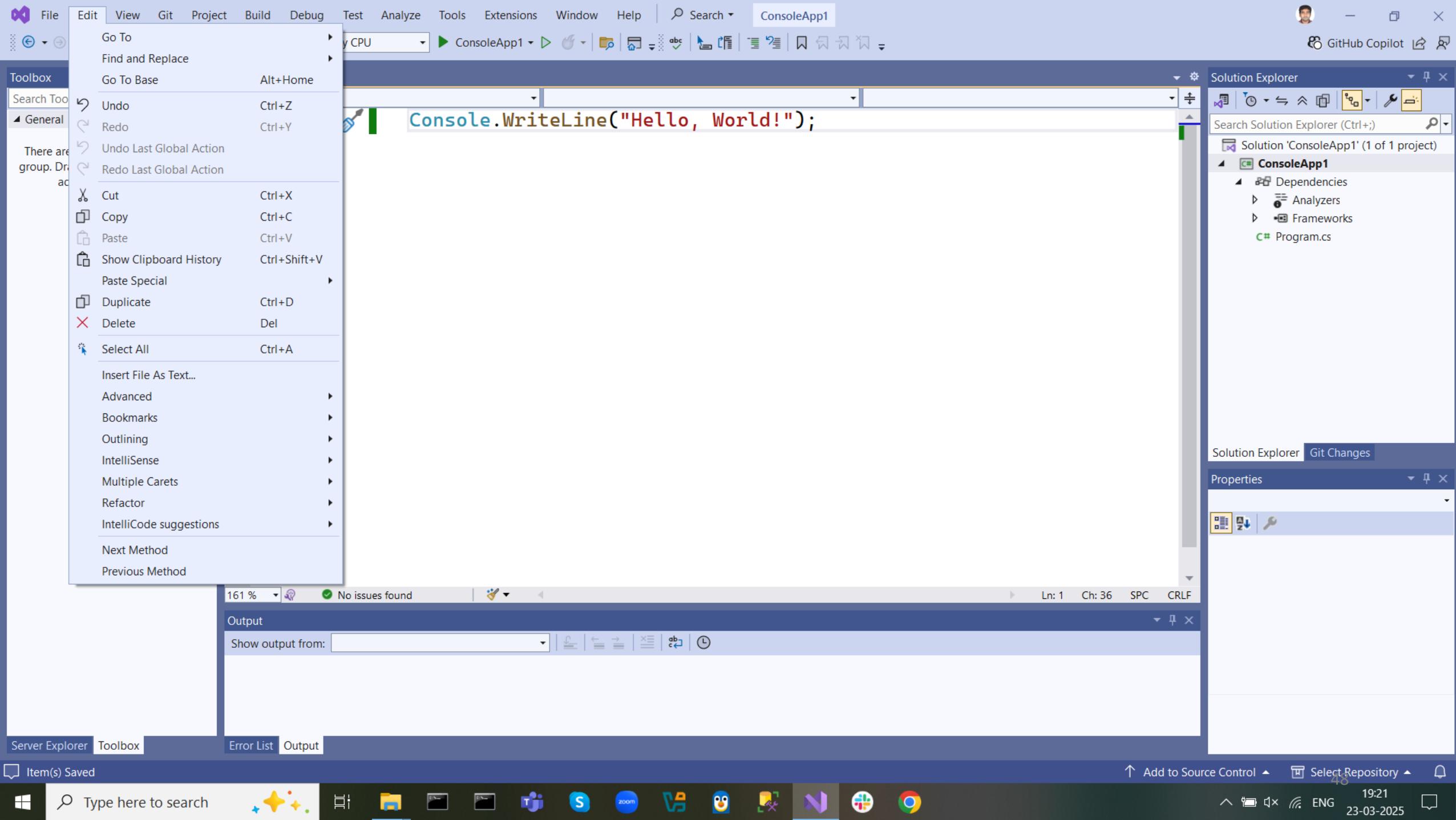
```
1 Console.WriteLine("Hello, World!");
```

length : 35 lines : 1 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 BOM INS

Type here to search

19:20 23-03-2025





File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help Search ConsoleApp1 GitHub Copilot

Console.WriteLine("Hello, World!");

Solution Explorer

Search Solution Explorer (Ctrl+;) Solution 'ConsoleApp1' (1 of 1 project) ConsoleApp1 Dependencies Analyzers Frameworks Program.cs

Toolbox

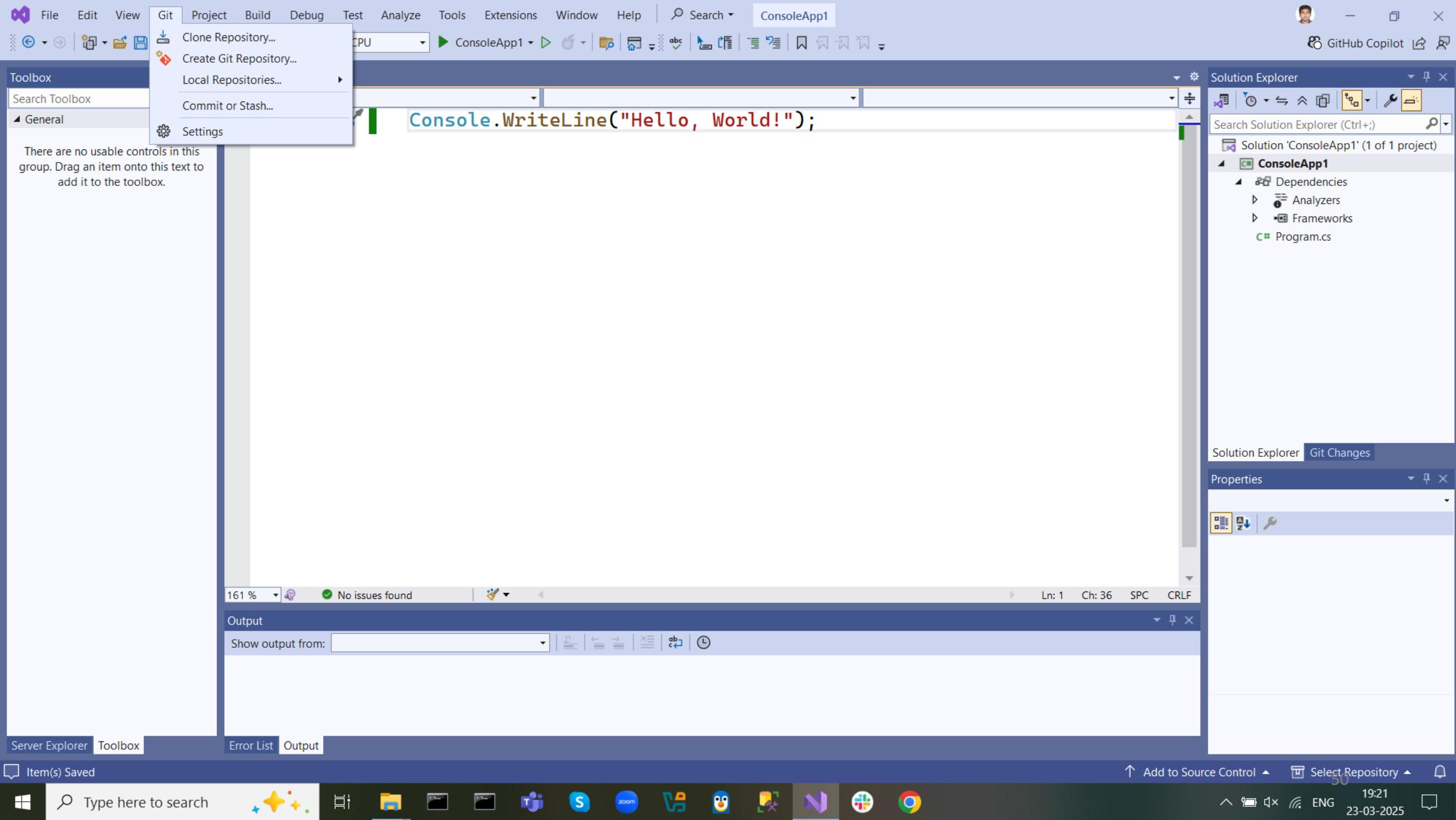
Search Toolbox General There are no usable items in this group. Drag an item here or add it to a group.

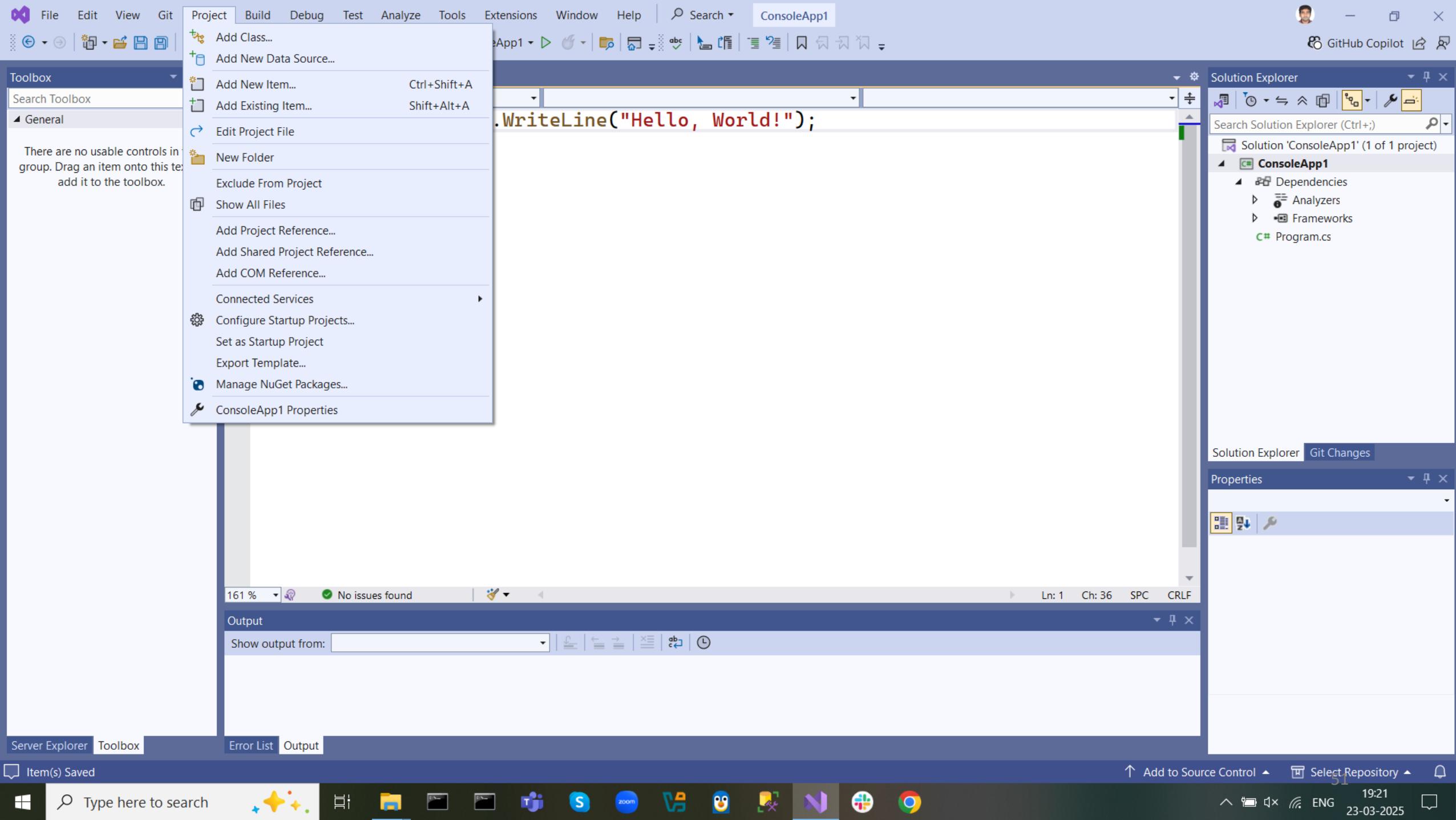
Open Open With... Solution Explorer Ctrl+Alt+L Git Changes Ctrl+0, Ctrl+G Git Repository Ctrl+0, Ctrl+R Team Explorer Ctrl+\, Ctrl+M Server Explorer Ctrl+Alt+S SQL Server Object Explorer Ctrl+\, Ctrl+S Test Explorer Ctrl+E, T GitHub Copilot Chat Ctrl+\, C Bookmark Window Ctrl+K, Ctrl+W Call Hierarchy Ctrl+Alt+K Class View Ctrl+Shift+C Code Definition Window Ctrl+\, D Object Browser Ctrl+Alt+J Error List Ctrl+\, E Output Ctrl+Alt+O Task List Ctrl+\, T Toolbox Ctrl+Alt+X Notifications Terminal Ctrl+` Other Windows Toolbars Full Screen Shift+Alt+Enter All Windows Shift+Alt+M Navigate Backward Ctrl+- Navigate Forward Ctrl+Shift+- Next Task Previous Task Properties Window F4 Property Pages Shift+F4

