

Visual Studio 2019

Code faster, smarter

Money Yu



It's sunny in Seattle.

What's today's weather?

How cold is it?

What's the weather like in Seattle?

intent = weather
place = seattle, wa
date = May 3 2017, 8am

Do I need my umbrella?

講師介紹

- 微軟最有價值專家
 - 2017-至今
- abc12207@gmail.com
- 資策會講師
- 研討會講師
 - Microsoft Ignite | The Tour: Singapore
 - 2018 .NET Conf 台中場
 - Microsoft Azure Tech Salon 台北場
 - Microsoft Insider Dev Tour 台北場
 - Etc.



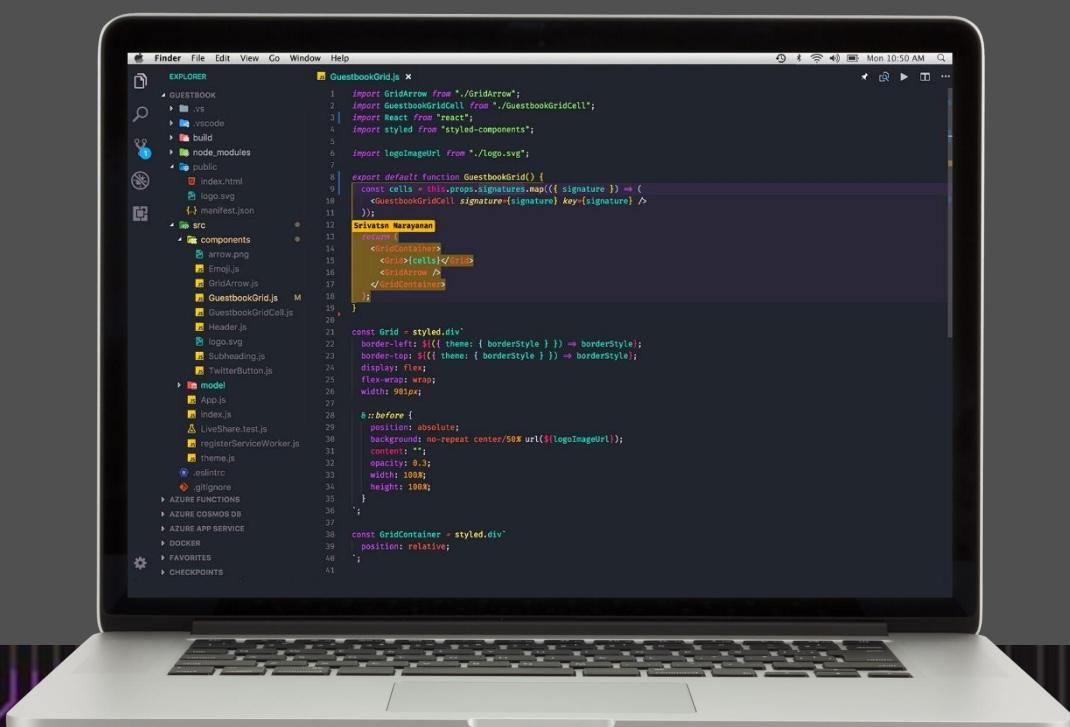
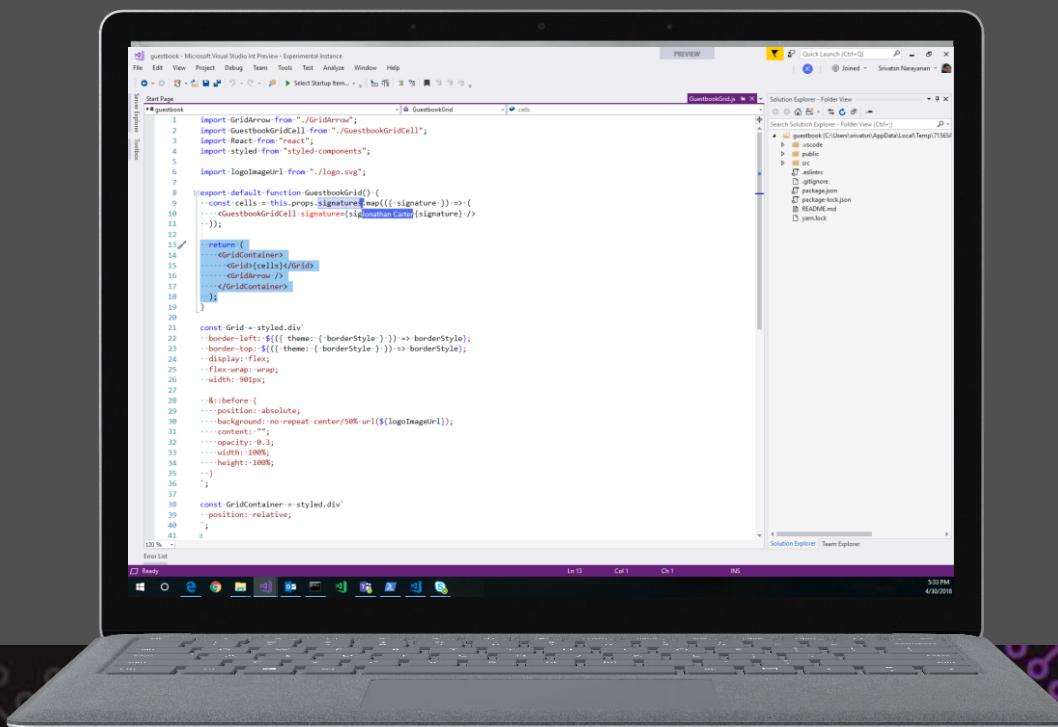
Top Dev Tools measured by Stack Overflow survey

