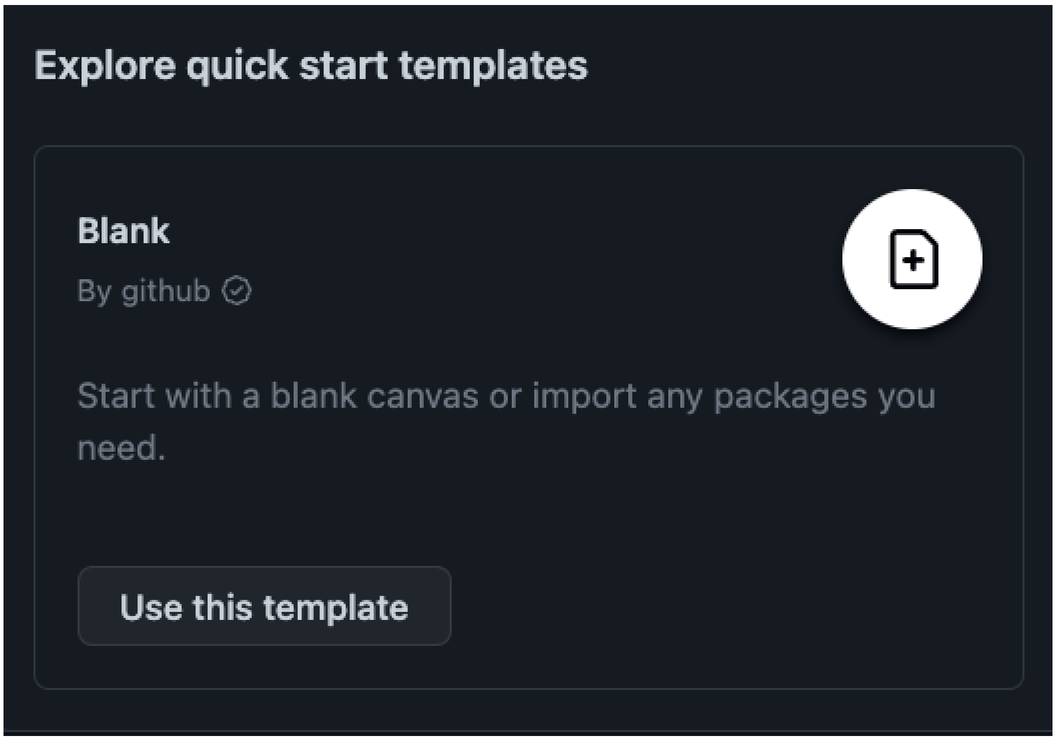
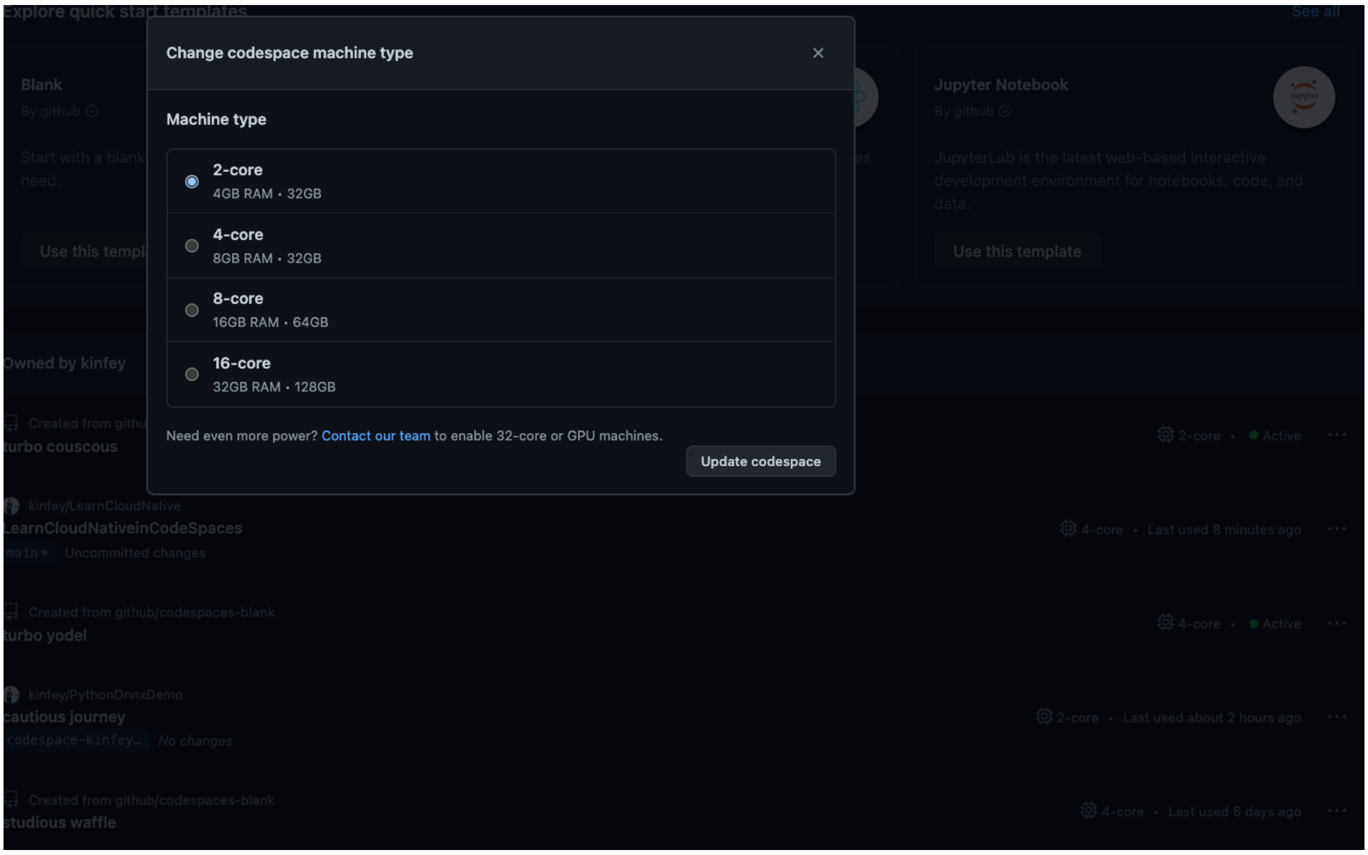
配置 GitHub Codespaces 上的云原生开发环境