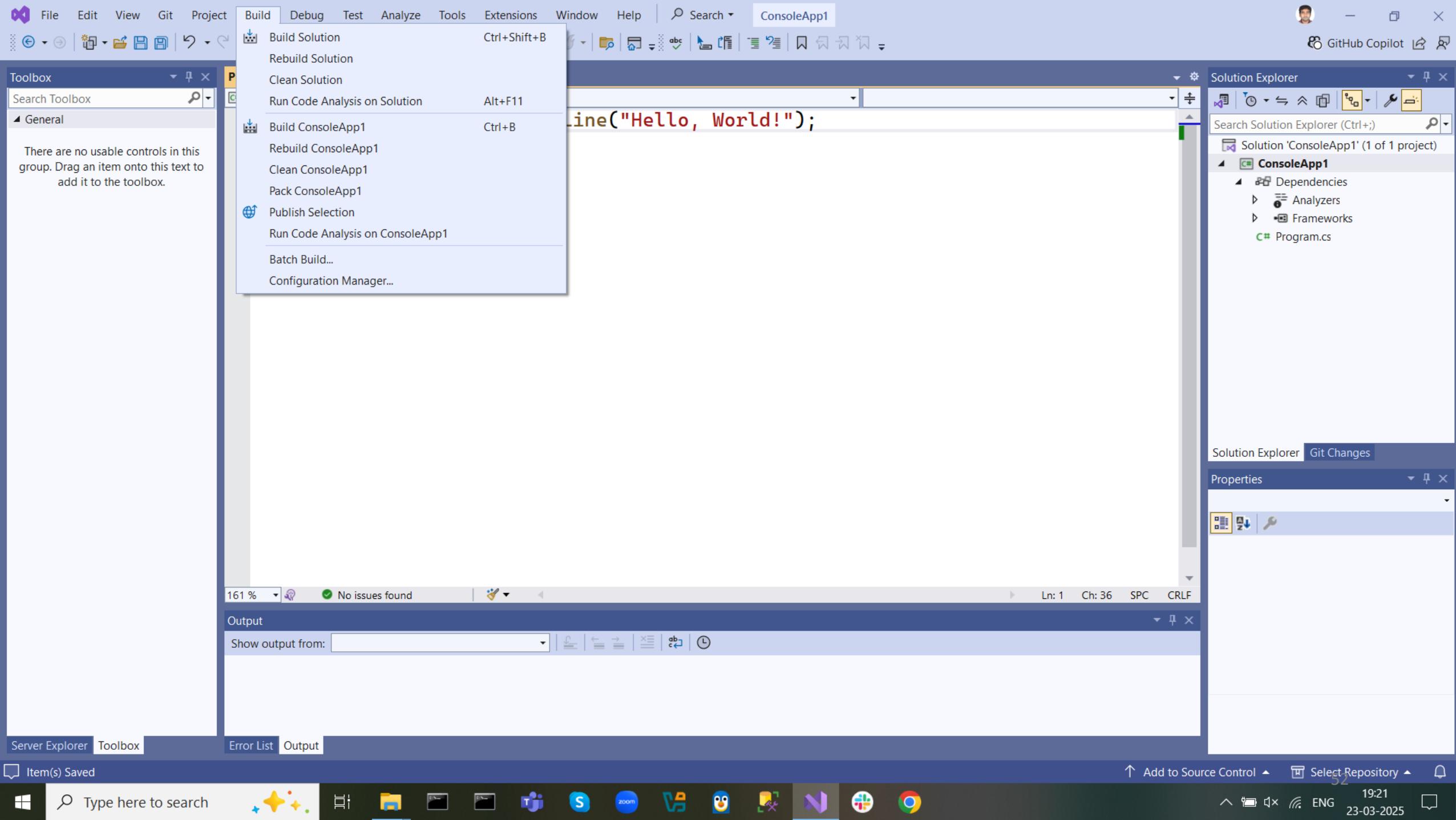
Server Explorer Toolbox Error List Output

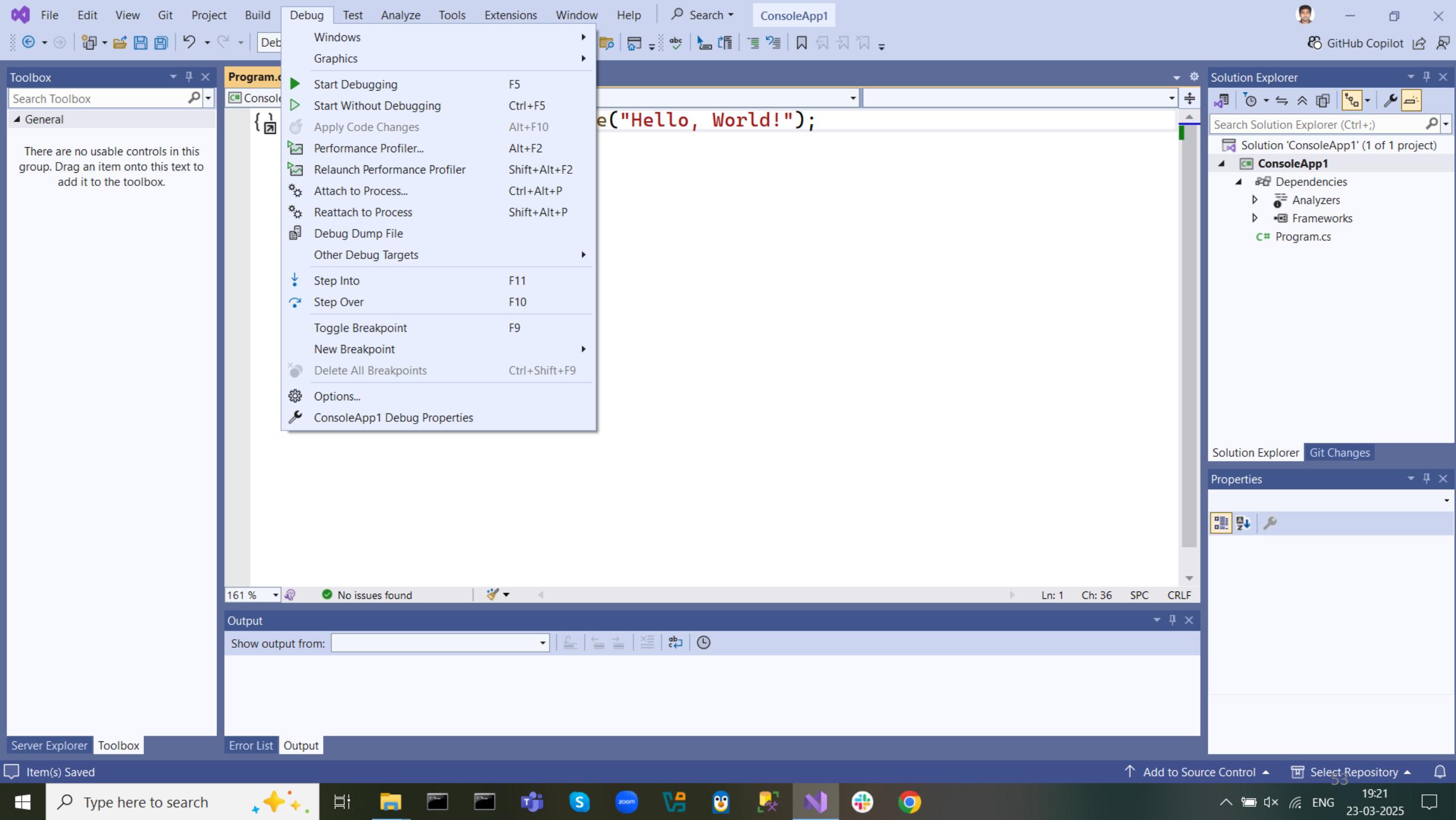
Item(s) Saved Add to Source Control Select Repository 19:21 23-03-2025 ENG