#1 Visual Studio Code

50.7%

#2 Visual Studio

31.5%



C#

Visual Studio

Azure App Service

Node.js

Azure Linux VM

Visual Studio
for Mac

C++

Azure
Kubernetes
Service

Visual Studio
Code

Python

Azure Web Apps

Vim

Your tools
Your languages
Your apps

Vim

Python

Azure
Kubernetes
Service

Visual Studio

ASP.NET

Azure Web
AppsVisual Studio
for Mac

Node.js

iOS

Your tools**Your languages****Your apps**

Visual Studio
for Mac

ASP.NET

Azure
Kubernetes
Service

Visual Studio
Code

Node.js

Azure Web
Apps

Vim

C++

iOS

Azure Linux

Your tools

Your languages

Your apps



Service

Visual Studio

Python

Azure Web Apps

Visual Studio
for Mac

C#

iOS

Visual Studio
Code

Node.js

Azure Linux
VM

Azure

Your tools

Your languages

Your apps



Visual Studio
Code

C++

iOS

Vim

Python

Azure Linux
VM

Visual Studio

C#

Azure
Kubernetes
Service

Visual Studio

Azure Web

Your tools

Your languages

Your apps



RELEASED

.NET Core 3.0

WPF and Windows Forms support

Side-by-side support & self-contained EXEs

Full-stack web development with C# and Razor

New C# 8.0 language features



dot.net/get-core3

RELEASED

Visual Studio 2019 version 16.3

Visual Studio 2019 for Mac version 8.3

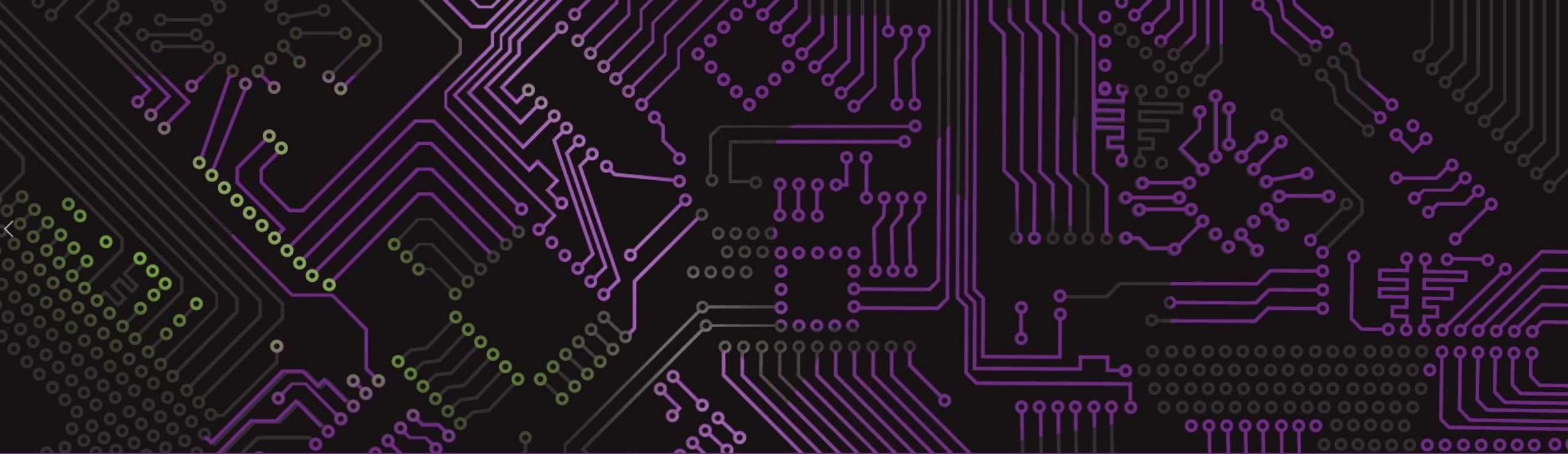
Support for .NET Core 3.0 and C# 8.0

New .NET productivity improvements

More performance improvements

iOS 13 & Android 10 support

visualstudio.com/downloads



VS 2019 可以和 VS 2017 共存

VS 2019 也可以和 VS 2019 Preview 共存

SmartHotel.Clients.iOS > Debug > iPhone XS Max iOS 12.1

Visual Studio Enterprise 2019 for Mac

Press 'Esc' to search

Solution

- Suggestion
- Utils
- Validations
- ViewModels
 - Base
 - BookingCalendarViewModel.cs
 - BookingHotelsViewModel.cs
 - BookingHotelViewModel.cs
 - BookingViewModel.cs
 - CheckoutViewModel.cs
 - ExtendedSplashViewModel.cs
 - HomeViewModel.cs
 - LoginViewModel.cs
 - MainViewModel.cs
 - MenuViewModel.cs
 - MyRoomViewModel.cs
 - NotificationsViewModel.cs
 - OpenDoorViewModel.cs
 - SettingsViewModel.cs
 - SuggestionsViewModel.cs
- Views
 - BookingCalendarView.xaml
 - BookingHotelsView.xaml
 - BookingHotelView.xaml
 - BookingView.xaml
 - CheckoutView.xaml
 - CustomNavigationPage.xaml
 - ExtendedSplashView.xaml
 - HomeView.xaml
 - LoginView.xaml
 - MainView.xaml
 - MenuView.xaml
 - MyRoomView.xaml
 - NotificationsView.xaml
 - OpenDoorView.xaml

CheckoutViewModel.cs

NotificationsViewModel.cs

```
public ObservableRangeCollection<Models.Notification> Notifications {  
    get => notifications;  
    set => SetProperty(ref notifications, value);  
}  
  
public bool HasItems {  
    get => hasItems;  
    set => SetProperty(ref hasItems, value);  
}  
  
public ICommand DeleteNotificationCommand {<span style="color: blue;>get => new Command<Models.Notification>(n-</span>}  
  
public override Task InitializeAsync(object navigationData) {<span style="color: blue;>return base.InitializeAsync(navi-</span>  
    if (navigationData != null) {<span style="color: blue;>  
        Notifications = (ObservableRangeCollection<Models.Notification>)navigationData;  
        HasItems = Notifications.Count > 0;  
    }</span>  
    return Task.CompletedTask;  
}  
  
(parameter) object navigationData;
```

Source Changes Authors Log Merge

Breakpoints Locals Watch Threads

Name

/Volumes/Data/Repos/Microsoft/SmartHotel360-Mobile/Source/SmartHotel.Clients/SmartHotel.Clien

1:32

smarthotel 360

Username

Username

Password

Forgot Password?

SIGN IN

or

SIGN IN WITH MICROSOFT ACCOUNT

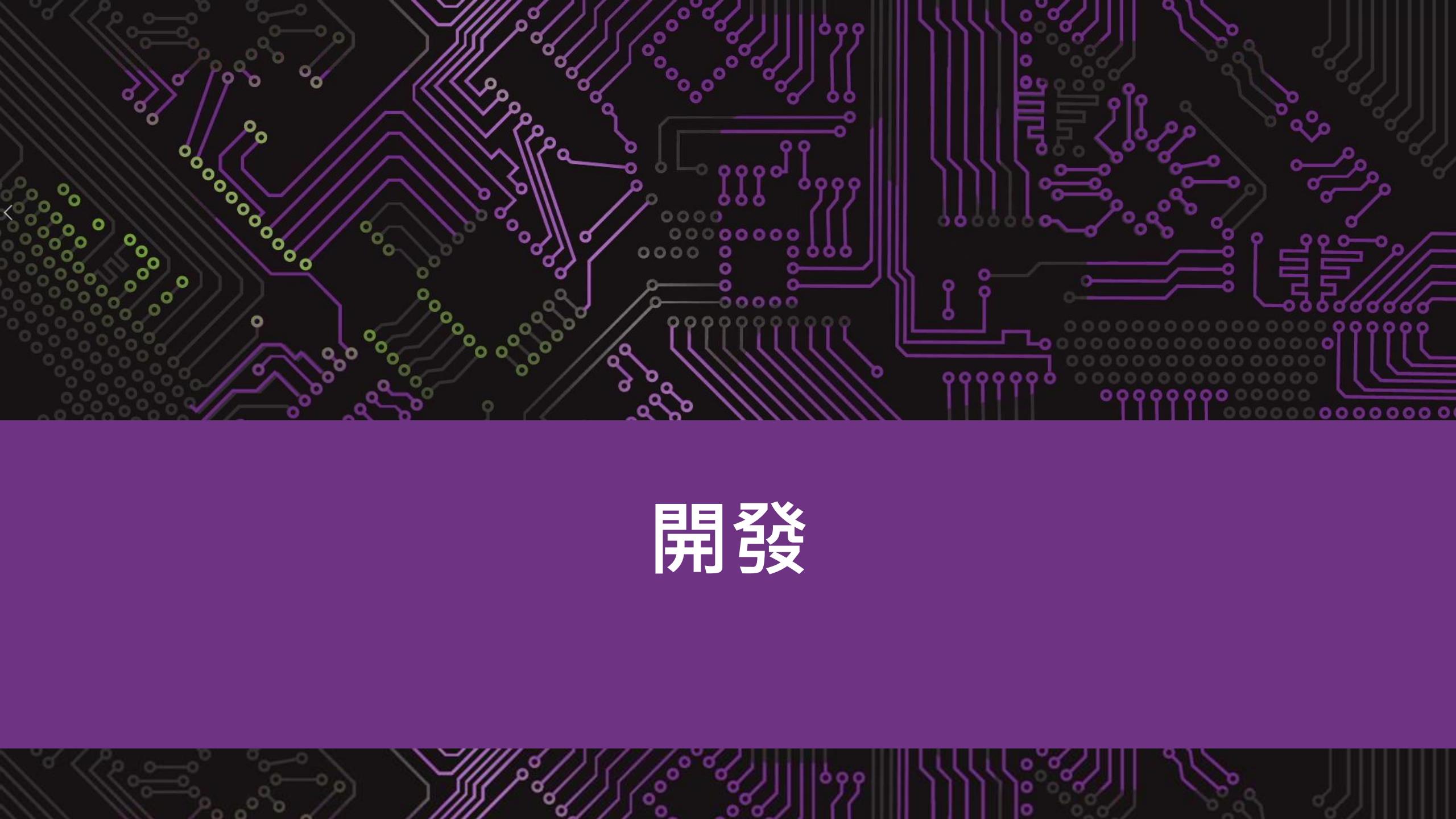
Don't have an account? [Sign up](#)