现阶段有非常多的云原生技术，通过 GitHub Codespaces 我们可以应对不同的云原生场景。如容器的开发，如 K8s 应用场景的配置以及维护，可以协助不同的项目上云。这对于开发团队有不同的挑战，首先环境的统一性，其次就是多场景多技术的整合。或者你可以把 GitHub Codespaces 看做成一个云端的在线 Visual Studio Code ， 但他的功能至于 Visual Studio Code ， 不仅兼容插件，还支持不同的云端场景以及模版。我们可以快速通过 GitHub Codespaces 构建云原生的开发环境。下面我们就通过简易的步骤构建一个云原生开发环境。

1. 选择空模版构建一个 GitHub Codespaces 项目


Explore quick start templates
Blank
By github
Start with a blank canvas or import any packages you need.
Use this template

2. 并把机器配置切换为 4核 CPU , 8GB 内存 , 32GB 存储



Change codespace machine type

Machine type

- ● 2-core — 4GB RAM · 32GB
- ○ 4-core — 8GB RAM · 32GB
- ○ 8-core — 16GB RAM · 64GB
- ○ 16-core — 32GB RAM · 128GB

Need even more power? Contact our team to enable 32-core or GPU machines.

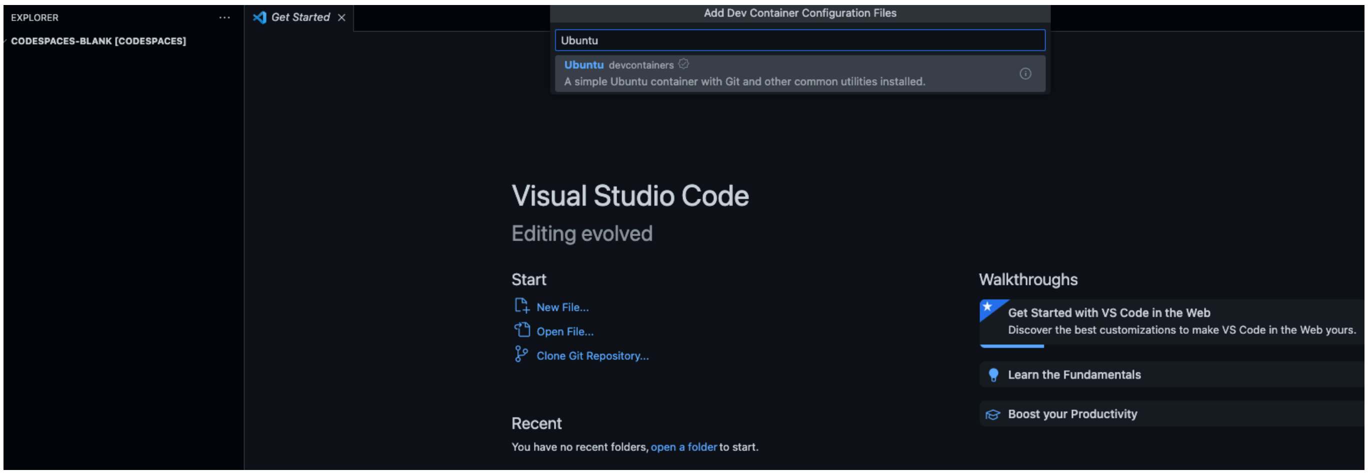
Update codespace

Owned by kinfey

turbo couscous	2-core · Active
kinfey/LearnCloudNative LearnCloudNativeinCodeSpaces main • Uncommitted changes	4-core · Last used 8 minutes ago
Created from github/codespaces-blank turbo yodel	4-core · Active
kinfey/PythonOnnxDemo cautious journey codespace-kinfey… No changes	2-core · Last used about 2 hours ago
Created from github/codespaces-blank studious waffle	4-core · Last used 6 days ago

3. 为 GitHub Codespaces 搭配设置好环境

macOS 使用 CMD + Shift + P , Windows / Linux 使用 Ctrl + Shift + P 选择 Codespaces 下的 Add Dev Container 选择 Ubuntu 22.04 开发容器 (对于云原生环境 Ubuntu 是最好的开发系统)