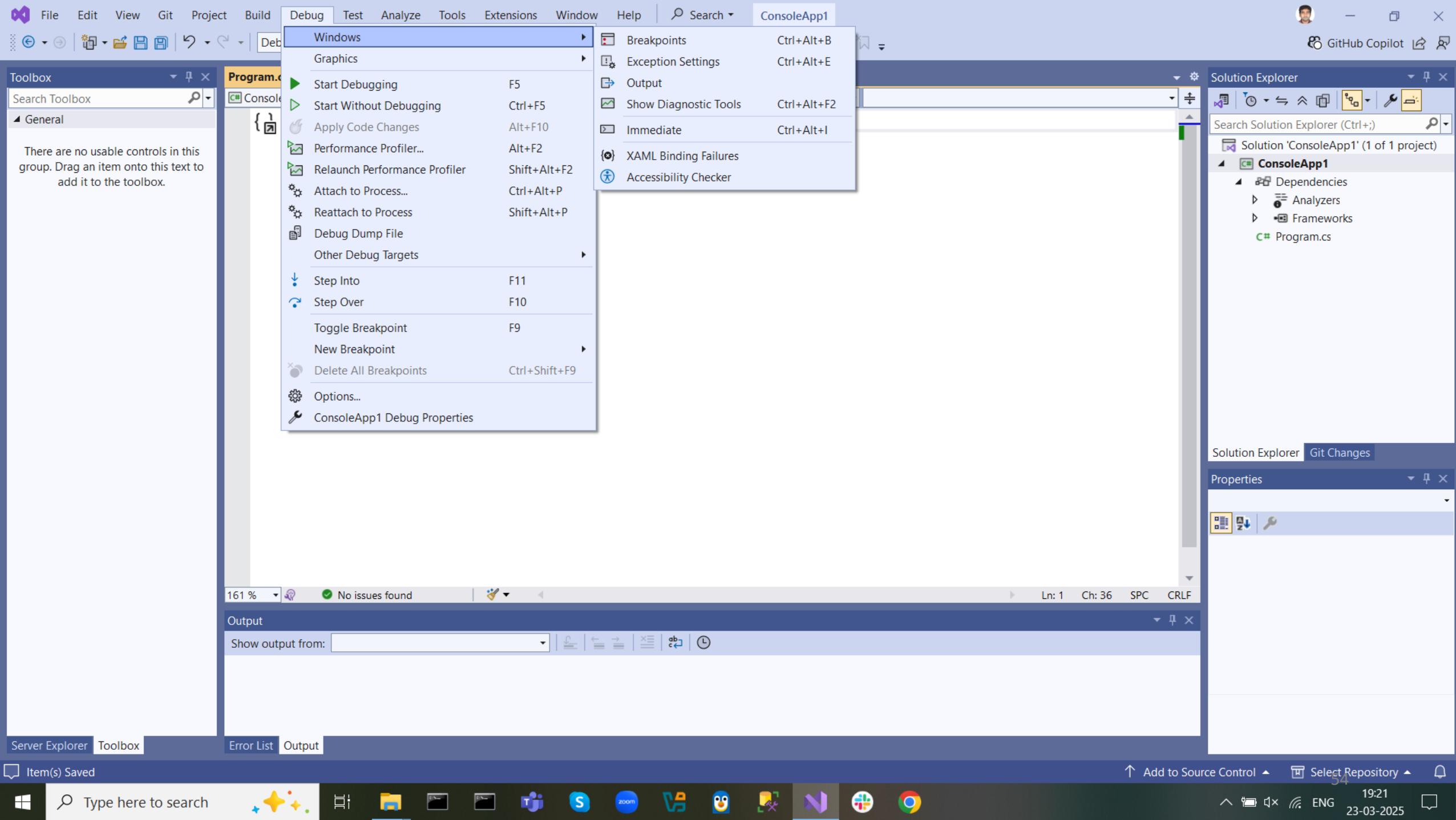
Type here to search

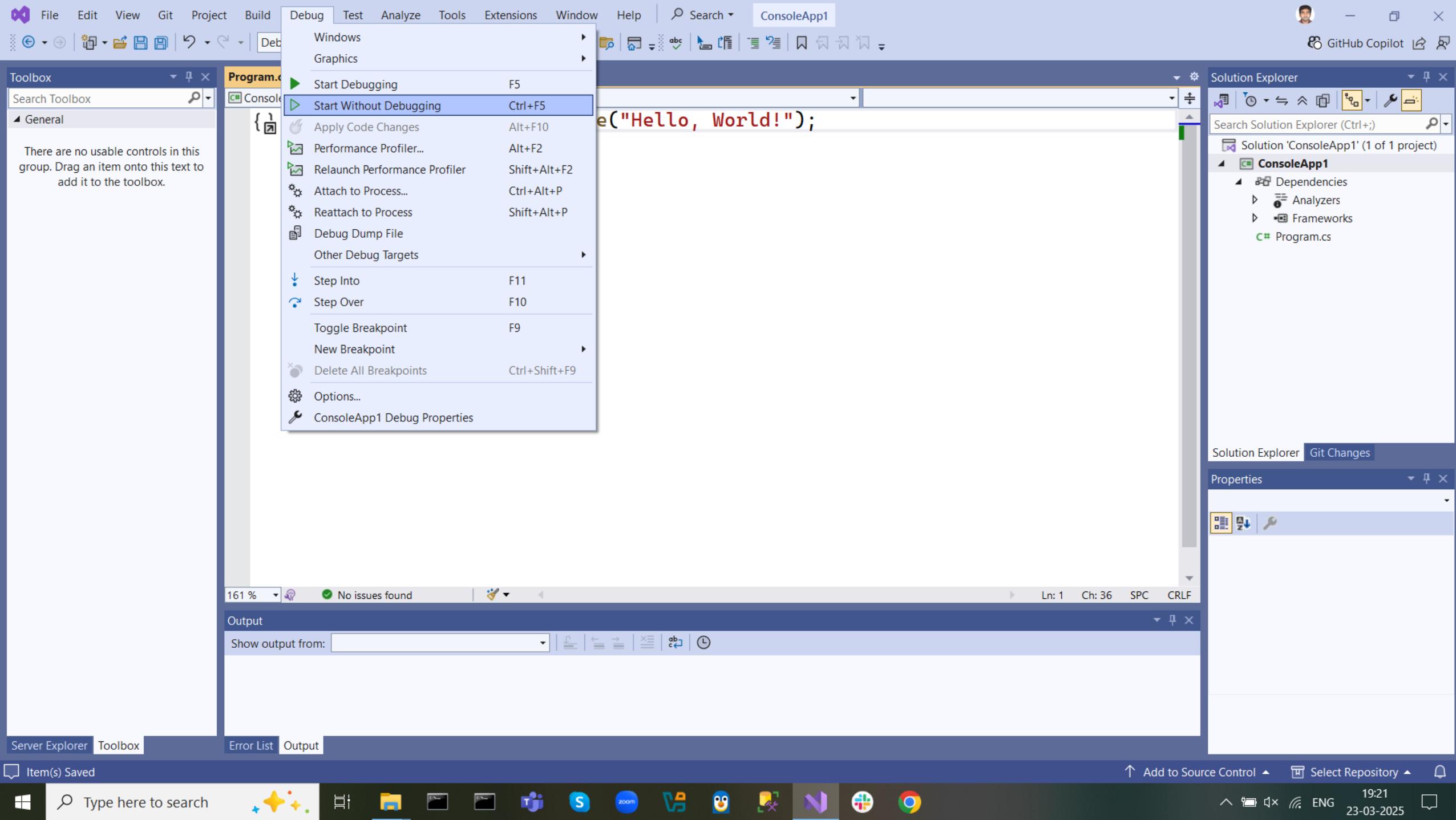


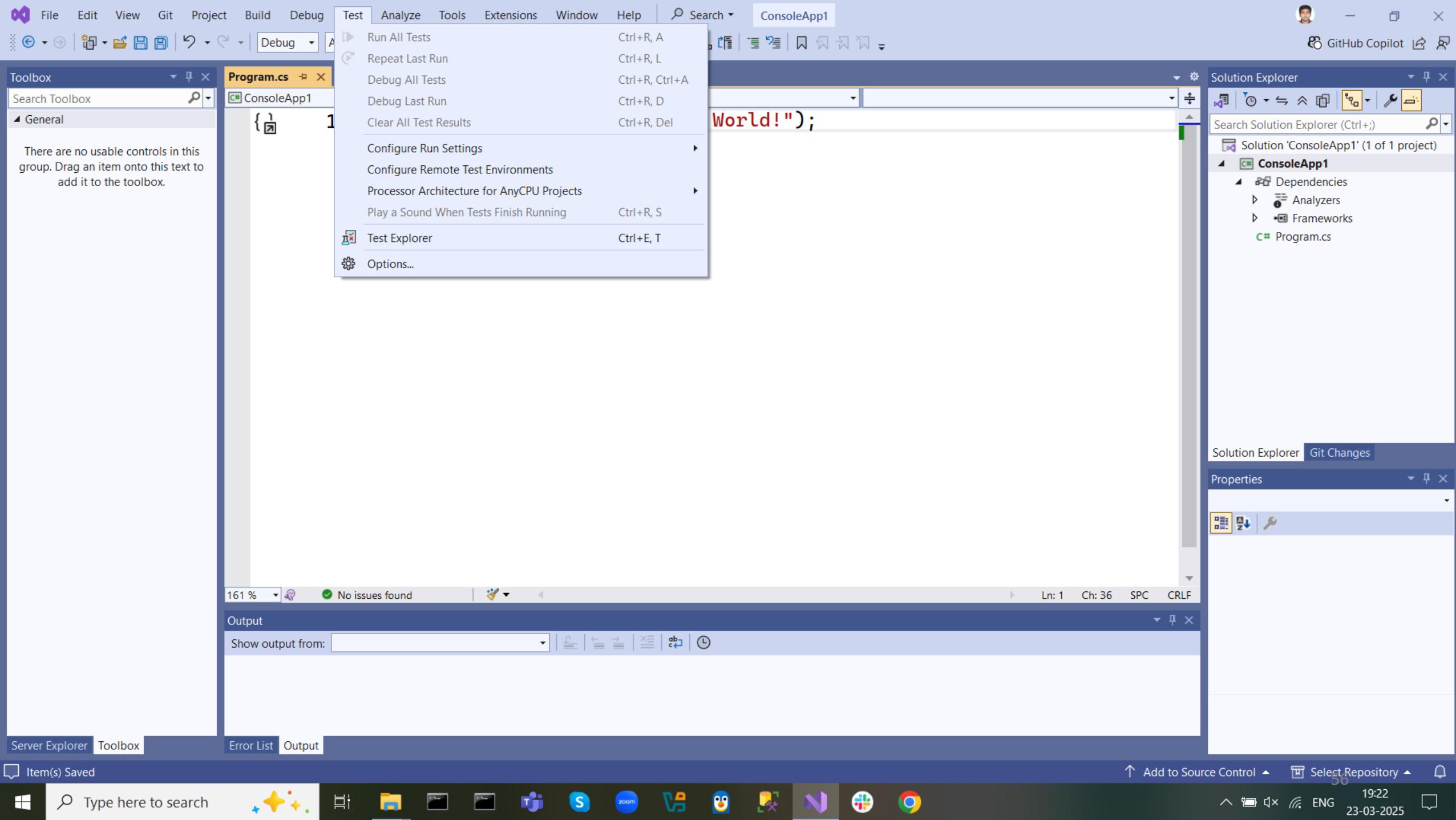


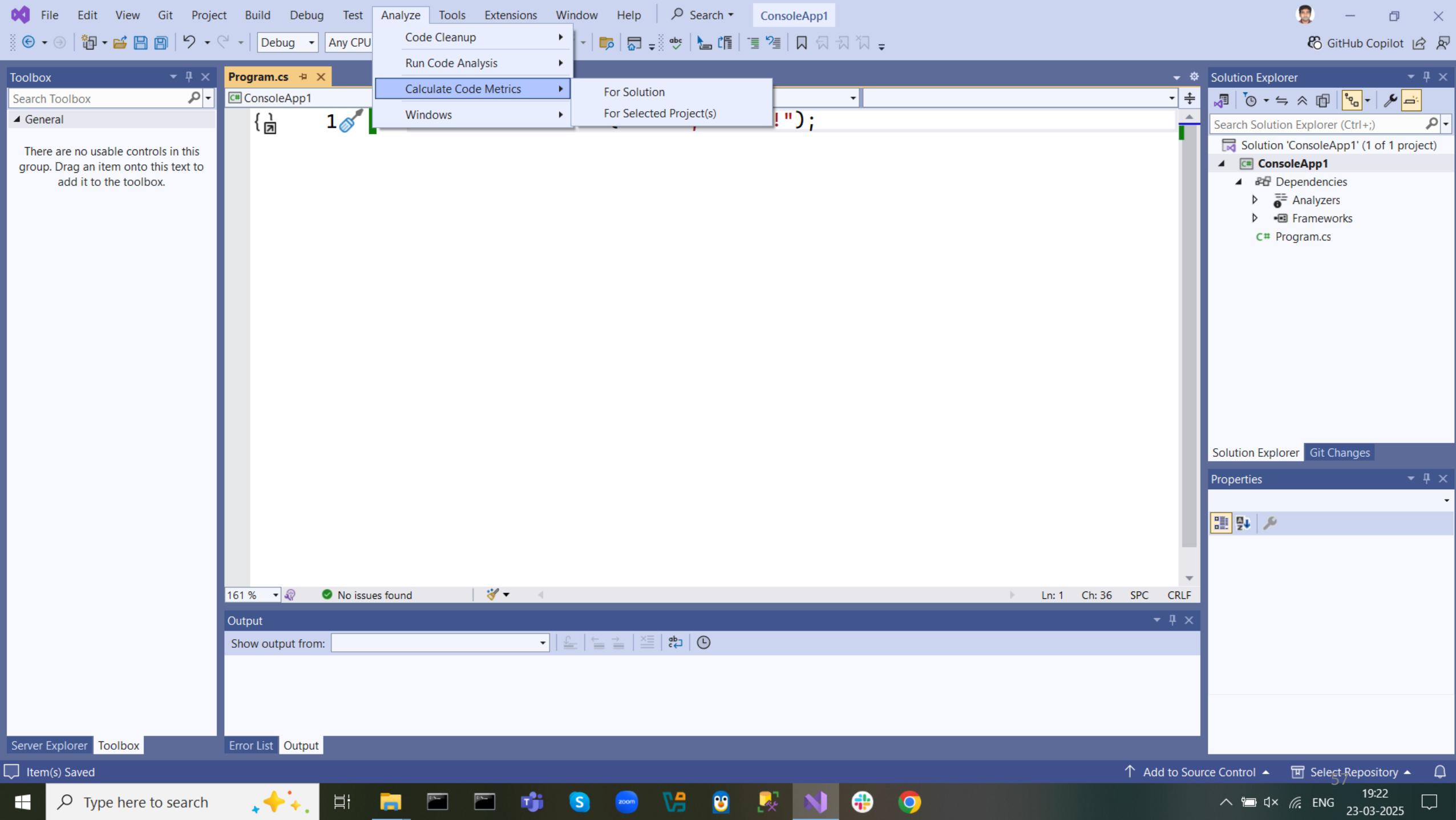












File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help Search ConsoleApp1 GitHub Copilot

Toolbox Search Toolbox General There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs Debug Any CPU

Get Tools and Features... Manage Preview Features Open Static Analysis Results as SARIF Connect to Database... Connect to Server... Add SharePoint Connection... SQL Server Code Snippets Manager... Ctrl+K, Ctrl+B Choose Toolbox Items... NuGet Package Manager PreEmptive Protection - Dotfuscator Community Create GUID Error Lookup Spy++ WCF Service Configuration Editor External Tools... Theme Command Line Import and Export Settings... Customize... Options...

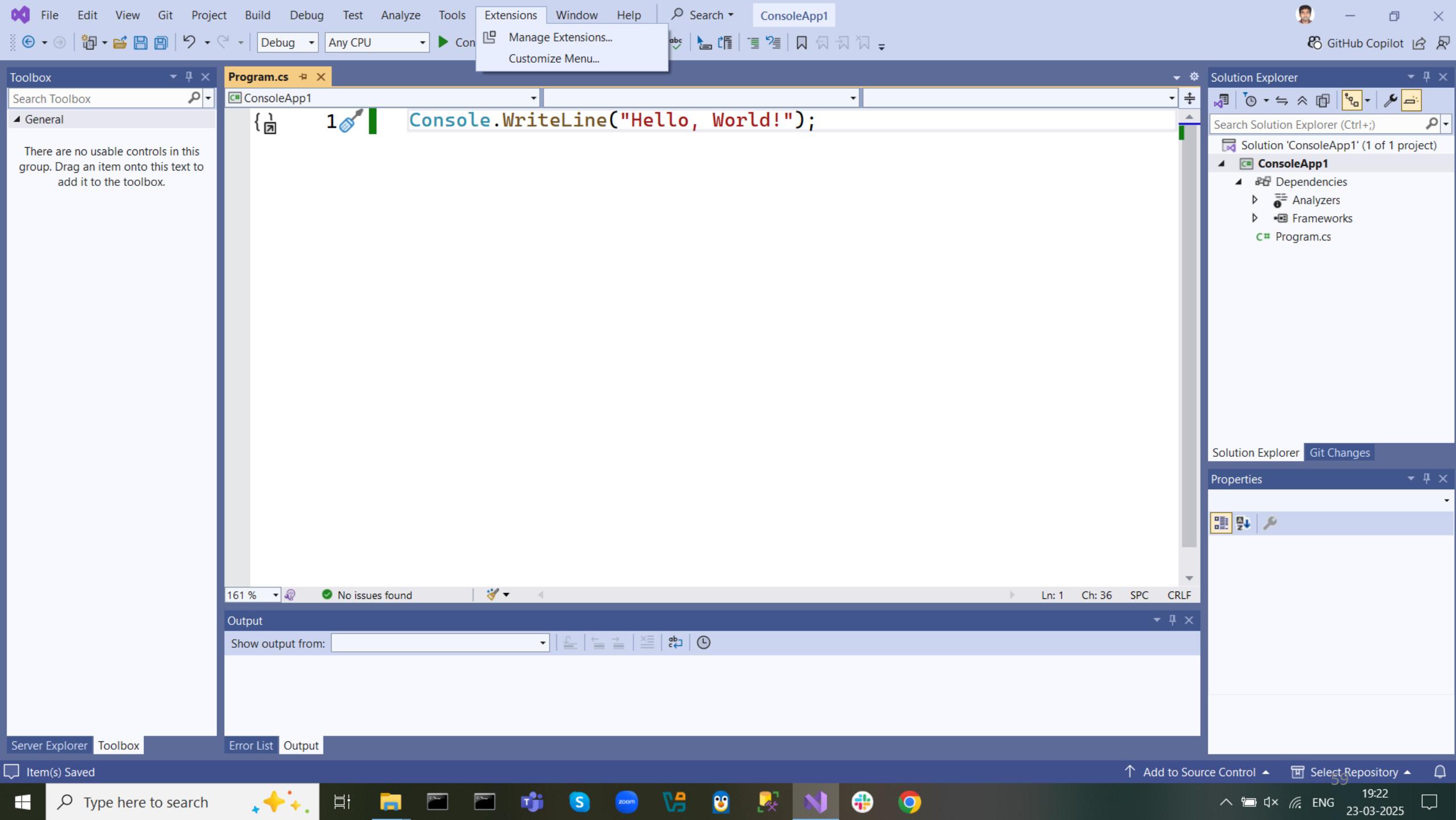
161 % No issues found Output Show output from: Ln: 1 Ch: 36 SPC CRLF