Properties Document Outline

Toolbox

Visual Studio for Mac

Unity .NET Core .NET Core Xamarin



開發

全新啟動介面

Create a new project

Recent project templates

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

Search bar: 🔍

Filter buttons: Language ▾, Platform ▾, Project type ▾

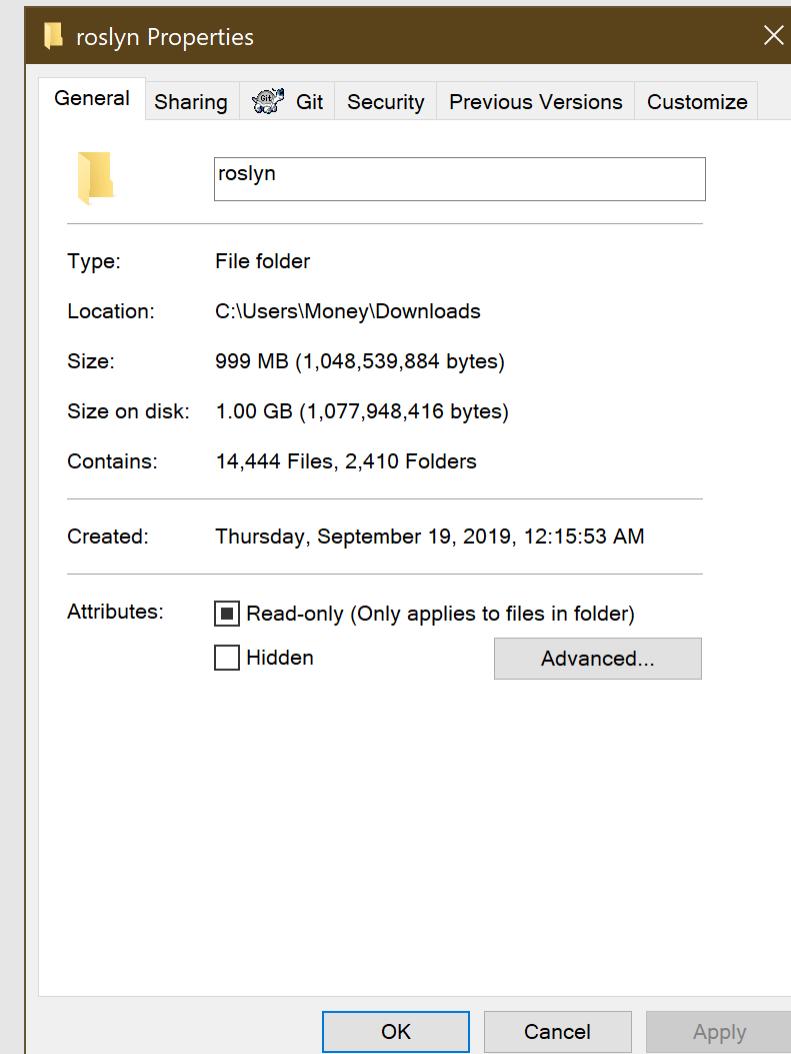
 Console App (.NET Core) A project for creating a command-line application that can run on .NET Core on Windows, Linux and MacOS. C# Linux macOS Windows Console
 ASP.NET Core Web Application Project templates for creating ASP.NET Core applications for Windows, Linux and macOS using .NET Core or .NET Framework. Create Razor Pages, MVC, Web API, and Single Page (SPA) Applications. C# Windows Linux macOS Web
 WPF App (.NET Framework) Windows Presentation Foundation client application C# Windows Desktop
 Class Library (.NET Standard) A project for creating a class library that targets .NET Standard. C# Android iOS Linux macOS Windows Library
 Azure Functions A template to create an Azure Function project. C# Azure Cloud
 Blank Solution Create an empty solution containing no projects

Next

全新的速度

<https://github.com/dotnet/roslyn>

Name	Date modified	Type	Size
.git	9/19/2019 12:18 AM	File folder	
.github	9/19/2019 12:17 AM	File folder	
docs	9/19/2019 12:17 AM	File folder	
eng	9/19/2019 12:17 AM	File folder	
scripts	9/19/2019 12:17 AM	File folder	
src	9/19/2019 12:18 AM	File folder	
.editorconfig	9/19/2019 12:17 AM	EDITORCONFIG File	9 KB
.gitattributes	9/19/2019 12:17 AM	GITATTRIBUTES File	3 KB
.gitignore	9/19/2019 12:17 AM	GITIGNORE File	3 KB
.vsconfig	9/19/2019 12:17 AM	VSCONFIG File	1 KB
azure-pipelines.yml	9/19/2019 12:17 AM	YML File	8 KB
azure-pipelines-integration.yml	9/19/2019 12:17 AM	YML File	3 KB
azure-pipelines-official.yml	9/19/2019 12:17 AM	YML File	11 KB
Build.cmd	9/19/2019 12:17 AM	Windows Command ...	1 KB
build.sh	9/19/2019 12:17 AM	Shell Script	1 KB
Compilers.sln	9/19/2019 12:17 AM	Microsoft Visual Stud...	46 KB
Compilers.slnf	9/19/2019 12:17 AM	Microsoft Visual Stud...	5 KB
CONTRIBUTING.md	9/19/2019 12:17 AM	MD File	5 KB
Directory.Build.props	9/19/2019 12:17 AM	Project Property File	1 KB
Directory.Build.rsp	9/19/2019 12:17 AM	RSP File	1 KB
Directory.Build.targets	9/19/2019 12:17 AM	TARGETS File	1 KB
dotnet-tools.json	9/19/2019 12:17 AM	Adobe After Effects J...	1 KB
global.json	9/19/2019 12:17 AM	Adobe After Effects J...	1 KB



全新的速度

Projects loaded and ready to use

 Task completed successfully



Loading IntelliSense

Loading 67/68: Roslyn.Test.Utilities.csproj

更彩色的顏色

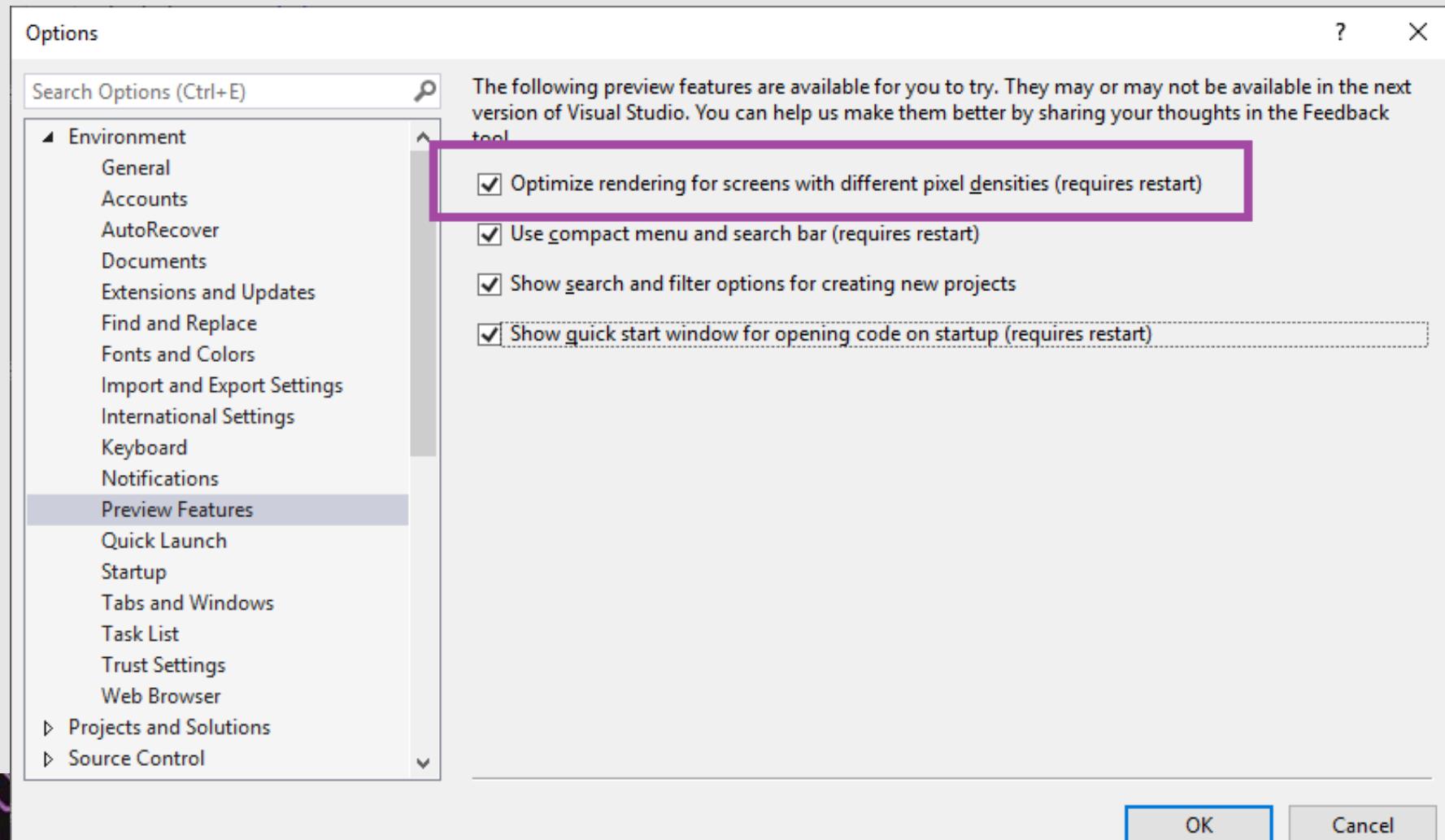
```
public void NewColors(Update160P2 parameterNewColor)
{
    var localVariableNewColor = 100;

    // for keyword has new color
    for (int i = 0; i < 10; i++)
    {
        localVariableNewColor--;
        parameterNewColor--;
    }
}

1 reference | 0 changes | 0 authors, 0 changes
public static Update160P2 operator --(Update160P2 x)
{
    return x;
}
```

Per Monitor Aware Rendering

- 高解析度螢幕救星



The image shows two identical instances of the Microsoft Visual Studio IDE running side-by-side. Both instances have the following interface elements:

- Top Bar:** Standard Windows-style menu bar with File, Edit, View, Project, Build, Debug, Tools, Test, Analyze, and Extension.
- Toolbar:** Includes icons for Back, Forward, Stop, Refresh, and various project-related tools.
- Code Editor:** Displays the same C# code for the `App.xaml.cs` file of a WPF application named `WpfApp4`. The code includes standard namespaces and a partial class definition for `App`.
- Toolbars:** Server Explorer and Toolbox are visible on the left side of each instance.
- Status Bar:** Shows "Ready" in the bottom-left and bottom-right corners, along with line numbers (Ln 18, Ln 5) and column numbers (Col 1, Col 19, Ch 19).