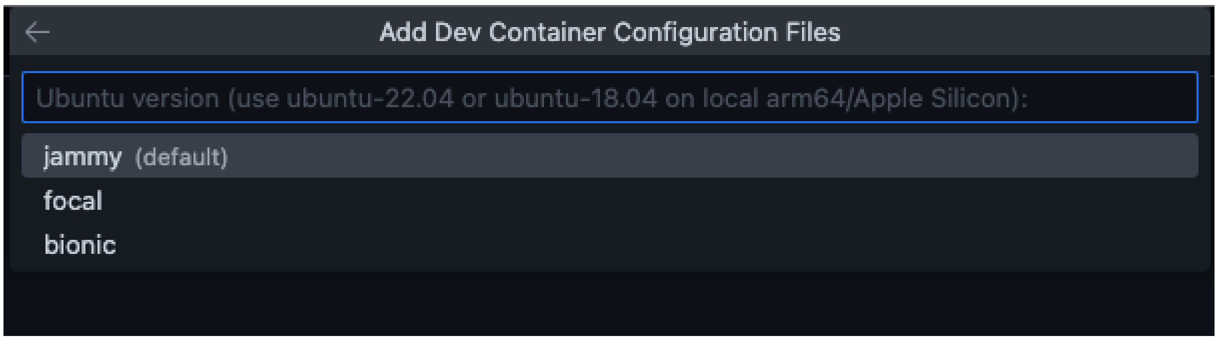
Add Dev Container Configuration Files

Ubuntu

Ubuntu devcontainers
A simple Ubuntu container with Git and other common utilities installed.

EXPLORER
CODESPACES-BLANK [CODESPACES]
Get Started
Visual Studio Code
Editing evolved
Start
New File...
Open File...
Clone Git Repository...
Recent
You have no recent folders, open a folder to start.
Walkthroughs
Get Started with VS Code in the Web
Discover the best customizations to make VS Code in the Web yours.
Learn the Fundamentals
Boost your Productivity

版本选择 jammy - 22.04



Add Dev Container Configuration Files

Ubuntu version (use ubuntu-22.04 or ubuntu-18.04 on local arm64/Apple Silicon):

- jammy (default)
- focal
- bionic

4. 添加不同的 SDK 和语言环境的支持

Azure 相关的如 Azure CLI， Azure Functions 等

Dotnet CLI , Miniforge , 以及 nodejs 等

选择成功后可以参考以下 devcontainer.json 的配置

```
{
    "name": "Ubuntu",
    "image": "mcr.microsoft.com/devcontainers/base:jammy",
    "features": {
        "ghcr.io/devcontainers/features/azure-cli:1": {},
        "ghcr.io/devcontainers/features/dotnet:1": {},
        "ghcr.io/devcontainers/features/node:1": {},
        "ghcr.io/rocker-org/devcontainer-features/miniforge:0": {},
        "ghcr.io/jlaundry/devcontainer-features/azure-functions-core-
tools:1": {}
    }


}
```