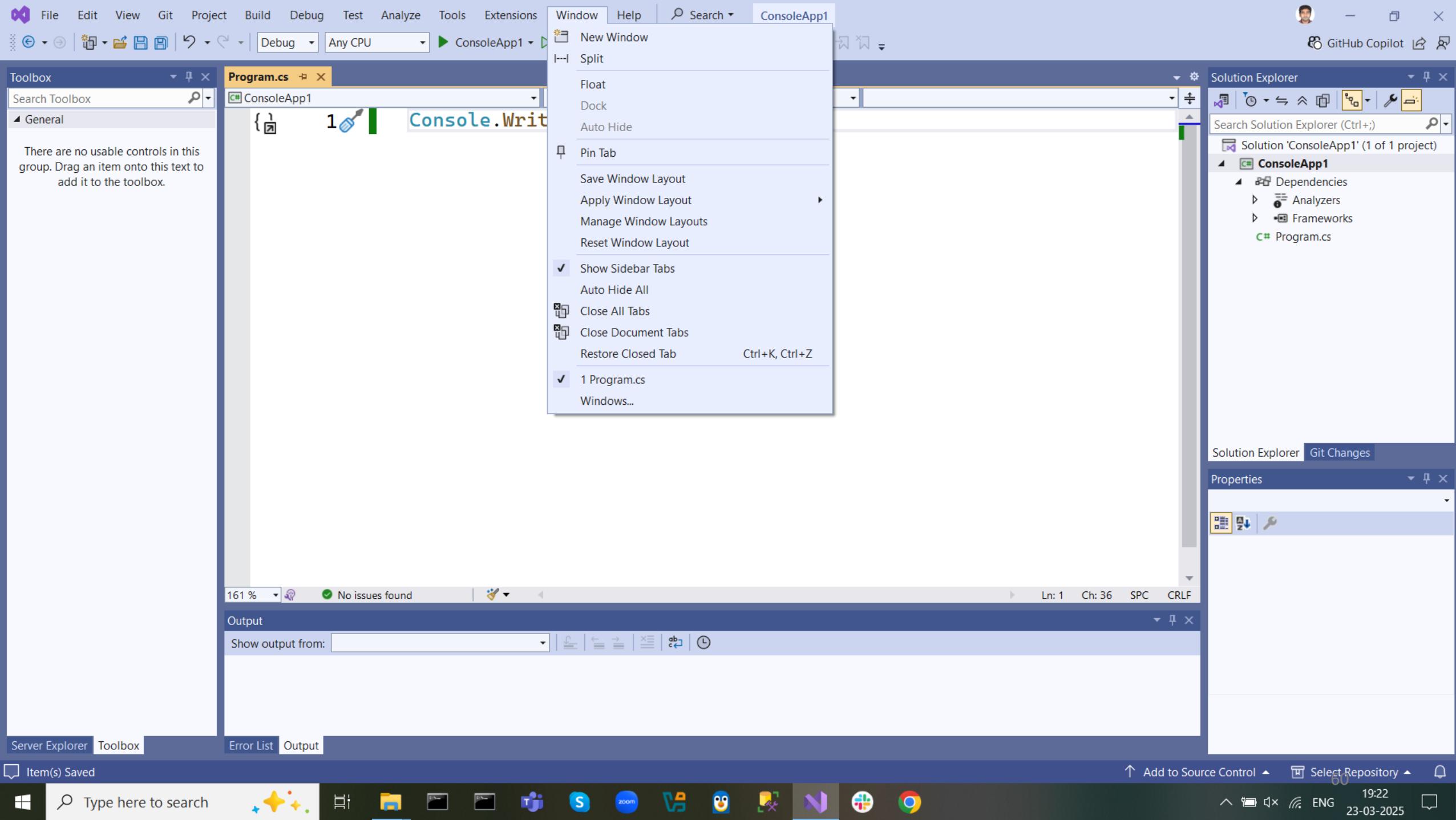
Server Explorer Toolbox Error List Output Item(s) Saved Add to Source Control Select Repository 19:22 23-03-2025

Solution Explorer Search Solution Explorer (Ctrl+;) Solution 'ConsoleApp1' (1 of 1 project) ConsoleApp1 Dependencies Analyzers Frameworks Program.cs

Properties Git Changes

Type here to search





File Edit View Git Project Build Debug Test Analyze Tools Extensions Window

Help Search ConsoleApp1

View Help Ctrl+F1
Add and Remove Help Content Ctrl+Alt+F1
Set Help Preference
Getting Started
Tips and Tricks
Keyboard Shortcut Reference
What's New?
Send Feedback
Explore Feature Requests
Join Us on Social Media
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Release Notes
Roadmap
Technical Support
Check Service Status
Visual Studio Performance Manager
Privacy
Register Visual Studio
My Subscription
About Microsoft Visual Studio

GitHub Copilot

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

Console.WriteLine

161 %

No issues found

Output

Show output from:

Ln: 1 Ch: 36 SPC CRLF

Server Explorer

Error List

Output

Item(s) Saved

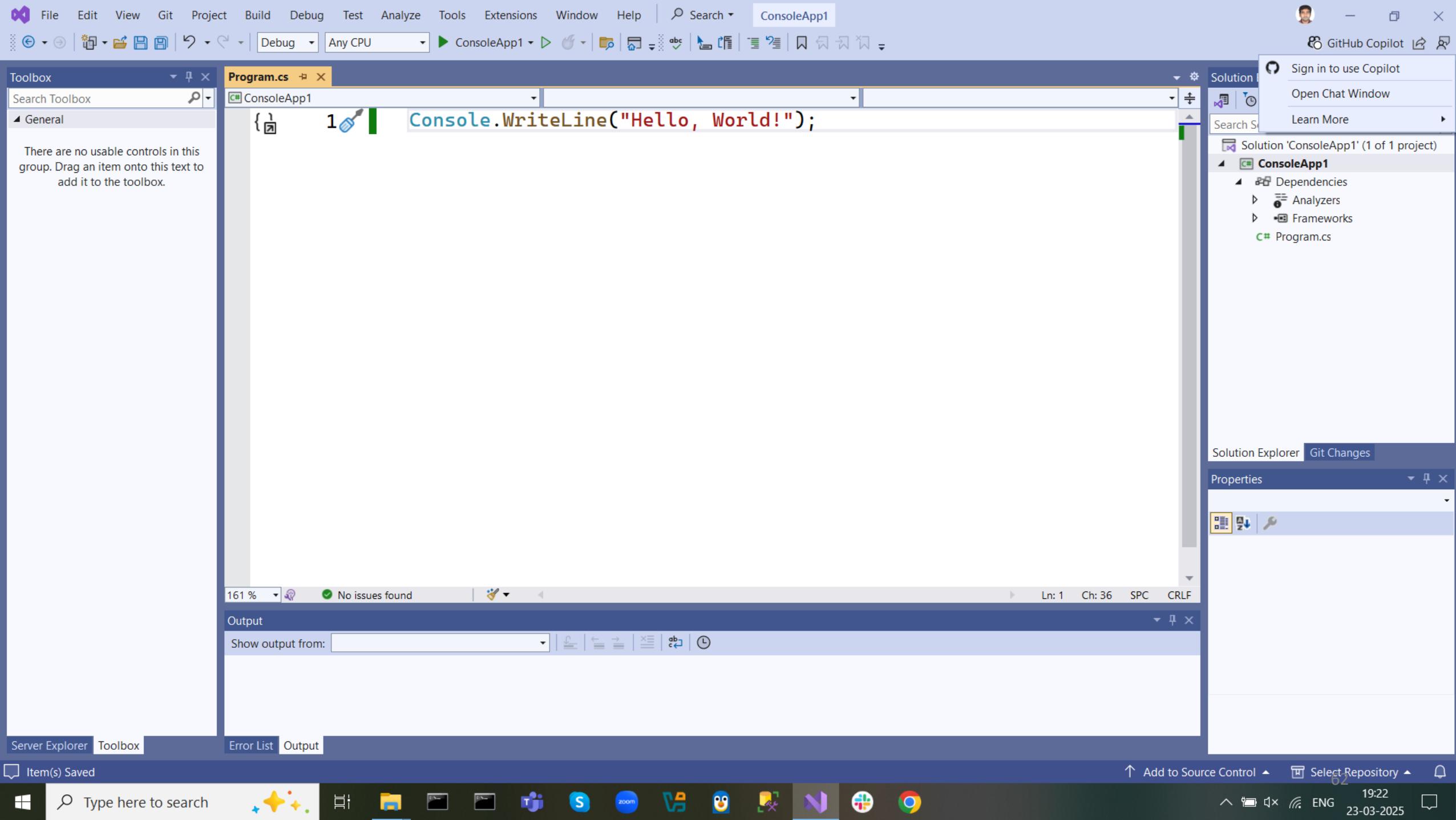
Add to Source Control

Select Repository

19:22

ENG

23-03-2025





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
C# ConsoleApp1
    1 1 Console.WriteLine("Hello, World!");
```

161 % No issues found

Output

Show output from:

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Solution Explorer Git Changes

Properties

Program.cs File Properties

Advanced

Build Action C# compiler

Copy to Output Dir Do not copy

Custom Tool

Custom Tool Names

Misc

File Name Program.cs

Full Path C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\Program.cs

File Name

Name of the file or folder.



Toolbox ▾ X

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs ▾ X

C# ConsoleApp1

1 1

```
{  
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <img alt="Task List
```



GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
C# ConsoleApp1
    1 1 Console.WriteLine("Hello, World!");
```

161 % No issues found

Output

Show output from:

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

- Dependencies
- Analyzers
- Frameworks

Program.cs

Solution Explorer Git Changes

Properties

Program.cs File Properties

Advanced

- Build Action C# compiler
- Copy to Output Dir Do not copy
- Custom Tool
- Custom Tool Names

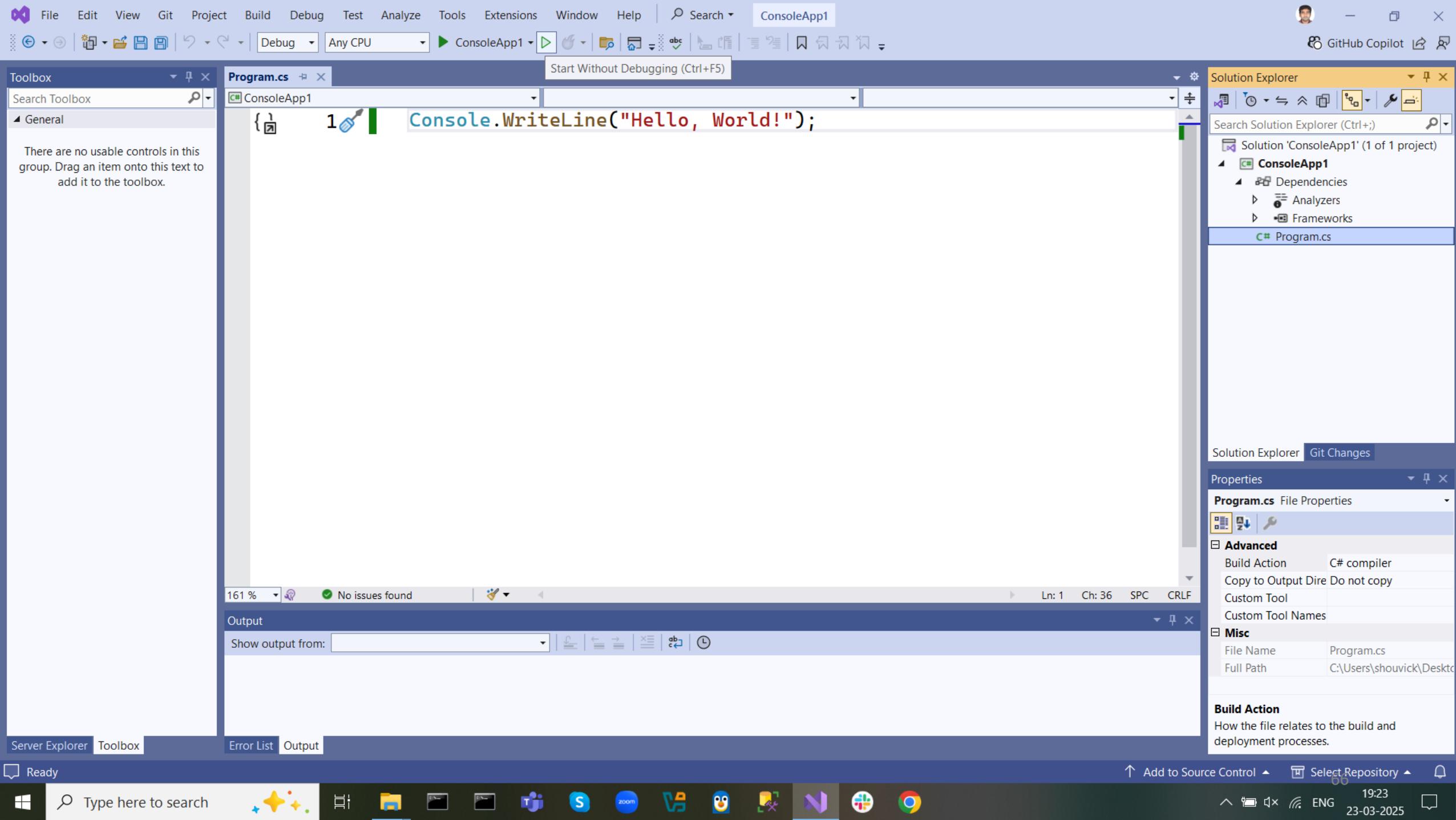
Misc

File Name Program.cs

Full Path C:\Users\shouwick\Desktop\ConsoleApp1\ConsoleApp1\Program.cs

Build Action

How the file relates to the build and deployment processes.