The main difference between the two instances is the output window content:

- Left Instance Output Window:** Set to "Xamarin Diagnostics". It shows log entries related to validating Android NDK locations.
- Right Instance Output Window:** Set to "Source Control - Git". It shows the message "Opening repositories:" followed by the path `C:\Users\rurrios\Source\Repos\WpfApp4`.

Editor Config



一種檔案格式，被廣泛使用於制定一致的編碼樣式供開發團隊使用

EditorConfig is awesome: <https://EditorConfig.org>

top-most EditorConfig file
root = true

Unix-style newlines with a newline ending every file
[*]
end_of_line = lf
insert_final_newline = true

Live Unit Testing



Microsoft Visual Studio

File Edit View Project Debug Team Tools Architecture Test Analyze Window

Test Explorer HomeIndexTests.cs

Streaming Video: Improving quality with unit tests and fakes

Run All | Run... | Playlist : All Tests

Passed Tests (1)

HomeIndexTests

23 ms

using System;
using System.Collections.Generic;
using System.Text;
using System.Web;
using System.Web.Mvc;
using HelloWorld;
using HelloWorld.Controllers;
using Microsoft.VisualStudio.TestPlatform.TestHost;

IntelliCode

Visual Studio IntelliCode

AI-assisted development

[Sign up for news and updates >](#)

Code with confidence



Find issues faster

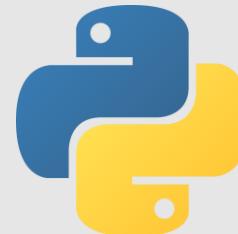


Focused code reviews



IntelliCode

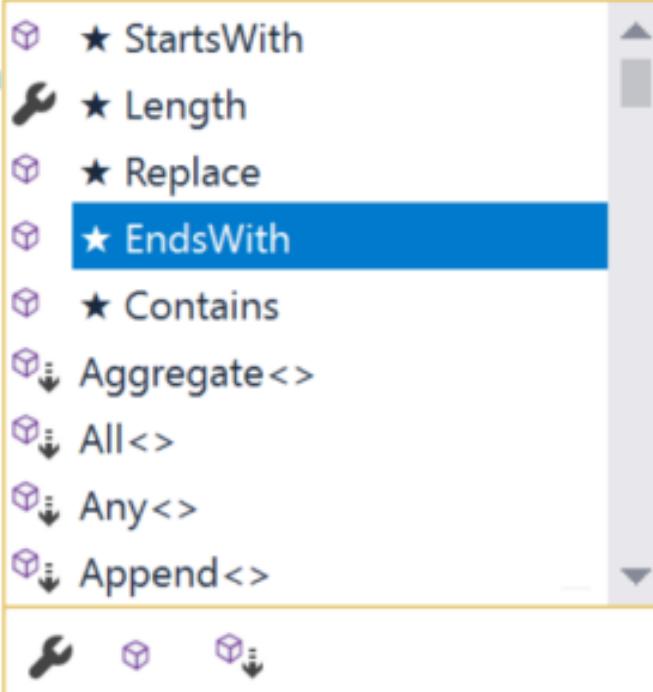
- C#
- C++
- Java
- Python
- TypeScript/JavaScript
- XAML



IntelliCode

```
private static string NormalizePath(string path)
{
    path = path.Replace('\\', '/');

    if (path.)
        return pa
}
```



bool string.EndsWith(string value)

(+3 overloads)

Determines whether the end of this string inst...

★ IntelliCode suggestion based on this context

DEMO

EditorConfig + Live Unit Testing + IntelliCode



IntelliCode

- 根據你的程式碼，自動推薦 Types
 - Preview - C#
- 參數自動完成
 - Preview
- 自動調整程式碼樣式以及格式化樣式
 - Preview



C#

.NET



C# 8.0



Safe

Nullable and non-nullable reference types help you write safer code

Declare your intent more clearly



Modern

Async streams for modern workloads like cloud & IoT communication

Easily work with cloud scale datasets using indexes and ranges



Productive

Write less code using patterns
Protect data with readonly members

Improved using statements for resource management

Server Error in '/' Application.

Object reference not set to an instance of an object.

Description: An unhandled exception occurred during the execution of the current web request. Please review the stack trace for more information about the error and where it originated in the code.

Exception Details: System.NullReferenceException: Object reference not set to an instance of an object.

Source Error:

```
Line 64:  
Line 65:             if (Page.IsValid)  
Line 66:             {  
Line 67:                 DateTime exhibitDate = DateTime.Now;  
Line 68:                 int caseid = Convert.ToInt32(DropDownListcaseid.SelectedItem.Text);
```

Source File: C:\Users\Selase\documents\visual studio 2010\Projects\Prototype5\Prototype5\AddExhibit.aspx.cs **Line:** 66

Stack Trace:

```
[NullReferenceException: Object reference not set to an instance of an object.]  
    Prototype5.AddExhibit.addExhibitButton_Click(Object sender, EventArgs e) in C:\Users\Selase\documents\visual studio 2010\Pro  
    System.Web.UI.WebControls.Button.OnClick(EventArgs e) +118  
    System.Web.UI.WebControls.Button.RaisePostBackEvent(String eventArgument) +112  
    System.Web.UI.WebControls.Button.System.Web.UI.IPostBackEventHandler.RaisePostBackEvent(String eventArgument) +10  
    System.Web.UI.Page.RaisePostBackEvent(IPostBackEventHandler sourceControl, String eventArgument) +13  
    System.Web.UI.Page.RaisePostBackEvent(NameValueCollection postData) +36  
    System.Web.UI.Page.ProcessRequestMain(Boolean includeStagesBeforeAsyncPoint, Boolean includeStagesAfterAsyncPoint) +5563
```

Library authors

“Nullable adoption phase”

- Try to get “nullified” before .NET 5

Consider multi-targeting

- .NET Core 3.0 for nullable annotations
- .NET Standard 2.0 for reach
- Manually opt in to C# 8.0 (*not supported*)

Ranges - C# 8.0

- This feature is about delivering two new operators (Index operator '^' and range operator '..') that allow constructing System.Index and System.Range objects and using them to index or slice collections at runtime.

```
var lastItem = array[^1];
```

```
var lastItem = array[collection.Count-1];
```

Ranges – C#8.0

Consider the following array:

```
var array = new int[] {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
```

Value	0	1	2	3	4	5	6	7	8	9	10
-------	---	---	---	---	---	---	---	---	---	---	----

We can access the array values with the following indexes:

Index	0	1	2	3	4	5	6	7	8	9	10
-------	---	---	---	---	---	---	---	---	---	---	----

Now we cut a slice view from this array as below:

```
var slice= array[2..5];
```

Value	2	3	4
-------	---	---	---

We can access the slice values with the following indexes:

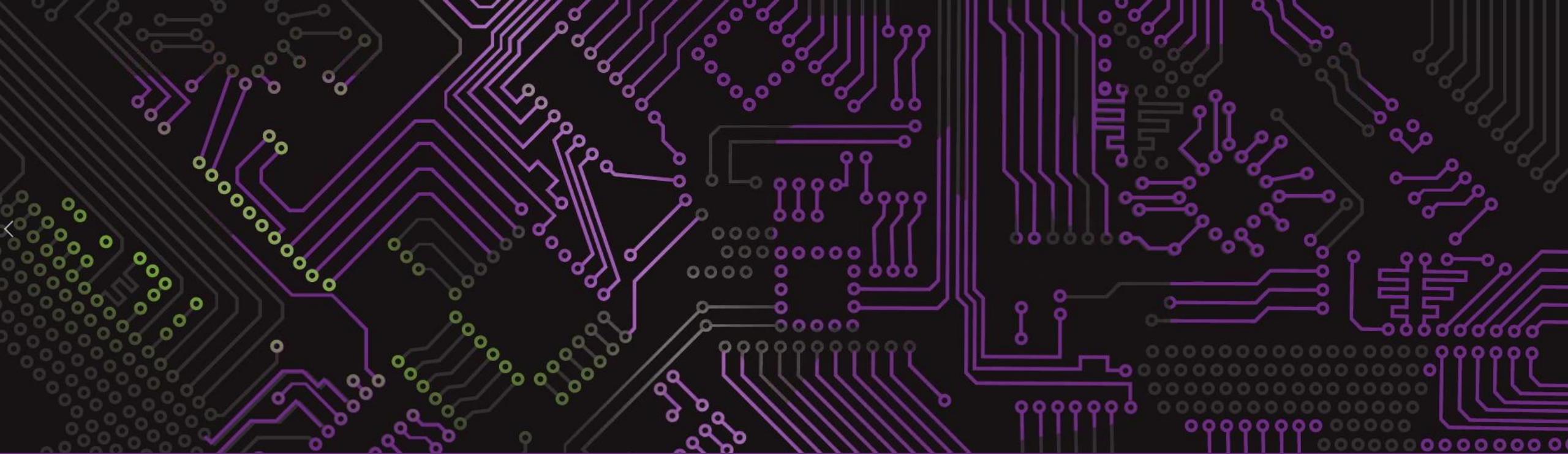
Index	0	1	2
-------	---	---	---

DEMO

C# 8.0

.NET





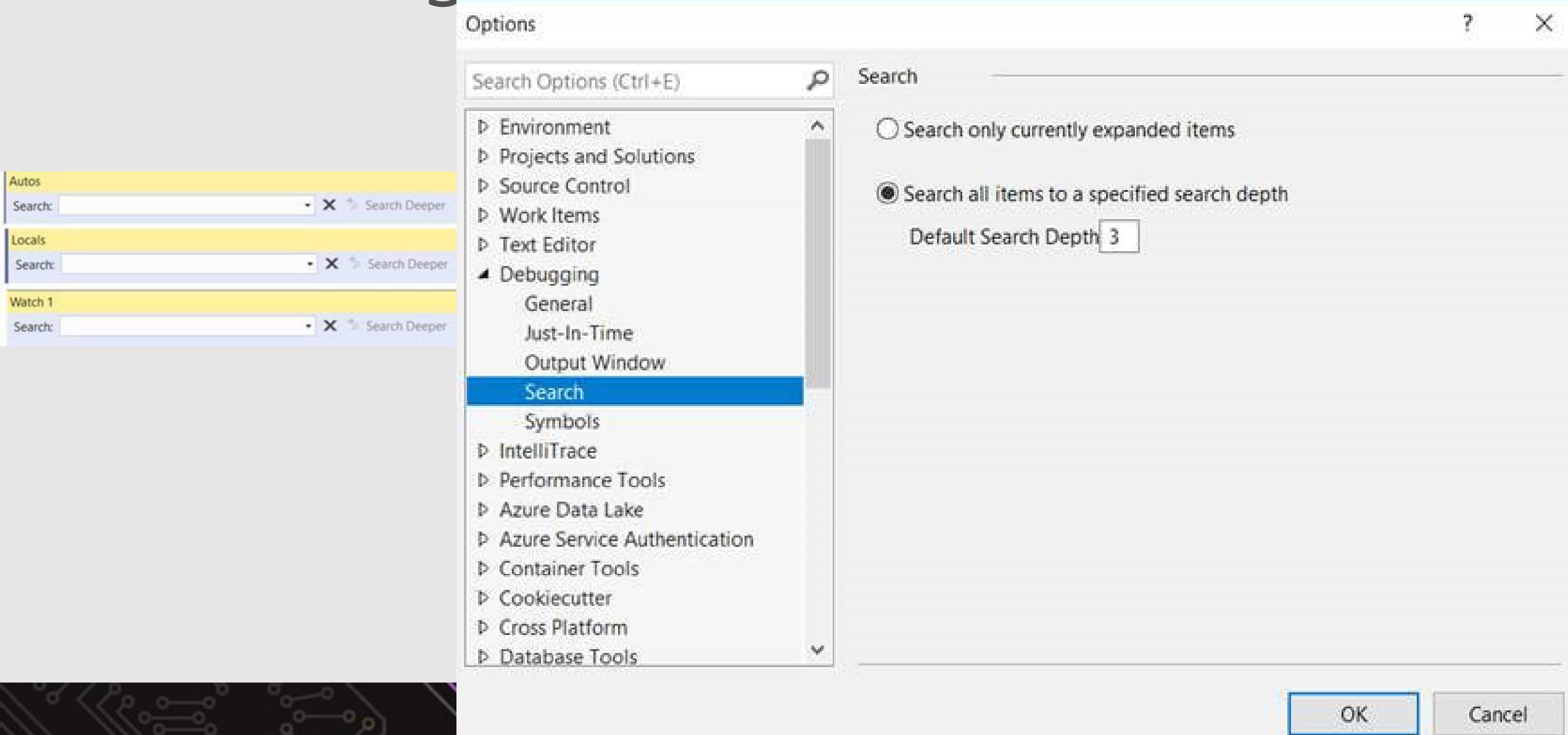
偵錯



Debugging Improvements

- Up to 50% faster stepping through code
- Search your locals and watch windows

加強 Debugger 體驗



The screenshot shows the Visual Studio Options dialog box, specifically the 'Search Options (Ctrl+E)' section under the 'Search' category. The 'Search' category is highlighted with a blue bar. The 'Search' section contains two radio button options: 'Search only currently expanded items' (unselected) and 'Search all items to a specified search depth' (selected). Below the second option is a 'Default Search Depth' input field set to '3'. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

Options

Search Options (Ctrl+E)

Search

Search only currently expanded items

Search all items to a specified search depth

Default Search Depth 3

OK Cancel

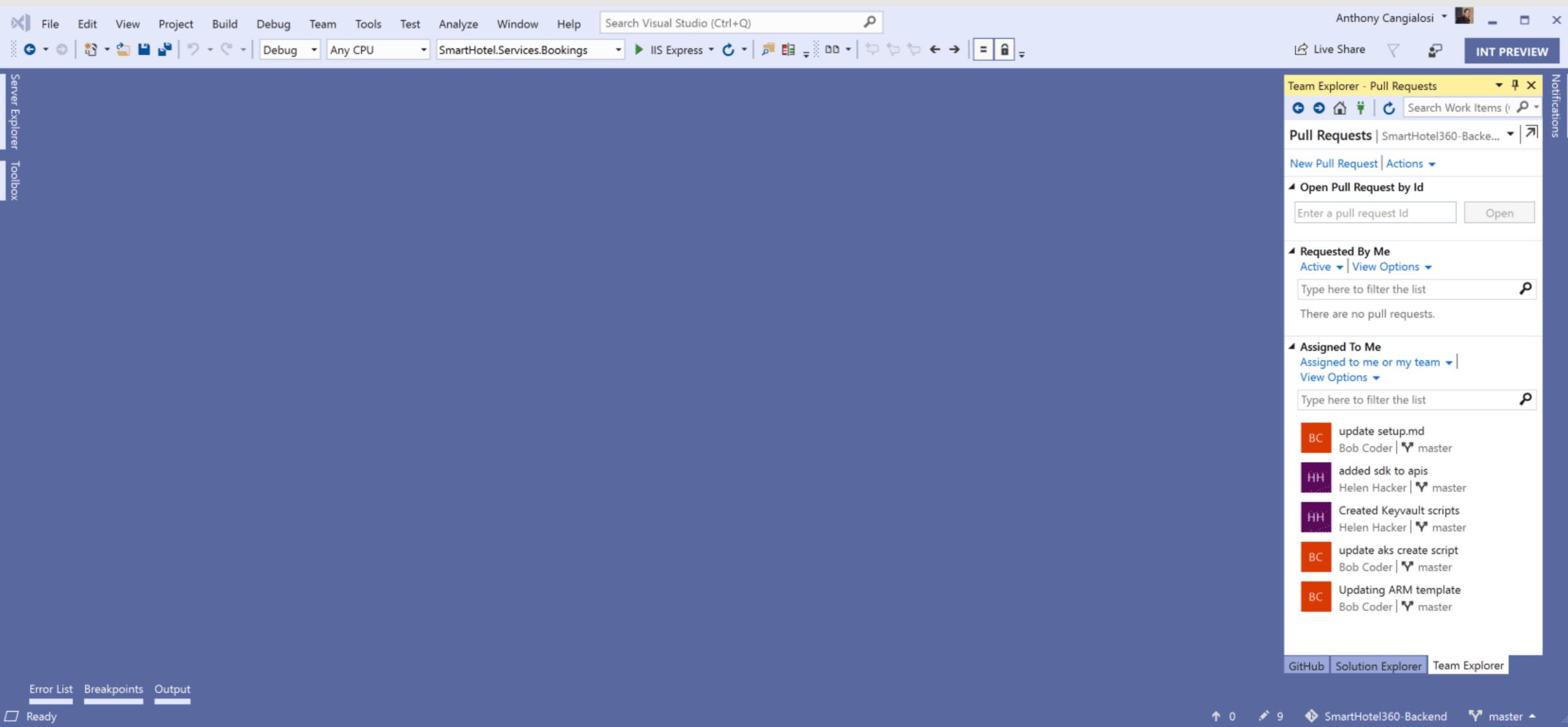
共同作業

Manage Pull Requests

- See a history of changes as you code
- Make live edits and set breakpoints in the diff view
- Create new Pull Requests on Azure Repos
- Review and checkout Pull Requests from Azure Repos
- Add Likes, make comments over any span of code and use full markdown



Pull Request 整合



Visual Studio Live Share

SESSION DETAILS

Participants (3)

- Jon W Chu • Header.js:12
- Amanda Silver • GuestbookGrid.js:13

- PJ Meyer • GuestbookGrid.js:9

Shared Servers (2)