5. 这里可以为环境添加一些 extensions 的插件

在 devcontainer.json 增加下面的语句， 为你的云原生 GitHub Codespaces 环境添加 .NET , Python , Thunder-Client 等插件。

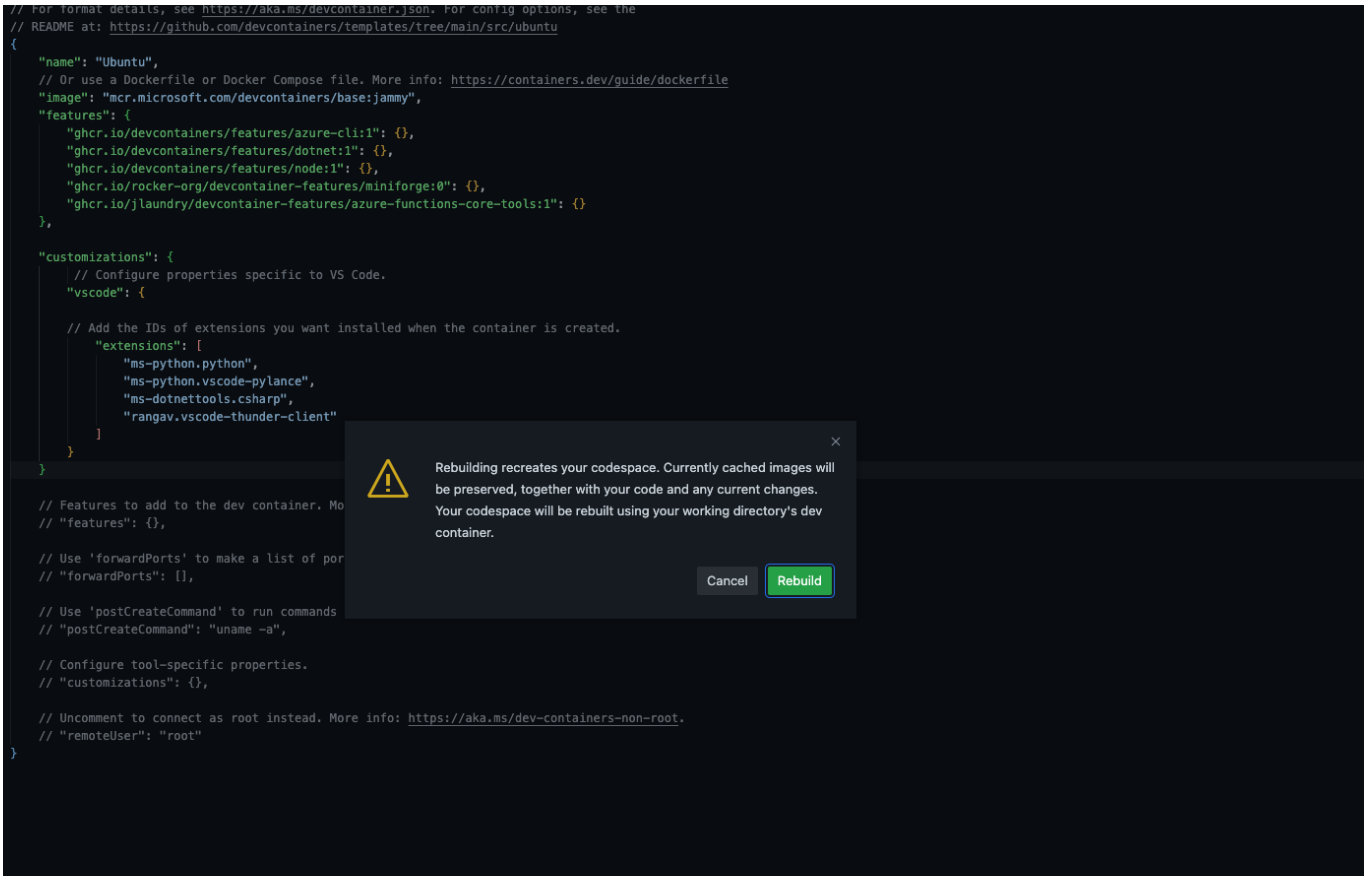
```
    "customizations": {
         // Configure properties specific to VS Code.
        "vscode": {

        // Add the IDs of extensions you want installed when the container
is created.
            "extensions": [
                "ms-python.python",
                "ms-python.vscode-pylance",
                "ms-dotnettools.csharp",
                "rangav.vscode-thunder-client"
            ]
        }
    }
```