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
C# ConsoleApp1
    1 1 Console.WriteLine("Hello, World!");
```

161 % No issues found

Output

Show output from:

```
Build started at 19:23...
1>----- Build started: Project: ConsoleApp1, Configuration: Debug Any CPU -----
1>Skipping analyzers to speed up the build. You can execute 'Build' or 'Rebuild' command to run analyzers.
```

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

- Dependencies
- Analyzers
- Frameworks

Program.cs

Solution Explorer Git Changes

Properties

Program.cs File Properties

Advanced

- Build Action C# compiler
- Copy to Output Dir Do not copy
- Custom Tool
- Custom Tool Names

Misc

- File Name Program.cs
- Full Path C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\Program.cs

Build Action

How the file relates to the build and deployment processes.



Toolbox  **Program.cs** 

Search Toolbox  C# ConsoleApp1

General Microsoft Visual Studio Debug Console

There are no usable items in this group. Drag an item from the left pane or add it to the toolbox.

Hello, World!

C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.exe (process 13068) exited with code 0 (0x0).

Press any key to close this window . . .

Solution Explorer  Search Solution Explorer (Ctrl+;) 

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

- Dependencies
- Analyzers
- Frameworks

C# Program.cs

Solution Explorer Git Changes

Properties  Program.cs File Properties

Advanced

- Build Action C# compiler
- Copy to Output Directory Do not copy
- Custom Tool
- Custom Tool Names

Misc

- File Name Program.cs
- Full Path C:\Users\shouwick\Desktop\ConsoleApp1\ConsoleApp1.csproj

Build Action

How the file relates to the build and deployment processes.

Output

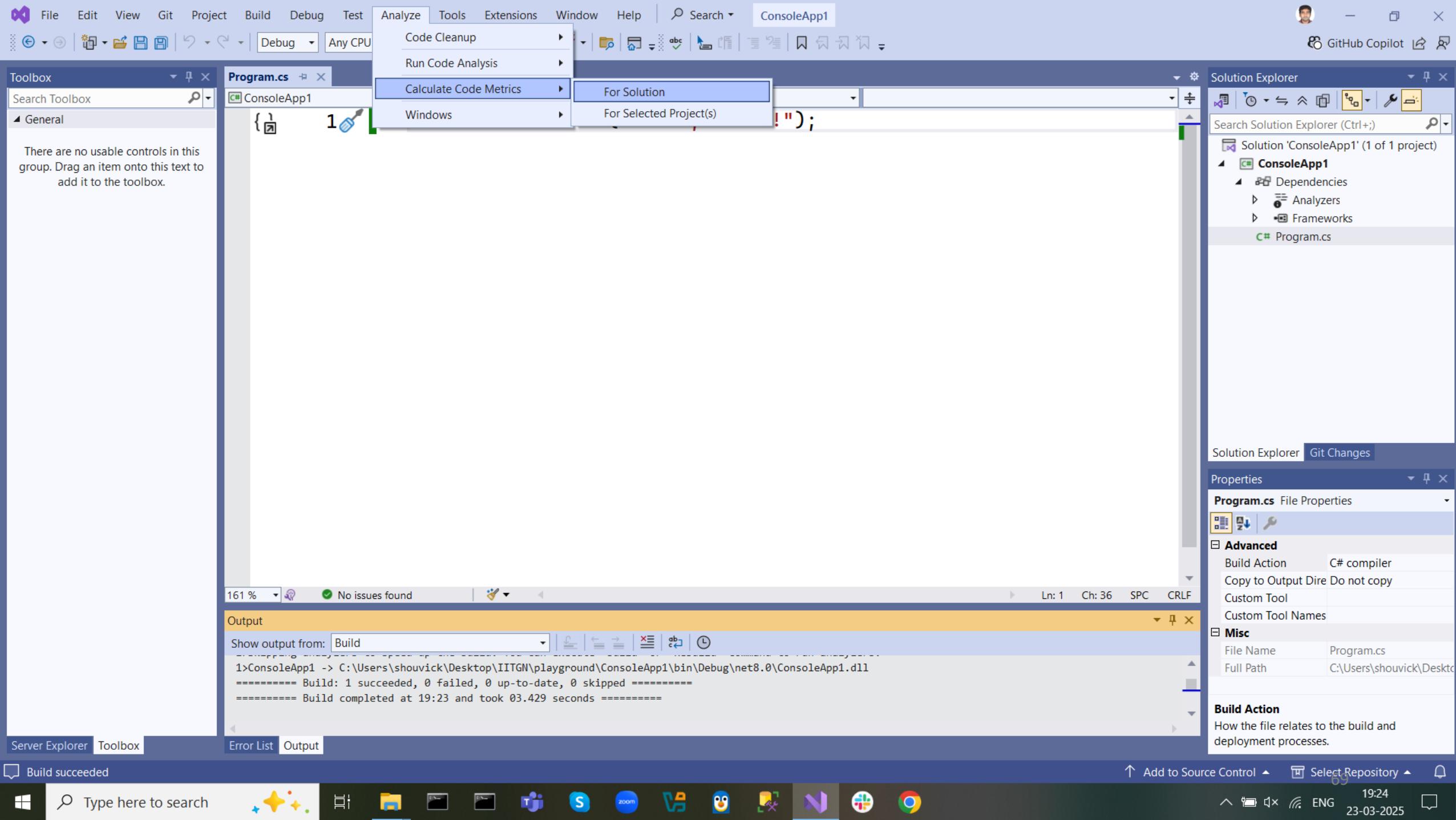
Show output from: Build                                

Ln: 1 Ch: 36 SPC CRLF

Server Explorer  Toolbox  Error List  Output 

Build succeeded  Add to Source Control  Select Repository  19:23 23-03-2025

Type here to search                 ENG 23-03-2025





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
C# ConsoleApp1
{ 1 \Console.WriteLine("Hello, World!");
```

161 % No issues found

Code Metrics Results

Hierarchy	Maintainability Index	Cyclomatic Comple...	Depth of Inheritance	Class Coupling	Lines of Source code	Lines of Executable ...
ConsoleApp1 (Debug)	93	2	1	1	1	2

Code Metrics Results Error List Output

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

Solution Explorer Git Changes

Properties

Program.cs File Properties

Advanced

- Build Action C# compiler
- Copy to Output Dir Do not copy
- Custom Tool
- Custom Tool Names

Misc

- File Name Program.cs
- Full Path C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\Program.cs

Build Action

How the file relates to the build and deployment processes.





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
C# ConsoleApp1
{ 1 \Console.WriteLine("Hello, World!");
```

161 % No issues found

Error List

Code	Description	Project	File	Line
Entire Solution	0 Errors	0 Warnings	0 Messages	Build + IntelliSense

Server Explorer

Error List

Output

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

Solution Explorer

Properties

Program.cs File Properties

Advanced

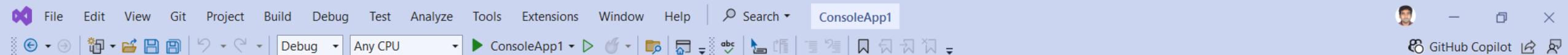
- Build Action C# compiler
- Copy to Output Dir Do not copy
- Custom Tool
- Custom Tool Names

Misc

- File Name Program.cs
- Full Path C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\Program.cs

Build Action

How the file relates to the build and deployment processes.



File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help | Search | ConsoleApp1

Debug Any CPU ConsoleApp1 abc GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
Console.WriteLine("Hello, World!");
```

Quick Actions (Alt+Enter or Ctrl+.)

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

Solution Explorer Git Changes

Properties

Program.cs File Properties

Advanced

- Build Action C# compiler
- Copy to Output Dir Do not copy
- Custom Tool
- Custom Tool Names

Misc

- File Name Program.cs
- Full Path C:\Users\shouvik\Desktop\ConsoleApp1\ConsoleApp1\Program.cs

Error List

No issues found

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Search Error List

Code Description Project File Line

Server Explorer Toolbox

Error List Output





Toolbox ▾ X

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs ▾ X

C# ConsoleApp1

1 `Console.WriteLine("Hello, World!");`

Introduce local for 'Console'

Introduce local for all occurrences of 'Console'

Convert to 'Program.Main' style program

- `Console.WriteLine("Hello, World!");`

+ `Console console = Console;`

+ `console.WriteLine("Hello, World!");`

Preview changes

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Code Description Project File Line

Server Explorer Toolbox Error List Output

Add to Source Control Select Repository

Item(s) Saved

Type here to search

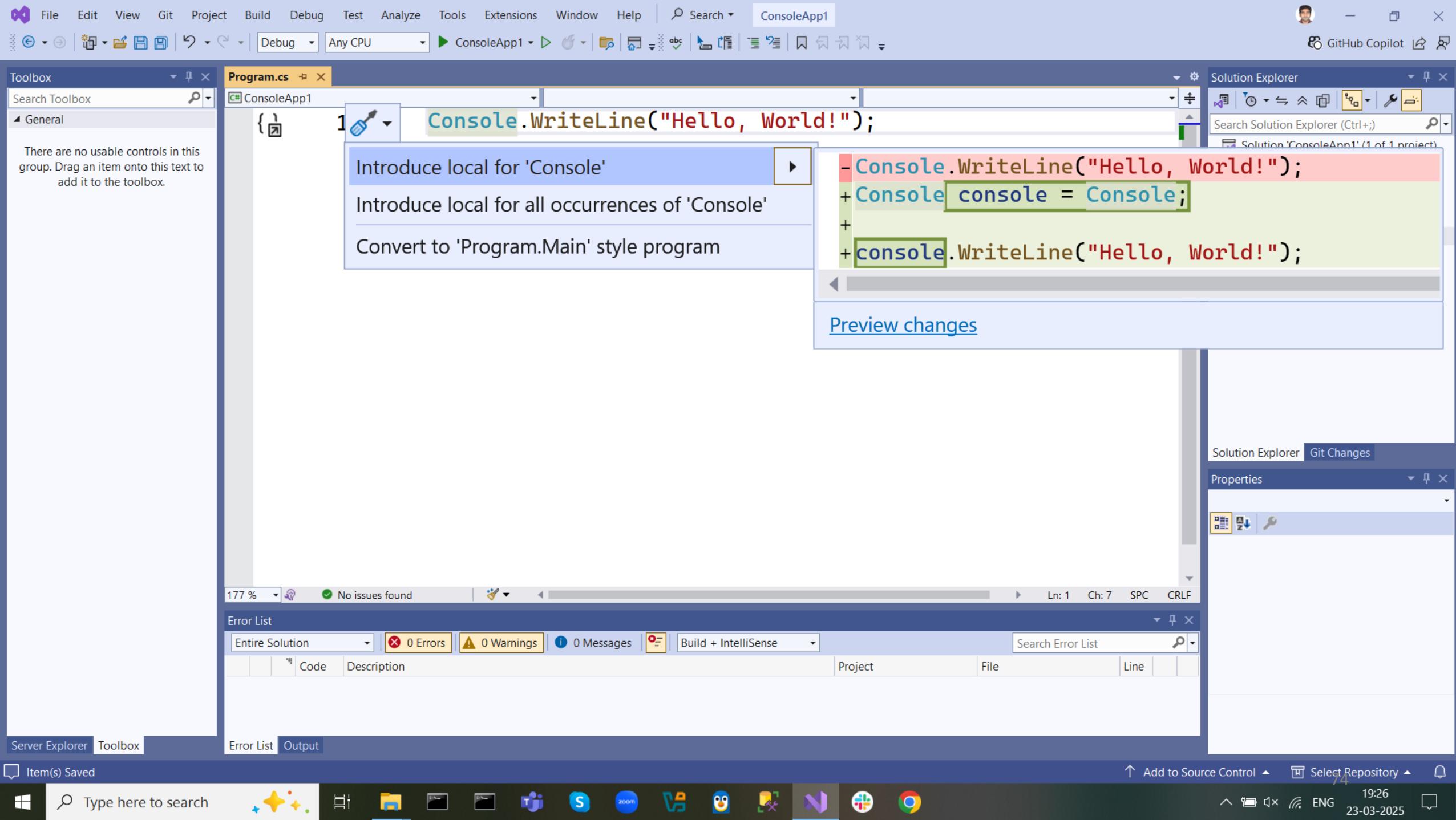
File Explorer Task List References Properties GitHub Copilot

GitHub Copilot

Solution Explorer

Solution Explorer Git Changes

Properties





Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
Console.WriteLine("Hello, World!");
```

1

Preview Changes

Introduce local for 'Console'

Changes

C# Program.cs

```
Console console = Console; ... console.WriteLine("Hello, World!");
```

Preview Code Changes:

```
1 Console console = Console;
2
3 console.WriteLine("Hello, World!");
```

Ln: 3 Ch: 36

Apply Cancel

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Search Error List

Code Description Project File Line

Error List Output

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Solution Explorer Git Changes

Properties

Toolbox  X

Search Toolbox  X

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs X

Console.WriteLine("Hello, World!");

1

Preview Changes

Introduce local for 'Console'

Changes C# Program.cs

Console console = Console; ... console.WriteLine("Hello, World!");

Preview Code Changes:

```
1 Console console = Console;
2
3 console.WriteLine("Hello, World!");
```

Ln: 3 Ch: 36

Apply Cancel

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Search Error List

Code Description Project File Line

Error List Output

Solution Explorer

Search Solution Explorer (Ctrl+;)  X

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
C# ConsoleApp1
1   Console.WriteLine("Hello, World!");
```

Global 'using' directives

177 % No issues found

Error List

Entire Solution	0 Errors	0 Warnings	0 Messages	Build + IntelliSense	Search Error List

Code Description Project File Line

Server Explorer Toolbox Error List Output

Solution Explorer

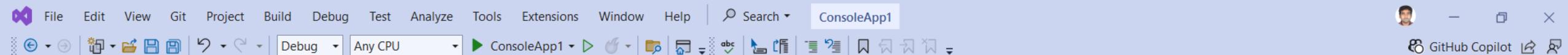
Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 Console.WriteLine("Hello, World!");
```

{ Directives from 'ConsoleApp1.GlobalUsings.g.cs'

- System
- System.Collections.Generic
- System.IO
- System.Linq
- System.Net.Http
- System.Threading
- System.Threading.Tasks

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Search Error List

Code Description Project File Line

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

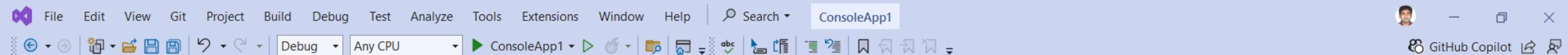
- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

Properties

Server Explorer

Error List Output





Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 Console.WriteLine("Hello, World!");
```