- localhost:3000

- REST API

Shared Terminals (2)

- bash (Read-only)

- bash (Read/write)

Audio Participants (3)

- 🔊 Jon W Chu

- 🔊 Amanda Silver

- 🔊 PJ Meyer

```
1 import GridArrow from "./GridArrow";
2 import GridLegend from "./GridLegend";
3 import GuestbookGridCell from "./GuestbookGridCell";
4
5 export default class GuestbookGrid extends Component {
6   constructor(props) {
7     super(props)
8     this.state = PJ Meyer
9     | signatures: signatures
10    }
11  }
12 Amanda Silver
13 render() {
14   const cells = this.state.signatures.map((signature, index) => (
15     <GuestbookGridCell key={index} {...signature} />
16   ));
17 }
18 }
```

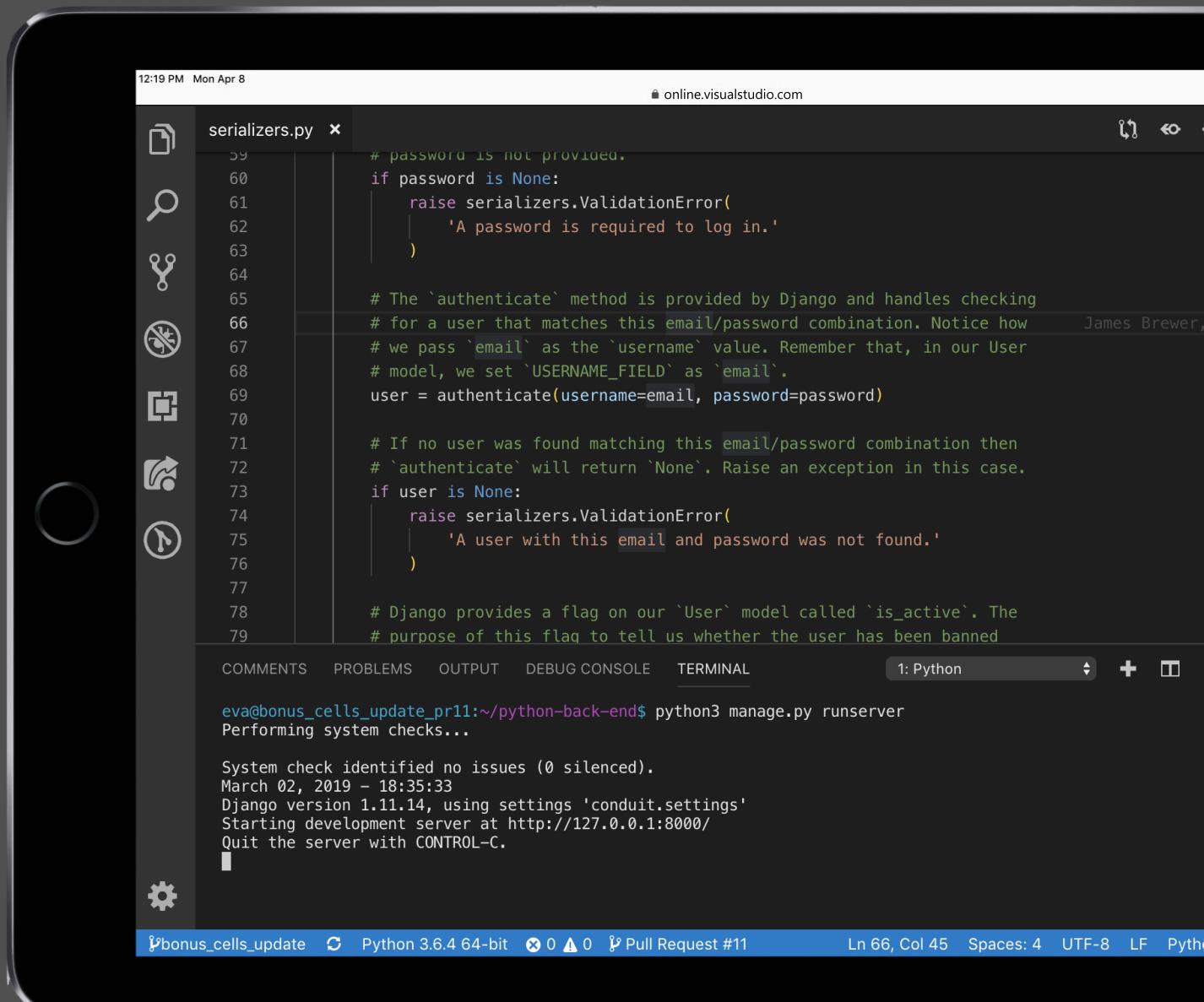
NEW

Visual Studio Online

Browser-based companion

Support for Visual Studio project types
and Visual Studio Code workspaces

Pull request reviews and
collaboration from anywhere



The screenshot shows the Visual Studio Online web application. At the top, it displays the URL online.visualstudio.com. The main area is a code editor with a Python file named `serializers.py`. The code implements a password validation logic and user authentication. Below the code editor is a navigation bar with links to `COMMENTS`, `PROBLEMS`, `OUTPUT`, `DEBUG CONSOLE`, and `TERMINAL`. The `TERMINAL` tab is selected, showing command-line output for running a Python manage script. The bottom of the screen features a status bar with information about the current session, including the file name, Python version, and pull request details.

```
# password is not provided.
if password is None:
    raise serializers.ValidationError(
        'A password is required to log in.'
)

# The `authenticate` method is provided by Django and handles checking
# for a user that matches this email/password combination. Notice how
# we pass `email` as the `username` value. Remember that, in our User
# model, we set `USERNAME_FIELD` as `email`.
user = authenticate(username=email, password=password)

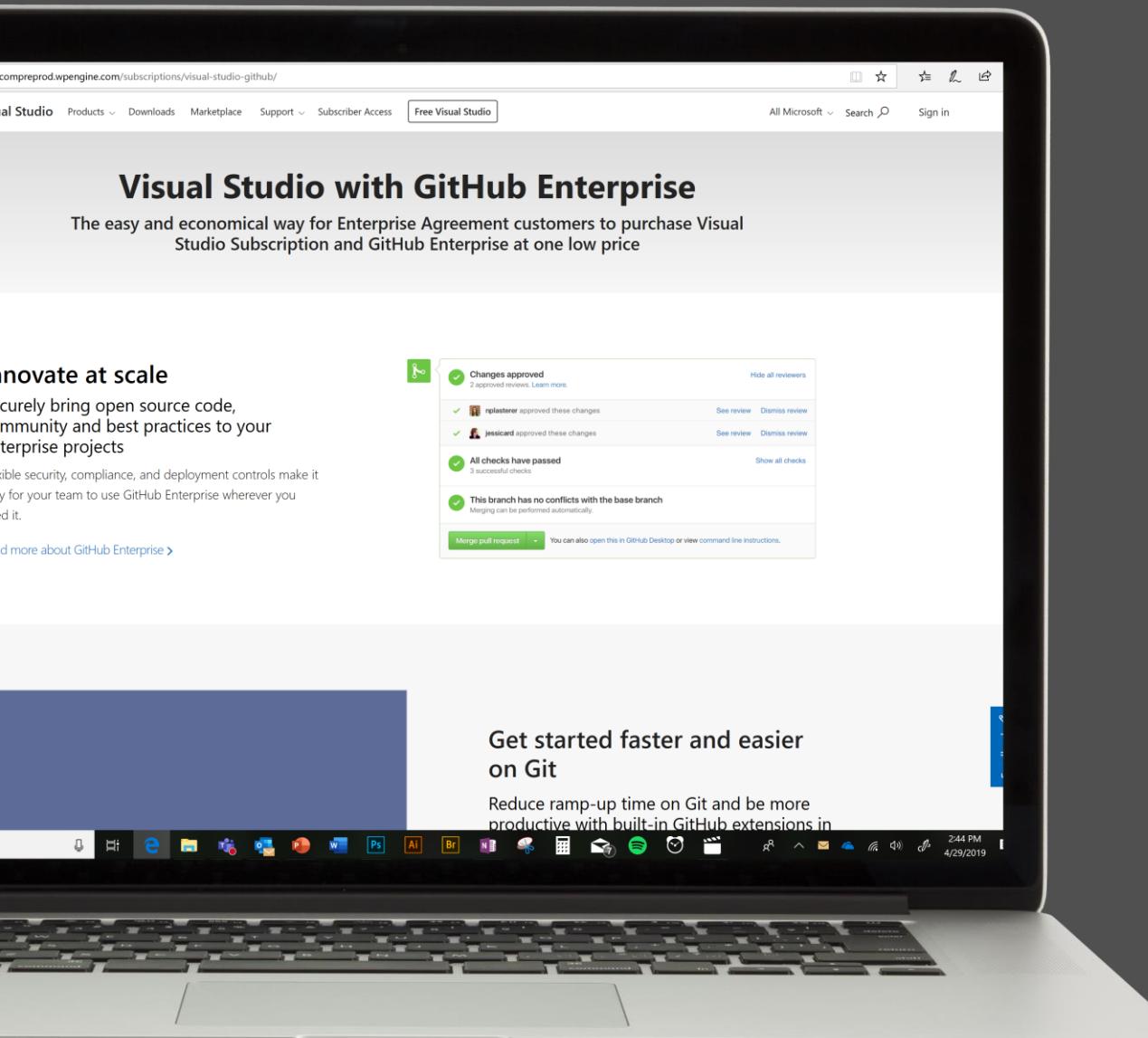
# If no user was found matching this email/password combination then
# `authenticate` will return `None`. Raise an exception in this case.
if user is None:
    raise serializers.ValidationError(
        'A user with this email and password was not found.'
)

# Django provides a flag on our `User` model called `is_active`. The
# purpose of this flag to tell us whether the user has been banned
```