我们可以看看完整的 devcontainer.json

```
// For format details, see https://aka.ms/devcontainer.json. For config
options, see the
// README at:
https://github.com/devcontainers/templates/tree/main/src/ubuntu
{
    "name": "Ubuntu",
    // Or use a Dockerfile or Docker Compose file. More info:
https://containers.dev/guide/dockerfile
    "image": "mcr.microsoft.com/devcontainers/base:jammy",
    "features": {
        "ghcr.io/devcontainers/features/azure-cli:1": {},
        "ghcr.io/devcontainers/features/dotnet:1": {},
        "ghcr.io/devcontainers/features/node:1": {},
        "ghcr.io/rocker-org/devcontainer-features/miniforge:0": {},
        "ghcr.io/jlaundry/devcontainer-features/azure-functions-core-
tools:1": {}
    },
    "customizations": {
         // Configure properties specific to VS Code.
        "vscode": {

        // Add the IDs of extensions you want installed when the container
is created.
            "extensions": [
                "ms-python.python",
                "ms-python.vscode-pylance",
                "ms-dotnettools.csharp",
                "rangav.vscode-thunder-client"
            ]
        }
    }

    // Features to add to the dev container. More info:
https://containers.dev/features.
    // "features": {},

    // Use 'forwardPorts' to make a list of ports inside the container
available locally.
    // "forwardPorts": [],

    // Use 'postCreateCommand' to run commands after the container is
created.
    // "postCreateCommand": "uname -a",

    // Configure tool-specific properties.
    // "customizations": {},

    // Uncomment to connect as root instead. More info:
https://aka.ms/dev-containers-non-root.
    // "remoteUser": "root"
}
```

```

```

6. 完成后， Rebuild 你的 GitHub Codespaces

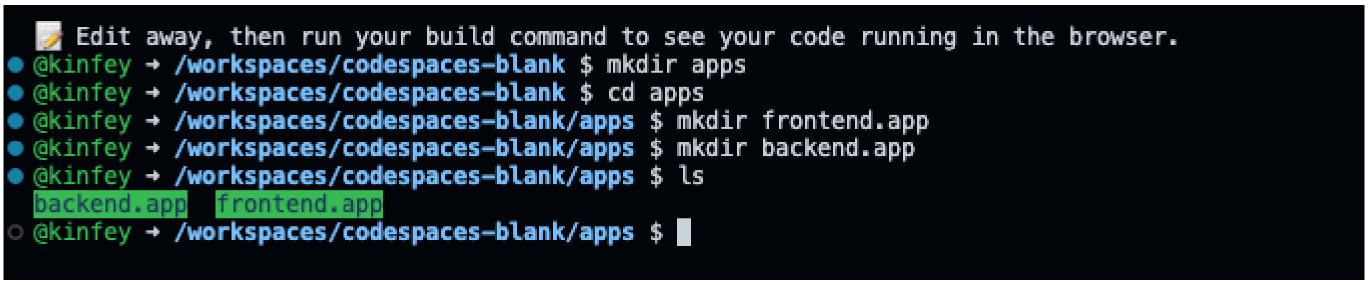


```
// For format details, see https://aka.ms/devcontainer.json. For config options, see the
// README at: https://github.com/devcontainers/templates/tree/main/src/ubuntu
{
    "name": "Ubuntu",
    // Or use a Dockerfile or Docker Compose file. More info: https://containers.dev/guide/dockerfile
    "image": "mcr.microsoft.com/devcontainers/base:jammy",
    "features": {
        "ghcr.io/devcontainers/features/azure-cli:1": {},
        "ghcr.io/devcontainers/features/dotnet:1": {},
        "ghcr.io/devcontainers/features/node:1": {},
        "ghcr.io/rocker-org/devcontainer-features/miniforge:0": {},
        "ghcr.io/jlaundry/devcontainer-features/azure-functions-core-tools:1": {}
    },

    "customizations": {
         // Configure properties specific to VS Code.
        "vscode": {

        // Add the IDs of extensions you want installed when the container is created.
            "extensions": [
                "ms-python.python",
                "ms-python.vscode-pylance",
                "ms-dotnettools.csharp",
                "rangav.vscode-thunder-client"
            ]
        }
    }

    // Features to add to the dev container. Mo
    // "features": {},

    // Use 'forwardPorts' to make a list of por
    // "forwardPorts": [],

    // Use 'postCreateCommand' to run commands
    // "postCreateCommand": "uname -a",

    // Configure tool-specific properties.
    // "customizations": {},

    // Uncomment to connect as root instead. More info: https://aka.ms/dev-containers-non-root.
    // "remoteUser": "root"
}
```

Rebuilding recreates your codespace. Currently cached images will be preserved, together with your code and any current changes. Your codespace will be rebuilt using your working directory's dev container.