Directives from 'ConsoleApp1.GlobalUsings.g.cs'

- System
- System.Collections.Generic
- System.IO
- System.Linq
- System.Net.Http
- System.Threading
- System.Threading.Tasks

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Search Error List

Code Description Project File Line

Solution Explorer

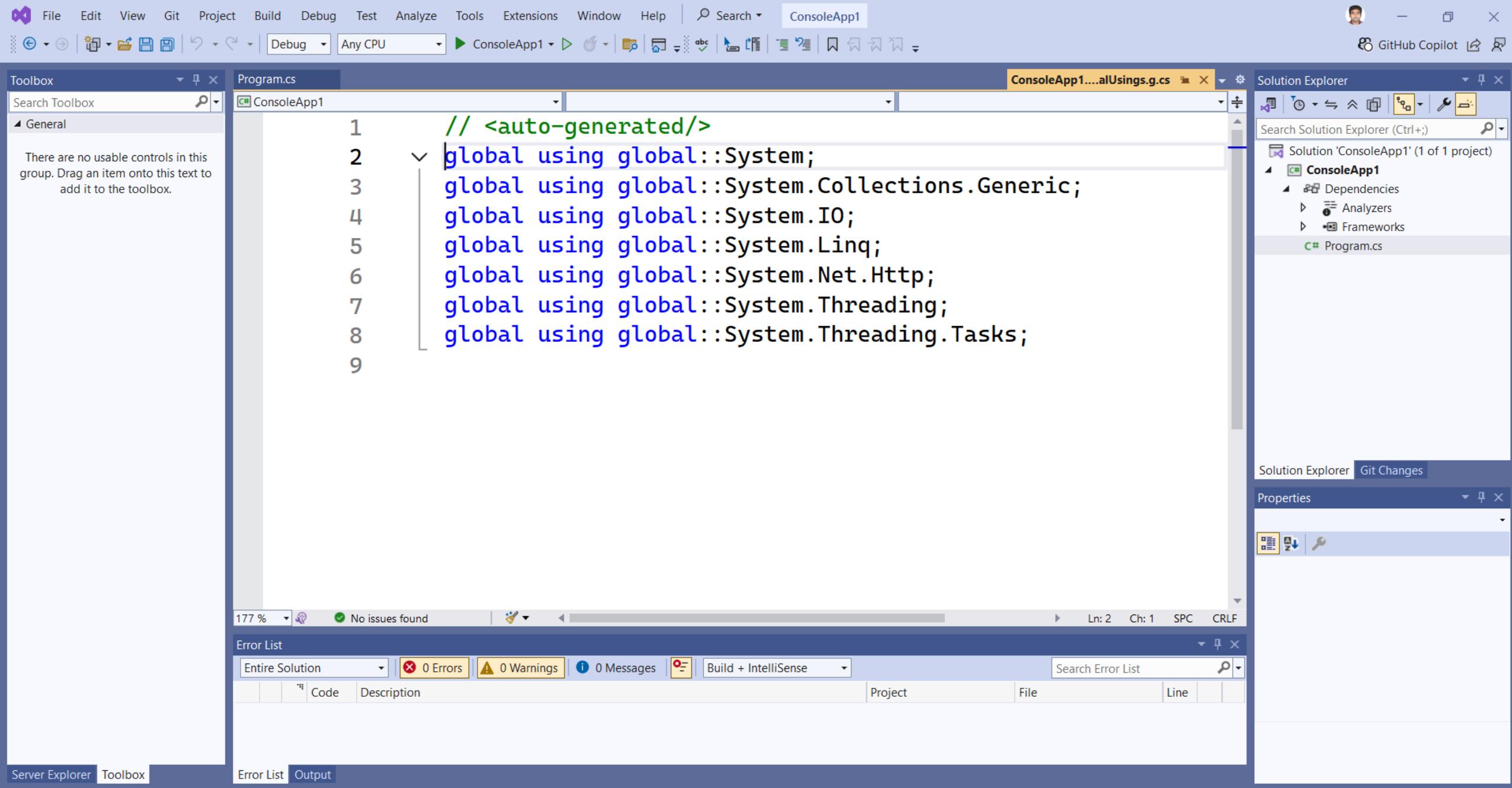
Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

Properties







Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
Console.WriteLine("Hello, World!");
```

Introduce local for 'Console'
Introduce local for all occurrences of 'Console'
Convert to 'Program.Main' style program

```
+ internal class Program
+ {
+     private static void Main(string[] args)
+     {
+         Console.WriteLine("Hello, World!");
+     }
+ }
```

Preview changes

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Code Description Project File Line

Solution Explorer

Properties

Git Changes

Server Explorer

Error List Output

Add to Source Control Select Repository



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
Console.WriteLine("Hello, World!");
```

Preview Changes

Convert to 'Program.Main' style program

Changes

C# Program.cs

internal class Program ... }

Preview Code Changes:

```
1 internal class Program
2 {
3     private static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

Apply Cancel

177 % No issues found

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense

Search Error List

Code Description Project File Line

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Solution Explorer Git Changes

Properties



Toolbox Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs* Any CPU | Debug | ConsoleApp1 | Program | Main(string[] args)

```
internal class Program
{
    private static void Main(string[] args)
    {
        Console.WriteLine("Hello, World!");
    }
}
```

177 % No issues found | Error List

Entire Solution | 0 Errors | 0 Warnings | 0 of 1 Message | Build + IntelliSense | Search Error List

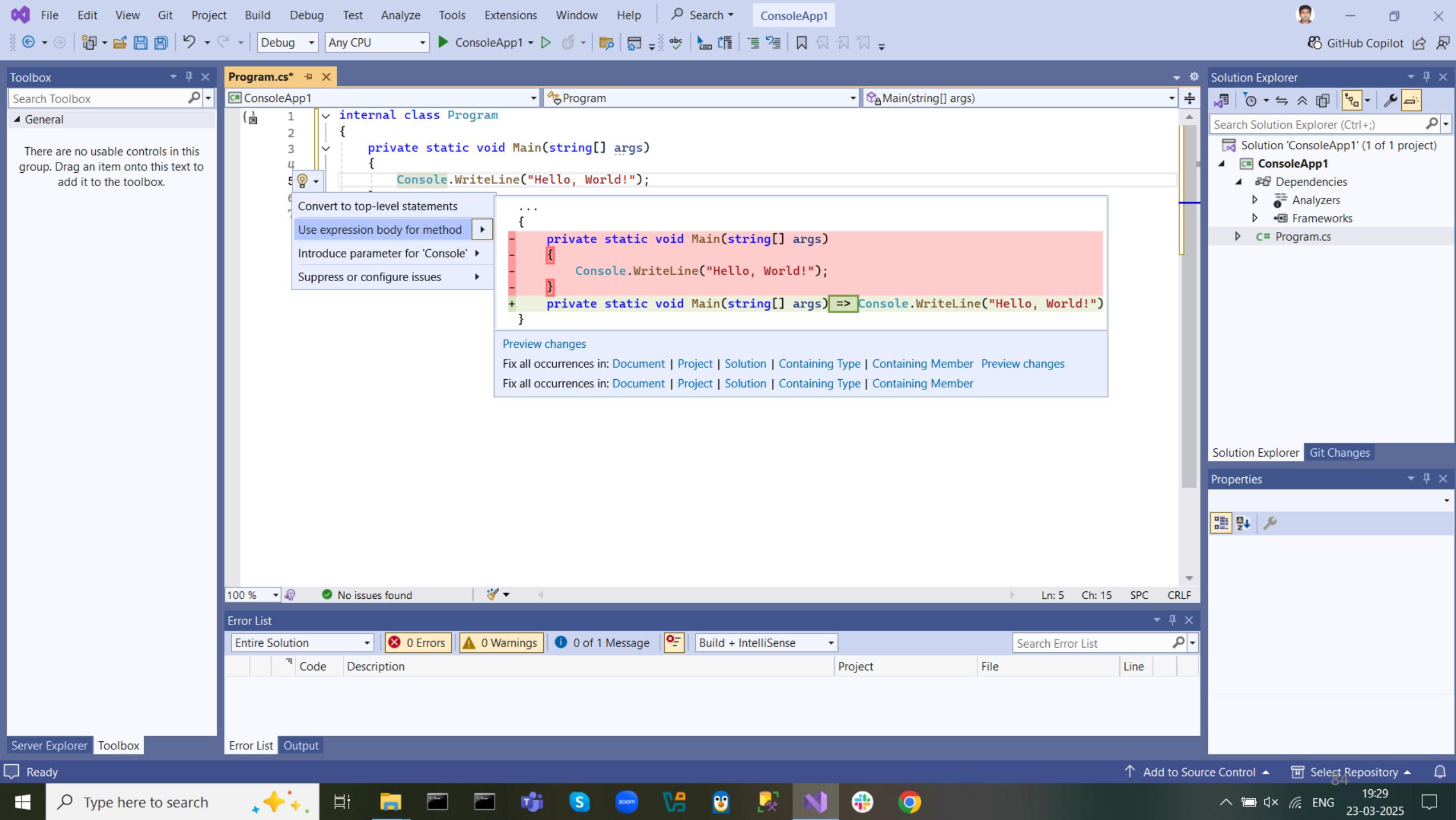
Code Description Project File Line

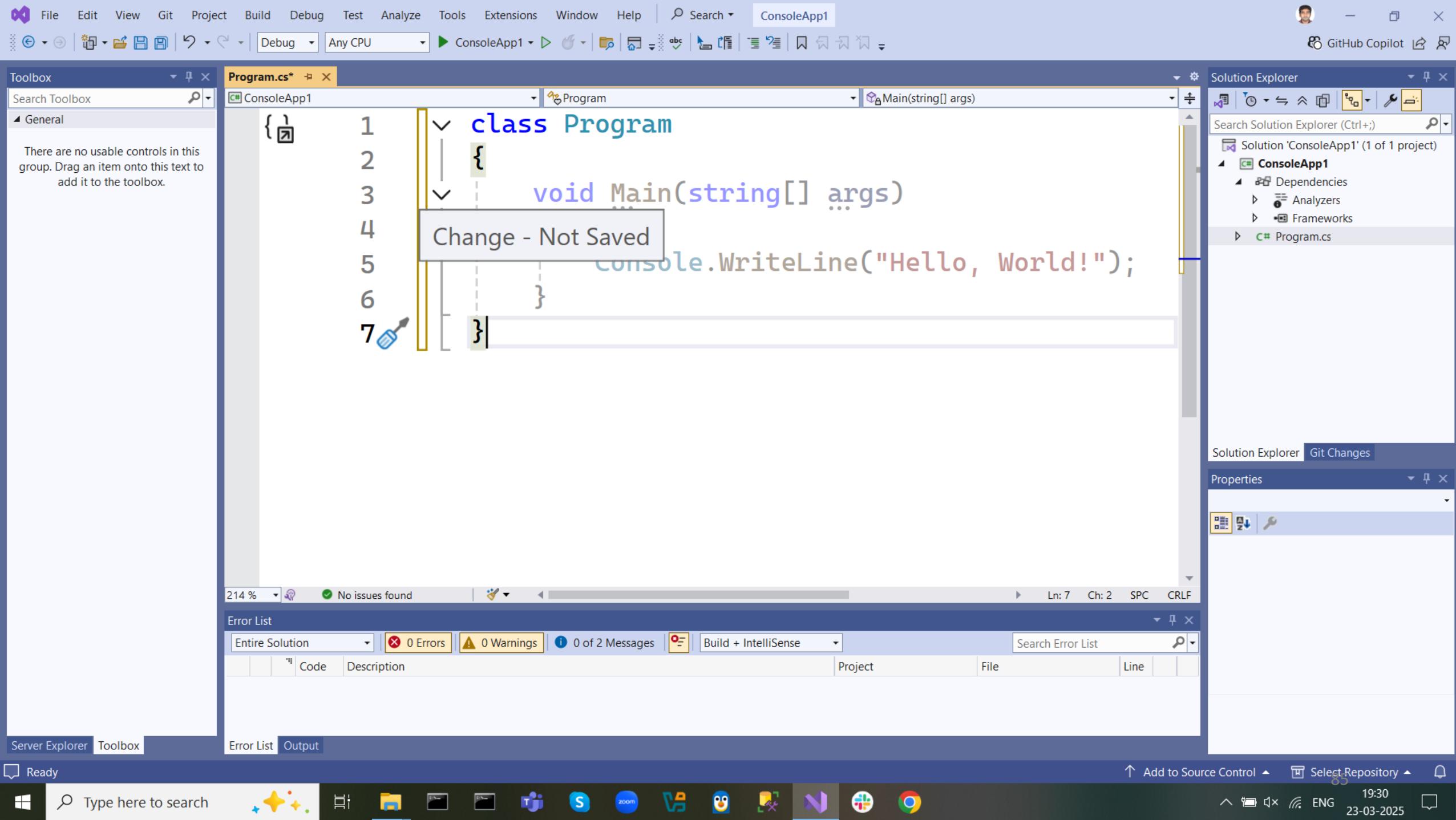
Solution Explorer | Git Changes

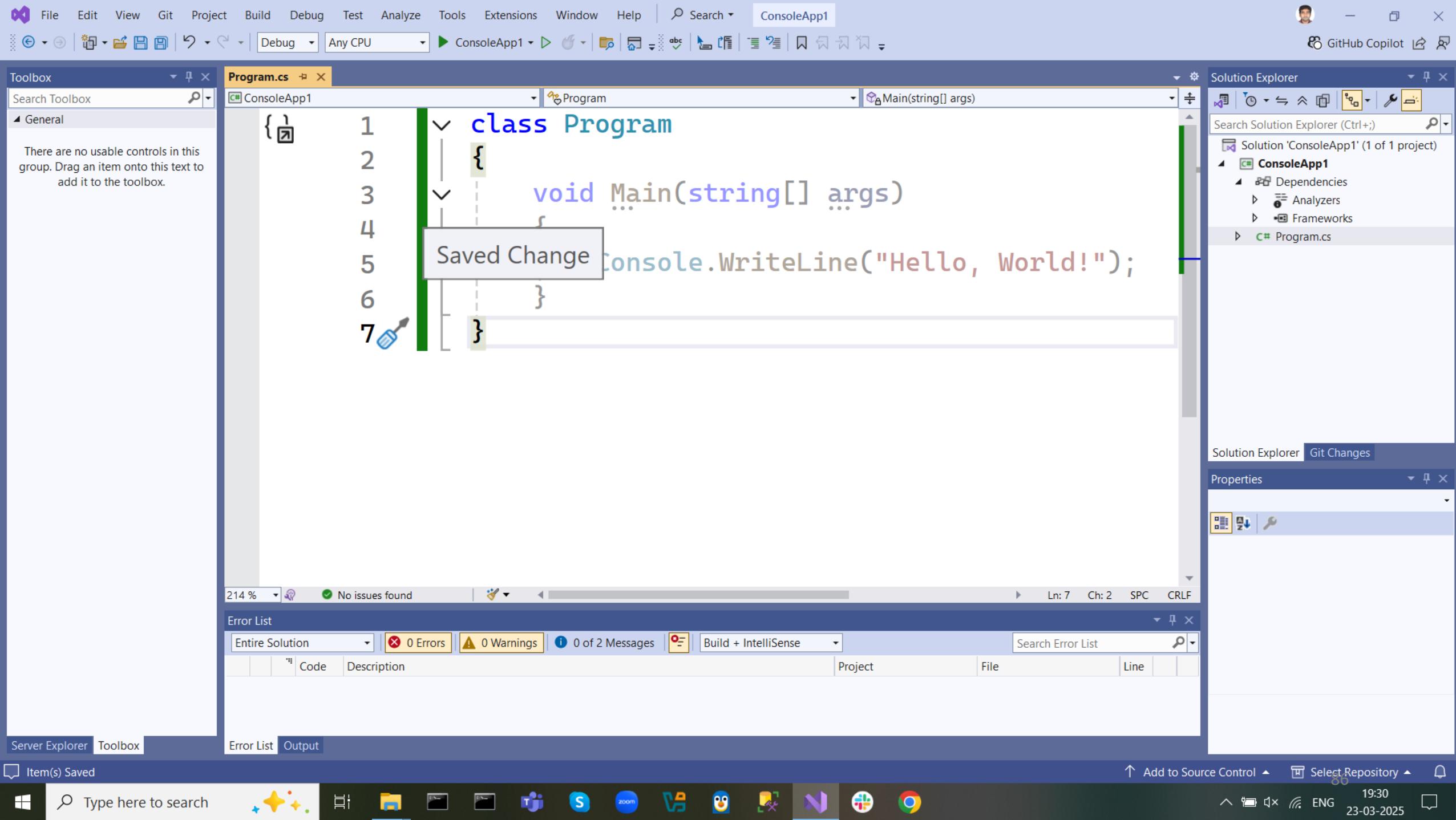
Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Properties









GitHub Copilot

Toolbox Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
ConsoleApp1 Program Main(string[] args)
```