COMMENTS PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: Python

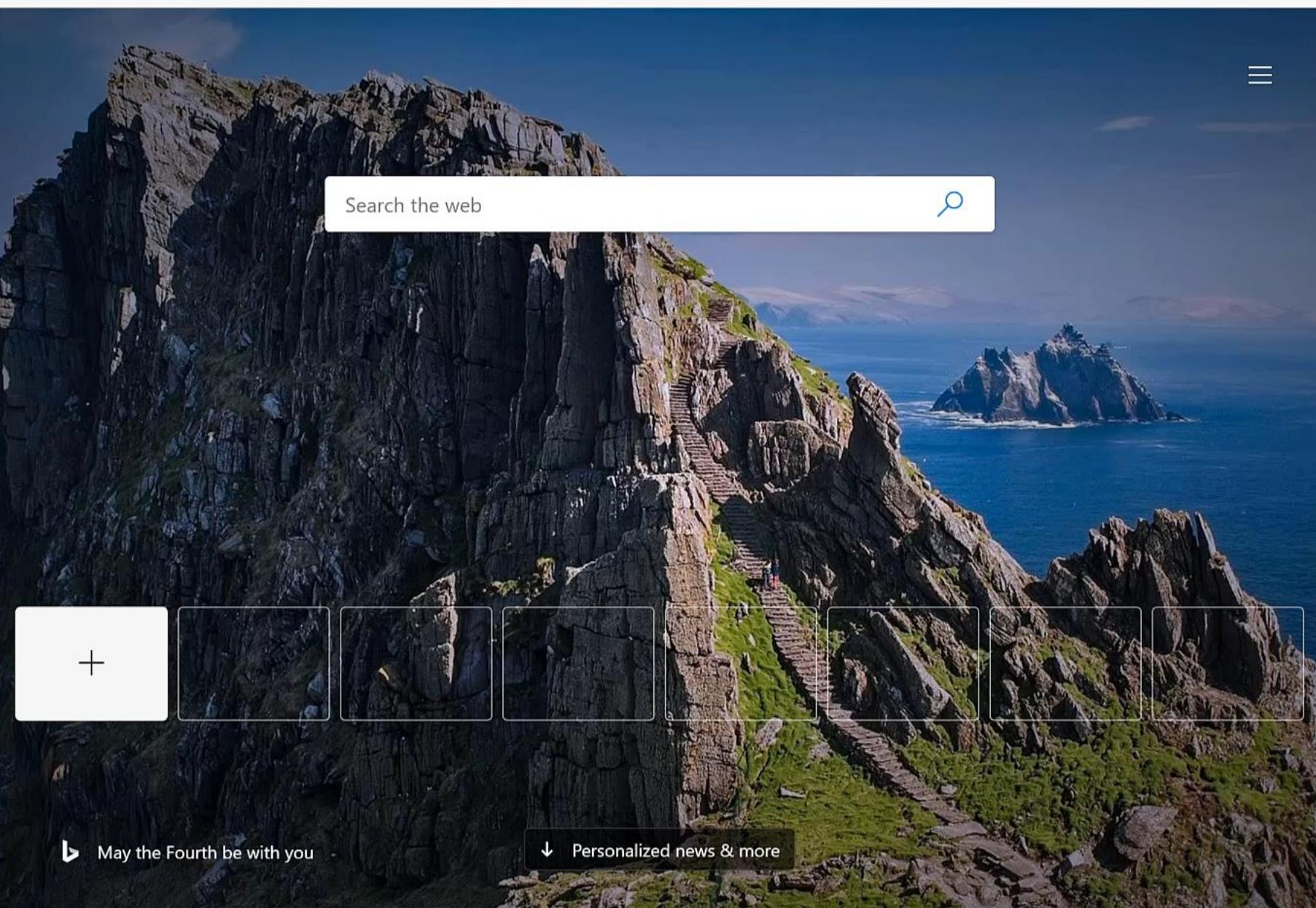
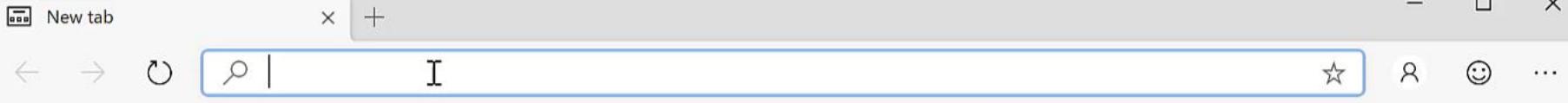
```
eva@bonus_cells_update_pr11:~/python-back-end$ python3 manage.py runserver
Performing system checks...
System check identified no issues (0 silenced).
March 02, 2019 - 18:35:33
Django version 1.11.14, using settings 'conduit.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CONTROL-C.
```

bonus_cells_update Python 3.6.4 64-bit 0 ▲ 0 Pull Request #11 Ln 66, Col 45 Spaces: 4 UTF-8 LF Python



NEW

Visual Studio Subscriptions with GitHub Enterprise



Create a new project

Recent project templates

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

 ASP.NET Core Web Application Project templates for creating ASP.NET Core applications for Windows, Linux and macOS using .NET Core or .NET Framework. Create Razor Pages, MVC, Web API, and Single Page (SPA) Applications.
C# Windows Linux macOS Web

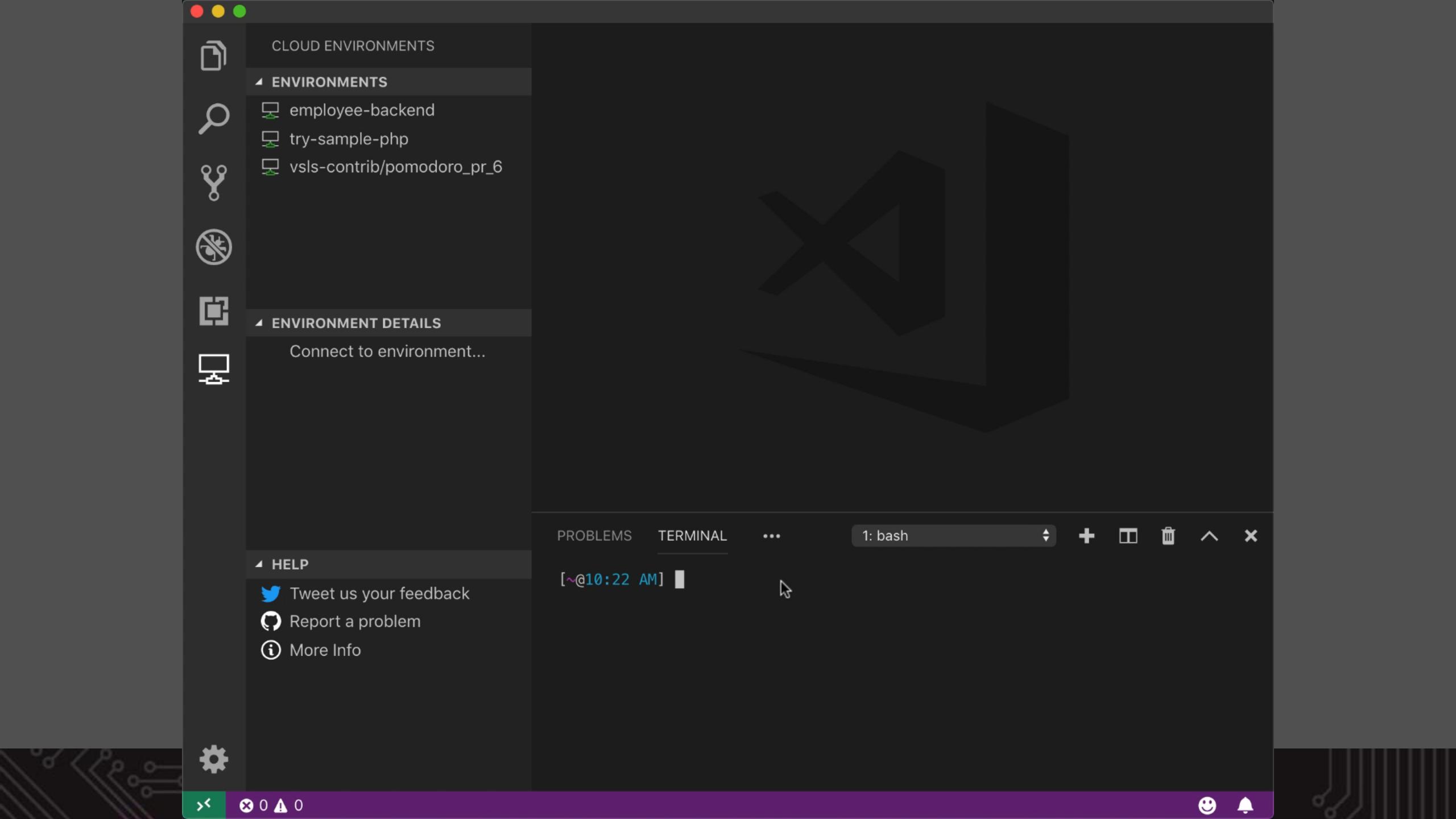
 WPF App (.NET Framework) Windows Presentation Foundation client application
C# Windows Desktop

 WPF App (.NET Core) Windows Presentation Foundation client application
C# Windows Desktop

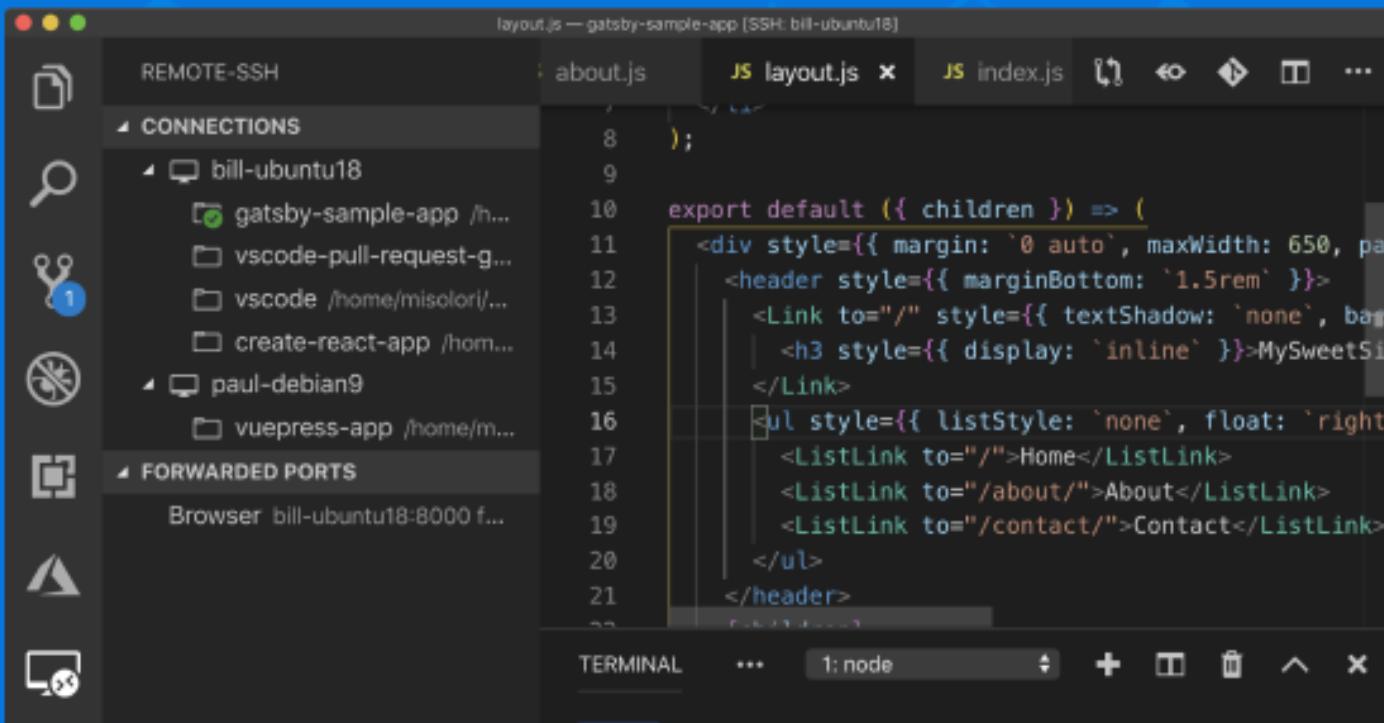
 Class Library (.NET Standard) A project for creating a class library that targets .NET Standard.
C# Android iOS Linux macOS Windows Library

 Azure Functions A template to create an Azure Function project.

Next



Visual Studio Code Remote Development



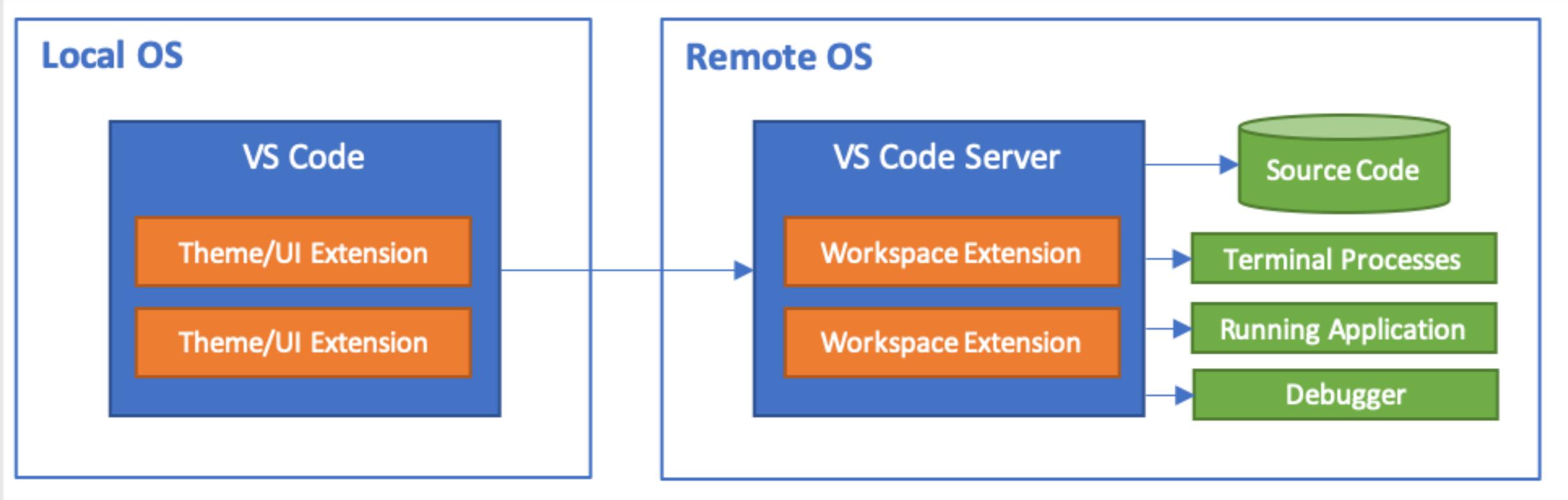
A screenshot of the Visual Studio Code interface demonstrating remote development. The left sidebar shows 'REMOTE-SSH' and 'FORWARDED PORTS'. Under 'CONNECTIONS', there are two entries: 'bill-ubuntu18' which contains 'gatsby-sample-app /h...', 'vscode-pull-request-g...', 'vscode /home/misolori/...', and 'create-react-app /hom...'; and 'paul-debian9' which contains 'vuepress-app /home/m...'. Under 'FORWARDED PORTS', it lists 'Browser bill-ubuntu18:8000 f...'. The main editor area displays a file named 'layout.js' from the 'gatsby-sample-app' project on the 'bill-ubuntu18' connection. The code shown is:

```
8 );
9
10 export default ({ children }) => (
11   <div style={{ margin: '0 auto', maxWidth: 650, padding: '20px' }}>
12     <header style={{ marginBottom: '1.5rem' }}>
13       <Link to="/" style={{ textShadow: 'none', background: 'white', color: 'black', border: '1px solid black', padding: '10px 20px', text-decoration: 'none' }}>
14         <h3 style={{ display: 'inline' }}>MySweetSite</h3>
15       </Link>
16       <ul style={{ listStyle: 'none', float: 'right', padding: '0' }}>
17         <ListLink to="/">Home</ListLink>
18         <ListLink to="/about/">About</ListLink>
19         <ListLink to="/contact/">Contact</ListLink>
20       </ul>
21     </header>
22     <main style={{ margin: '20px 0' }}>
23       {children}
24     </main>
25   </div>
26 )
```

The bottom of the interface shows the 'TERMINAL' tab and a status bar indicating '1:node'.



VS Code Remote Development



DEMO

VS Code Remote Development

NET



Q&A

Thank You