1 class Program
2 {
3 void Main(string[] args){...}
4 }
5
6
7

214 % No issues found

Error List

Code	Description	Project	File	Line	
Entire Solution	0 Errors	0 Warnings	0 of 2 Messages	Build + IntelliSense	Search Error List

Solution Explorer

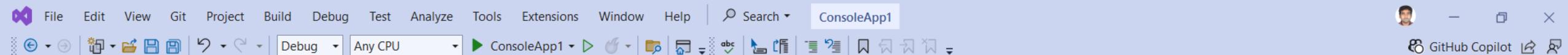
Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

ConsoleApp1

Program

Main(string[] args)

1 > class Program ...

214 %

No issues found

Error List

Entire Solution

0 Errors

0 Warnings

0 of 2 Messages

Build + IntelliSense

Search Error List

Code Description

Project File Line

Server Explorer

Toolbox

Error List

Output

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Solution Explorer

Git Changes

Properties

Item(s) Saved

Type here to search

Add to Source Control

Select Repository

19:30

ENG

23-03-2025





Toolbox

Search Toolbox

General

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Program.cs

ConsoleApp1

Program

Main(string[] args)

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

Microsoft Visual Studio Debug Console

```
Hello, World!

C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\
0 (0x0).
Press any key to close this window . . .
```

214 %

No issues found

Error List

Entire Solution

1 Error 0 Warning

	Code	Description
CS5001		Program does not contain a static 'Main' point

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         "Hello, World!";
6     }
7 }
```

CA1822: Member 'Main' does not access instance data and can be marked as static

Show potential fixes (A)

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



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Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.W
6     }
7 }
```

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Server Explorer

Error List

Output

Ready

Add to Source Control

Select Repository

Type here to search

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer

Properties

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello World!");
6     }
7 }
```

No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

IDE0060: Remove unused parameter 'args'

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Ready

Type here to search

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties

Toolbox ▾ X

Search Toolbox 

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs ▾ X

C# ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello World!");
6     }
7 }
```

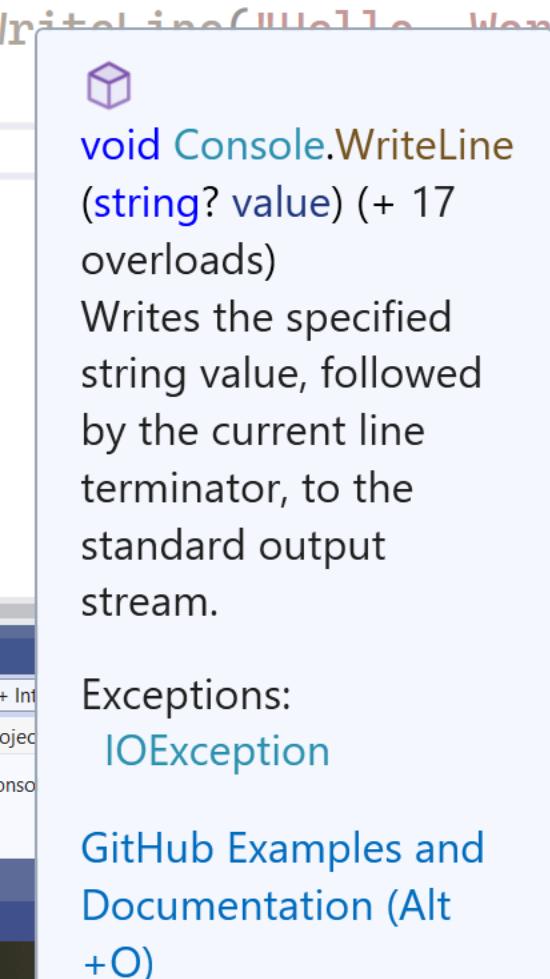
214%  No issues found 

Error List

Entire Solution	Code	Description
1 Error	CS5001	Program does not contain a static 'Main' method suitable for an entry point

Build + Intellisense  

Server Explorer  Toolbox  Error List  Output 



Exceptions:
[IOException](#)

[GitHub Examples and Documentation \(Alt +O\)](#)

Solution Explorer ▾ X

Search Solution Explorer (Ctrl+;) 

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer  Git Changes 

Properties 

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         ...
6     }
7 }
```

Add accessibility modifiers

Make static

Remove unused member

Suppress or configure issues ▶

Error List	
Entire Solution	
Code	Description
CS5001	Program does not contain a static 'Main' method suitable for an entry point

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
 - Program.cs

CA1822 Member 'Main' does not accept 'args'. Consider marking as static

```
- void Main(string[] args)
+ static void Main(string[] args)
```

Preview changes

Fix all occurrences in: Document | Project | Solution | Containing Member | Containing Type

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs* □ X

ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs* □ ×

ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

Change - Not Saved

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static Main method suitable for an entry point	ConsoleApp1	CSC	1	
CA1822	Member 'Main' does not access instance data and can be marked as static	ConsoleApp1	Program.cs	3	
IDE0060	Remove unused parameter 'args'	ConsoleApp1	Program.cs	3	

Error List Output

Solution Explorer

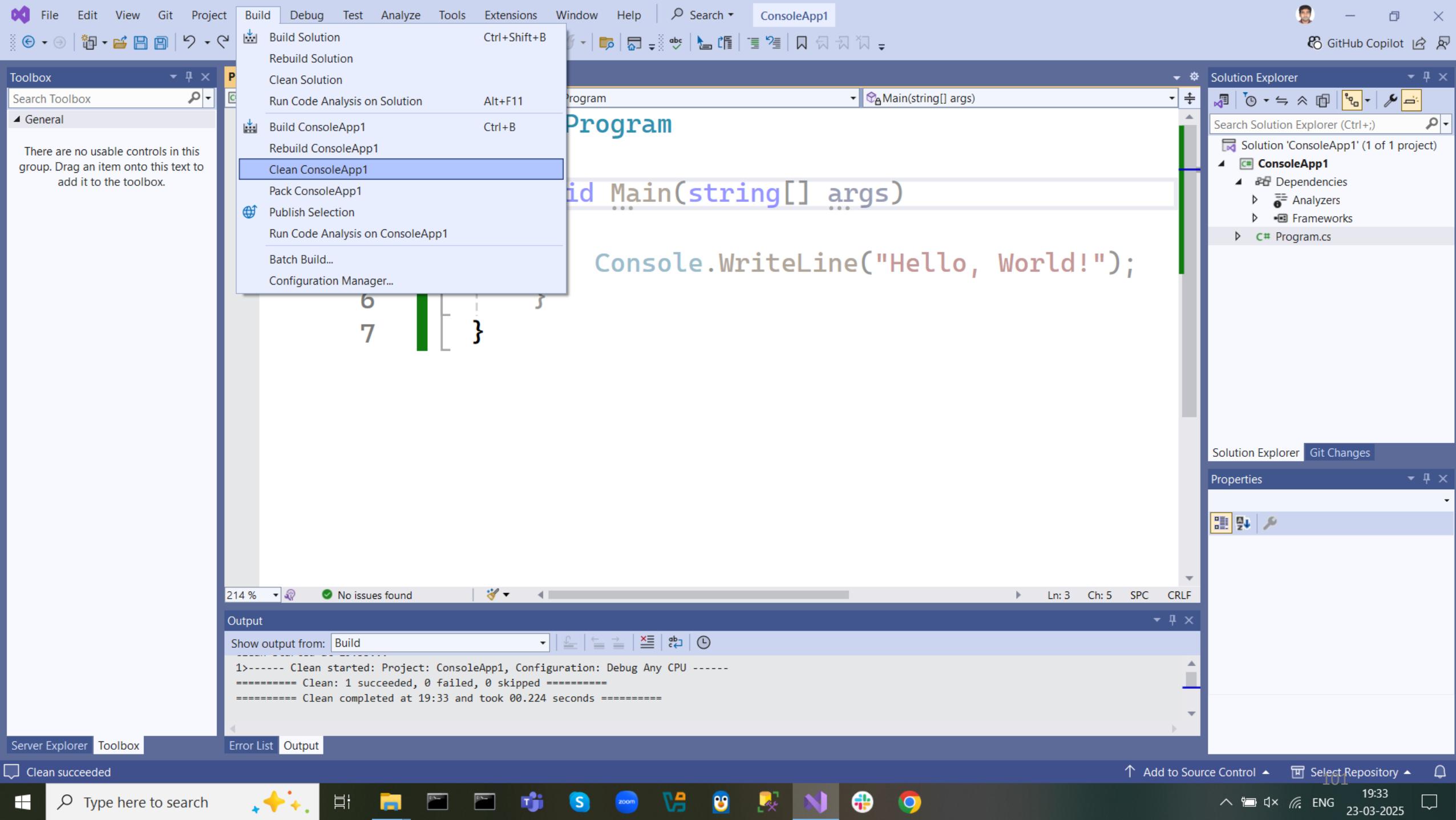
Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties



File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help Search ConsoleApp1 GitHub Copilot

Toolbox Search Toolbox General There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Build Solution Ctrl+Shift+B
Rebuild Solution
Clean Solution
Run Code Analysis on Solution Alt+F11
Build ConsoleApp1 Ctrl+B
Rebuild ConsoleApp1
Clean ConsoleApp1
Pack ConsoleApp1
Publish Selection
Run Code Analysis on ConsoleApp1
Batch Build...
Configuration Manager...

Program Main(string[] args)

```
public class Program
{
    static void Main(string[] args)
    {
        Console.WriteLine("Hello, World!");
    }
}
```

6 7 { }

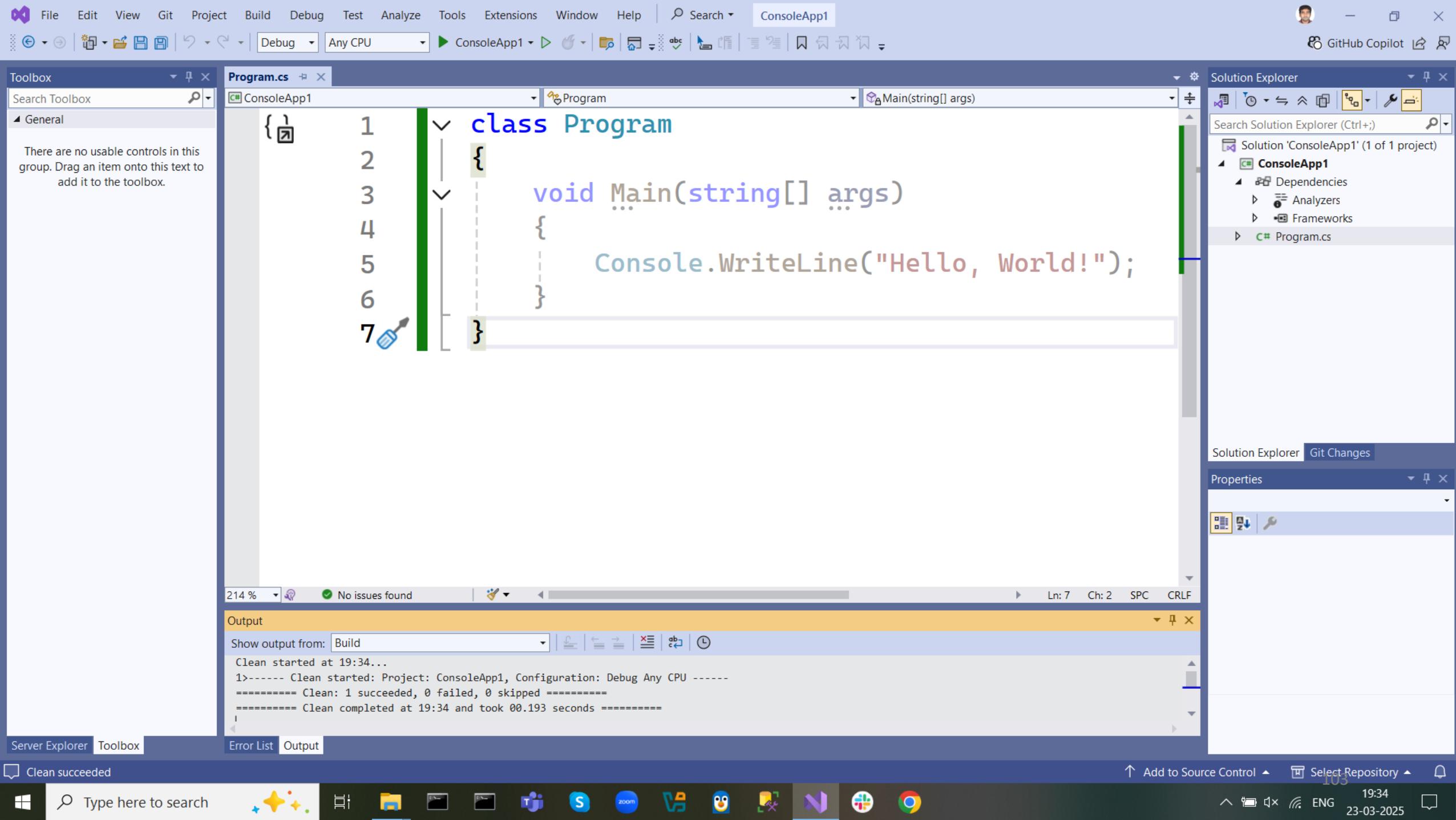
214 % No issues found Output Show output from: Build 1>----- Clean started: Project: ConsoleApp1, Configuration: Debug Any CPU -----
===== Clean: 1 succeeded, 0 failed, 0 skipped ====== Clean completed at 19:33 and took 00.224 seconds =====

Solution Explorer Solution 'ConsoleApp1' (1 of 1 project) ConsoleApp1 Dependencies Analyzers Frameworks C# Program.cs

Properties

Clean succeeded Add to Source Control Select Repository 102 19:34 23-03-2025 ENG

Type here to search





GitHub Copilot

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

ConsoleApp1

Program

Main(string[] args)

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 %

No issues found

Output

Show output from: Build

```
Clean started at 19:34...
1>----- Clean started: Project: ConsoleApp1, Configuration: Debug Any CPU -----
===== Clean: 1 succeeded, 0 failed, 0 skipped =====
===== Clean completed at 19:34 and took 00.193 seconds =====
```

Server Explorer

Error List

Output

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Analyzers

Frameworks

Program.cs

Solution Explorer

Git Changes

Properties

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

Microsoft Visual Studio

The debug executable 'C:\Users\shouvik\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.exe' specified in the 'ConsoleApp1' debug profile does not exist.

OK

214 % No issues found

Output

Show output from: Build

```
1>Done building project "ConsoleApp1.csproj" -- FAILED.
===== Build: 0 succeeded, 1 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 19:34 and took 00.426 seconds =====
```

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

```
1 class Program
2 {
3     void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

Quick Actions (Alt+Enter or Ctrl+.)

214 % No issues found

Error List

Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	
CA1822	Member 'Main' does not access instance data and can be marked as static	ConsoleApp1	Program.cs	3	

Solution Explorer

Search Solution Explorer (Ctrl+.)

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- Program.cs

Solution Explorer Git Changes

Properties

Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

ConsoleApp1 Program Main(string[] args)

1 class Program

2 {

3 void Main(string[] args)

4 Use expression body for method

5 Add accessibility modifiers

6 Change signature...

7 Extract base class...

8 Make static

9 Remove unused member

10 Suppress or configure issues

214 % No issues found

Error List

Entire Solution 1 Error 0 Warnings 2 Messages Build + IntelliSense

	Code	Description	Project
CS5001	Code	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1
CA1822	Code	Member 'Main' does not access instance data and can be marked as static	ConsoleApp1

Preview changes

Fix all occurrences in: Document | Project | Solution
Containing Member | Containing Type

Program.cs 3

Toolbox ▾ X

Search Toolbox 

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs ▾ X

C# ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214%  No issues found 

Error List

Entire Solution	Code	Description	Project	File	Line	Suppression State
CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC		1	
IDE0060	Remove unused parameter 'args'	ConsoleApp1	Program.cs		3	

Error List Output

Solution Explorer

Search Solution Explorer (Ctrl+;) 

Solution 'ConsoleApp1' (1 of 1 project)

- ConsoleApp1
 - Dependencies
 - Analyzers
 - Frameworks
- C# Program.cs

Solution Explorer Git Changes

Properties



Toolbox  X

Search Toolbox  General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs X Start Without Debugging (Ctrl+F5)

C# ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Error List

	Code	Description	Project	File	Line	Suppression State
✖	CS5001	Program does not contain a static 'Main' method suitable for an entry point	ConsoleApp1	CSC	1	
▷	IDE0060	Remove unused parameter 'args'	ConsoleApp1	Program.cs	3	

Entire Solution 1 Error 0 Warnings 1 Message Build + IntelliSense Search Error List

Server Explorer Toolbox

Error List Output

Item(s) Saved Add to Source Control Select Repository 109 19:35 23-03-2025 ENG

Solution Explorer

Search Solution Explorer (Ctrl+;) C# Solution 'ConsoleApp1' (1 of 1 project) ConsoleApp1 Dependencies Analyzers Frameworks C# Program.cs

Solution Explorer Git Changes Properties



Toolbox  X

Search Toolbox 

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs  X

C# ConsoleApp1 Program Main(string[] args)

```
1 class Program
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
}
```

Microsoft Visual Studio Debug Console

```
Hello, World!

C:\Users\shouvik\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.exe (process 5152) exited 0 (0x0).
Press any key to close this window . . .
```

214 %

Output

Show output

1>ConsoleApp1

=====

=====

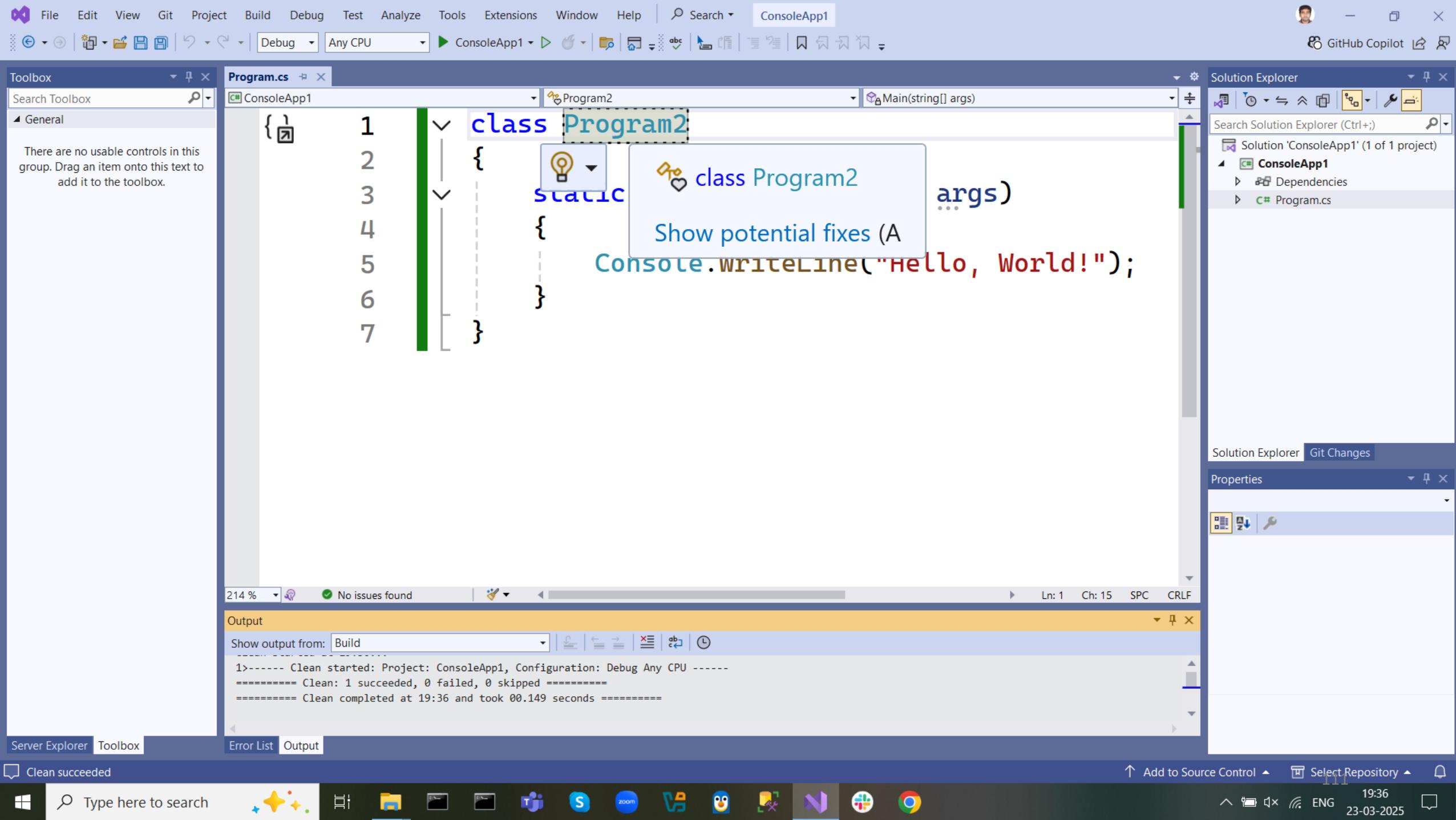
Server Explorer  Toolbox  Error List 

Build succeeded

Type here to search 

110

19:35 23-03-2025 ENG



Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

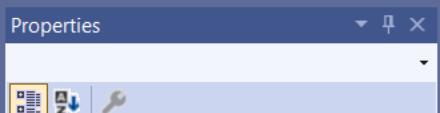
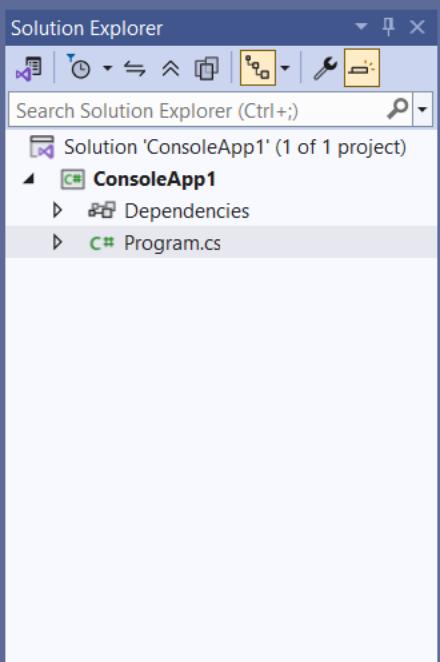
Program.cs

```
1 class Program2
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

214 % No issues found

Output

```
Show output from: Build
1>ConsoleApp1 -> C:\Users\shouwick\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.dll
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 19:37 and took 00.414 seconds =====
```





Toolbox

Search Toolbox

General

There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.

Program.cs

ConsoleApp1

Program

Main(string[] args)

```
1 class Program
2 {
3     static void Main(string[] args)
4     {
5         Console.WriteLine("Hello, World!");
6     }
7 }
```

Microsoft Visual Studio Debug Console

```
Hello, World!

C:\Users\shouvik\Desktop\IITGN\playground\ConsoleApp1\bin\Debug\net8.0\ConsoleApp1.exe (process 16016) exited with code
0 (0x0).
Press any key to close this window . . .
```

Output

Show output from:

```
1>ConsoleApp1 ->
===== Build: 0 succeeded, 0 failed, 0 up-to-date, 0 skipped
===== Build: 0 succeeded, 0 failed, 0 up-to-date, 0 skipped
```

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'ConsoleApp1' (1 of 1 project)

ConsoleApp1

Dependencies

Program.cs

Solution Explorer Git Changes

Properties

Texts, References, and Acknowledgements

Textbook:

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Reference:

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- Yusuf Sulistyo Nugroho, Hideaki Hata, and Kenichi Matsumoto. 2020. *How different are different diff algorithms in Git? Use --histogram for code changes*. Empirical Softw. Engg. 25, 1 (Jan 2020), 790–823.