你的环境就配置好了，接下来我们尝试构建两个项目，为后面的联系打好基础

在终端创建一个文件夹 apps， 并在 apps 下构建一个 backend.app 和 frontend.app 的子文件夹



```
 📝 Edit away, then run your build command to see your code running in the browser.
● @kinfey → /workspaces/codespaces-blank $ mkdir apps
● @kinfey → /workspaces/codespaces-blank $ cd apps
● @kinfey → /workspaces/codespaces-blank/apps $ mkdir frontend.app
● @kinfey → /workspaces/codespaces-blank/apps $ mkdir backend.app
● @kinfey → /workspaces/codespaces-blank/apps $ ls
backend.app  frontend.app
○ @kinfey → /workspaces/codespaces-blank/apps $ 
```

项目一： 构建一个 .NET Blazor Web Assbembly 应用

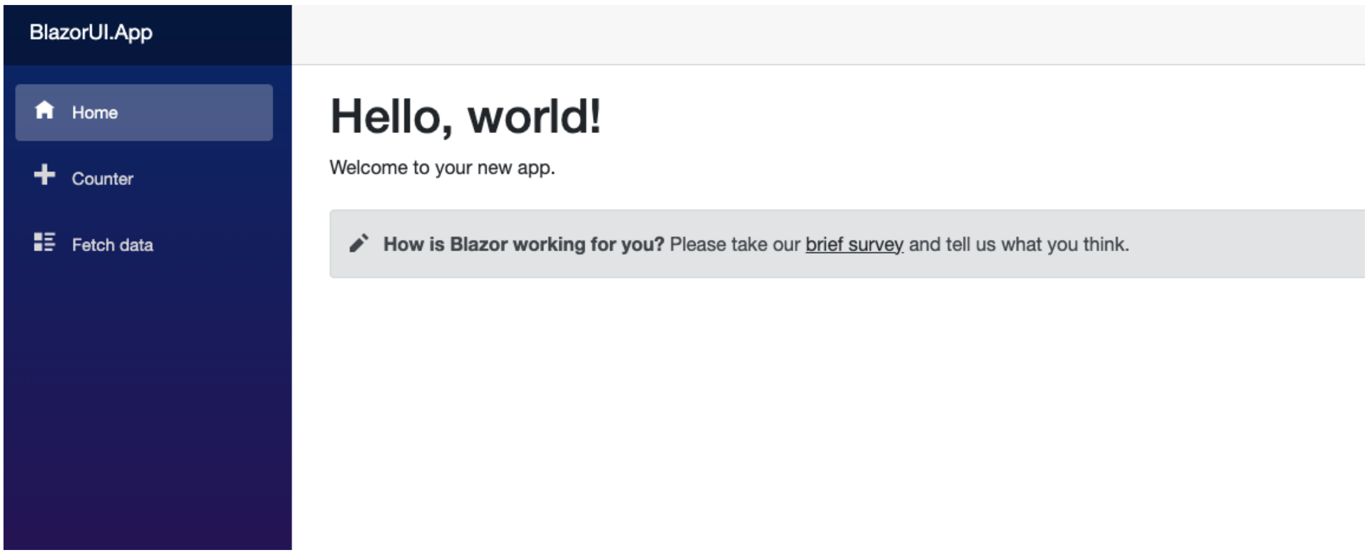
1. 通过终端进入刚才建立好的 frontend.app 文件夹

```
cd apps
cd frontend.app
```

2. 在 frontend.app 下输入以下命令构建一个 .NET Blazor Wasm 应用

```
dotnet new blazorwasm -o BlazorUI.App

cd BlazorUI.App

dotnet restore

dotnet build

dotnet run
```

3. 在浏览器可以直接打开 Blazor Wasm 的应用



Hello, world!

Welcome to your new app.

How is Blazor working for you? Please take our brief survey and tell us what you think.

项目二： 构建一个 Python 写的 Azure Functions

1. 进入终端， 安装配置好你的 Python

```
conda create -n pydev python=3.9.10

conda activate pydev
```

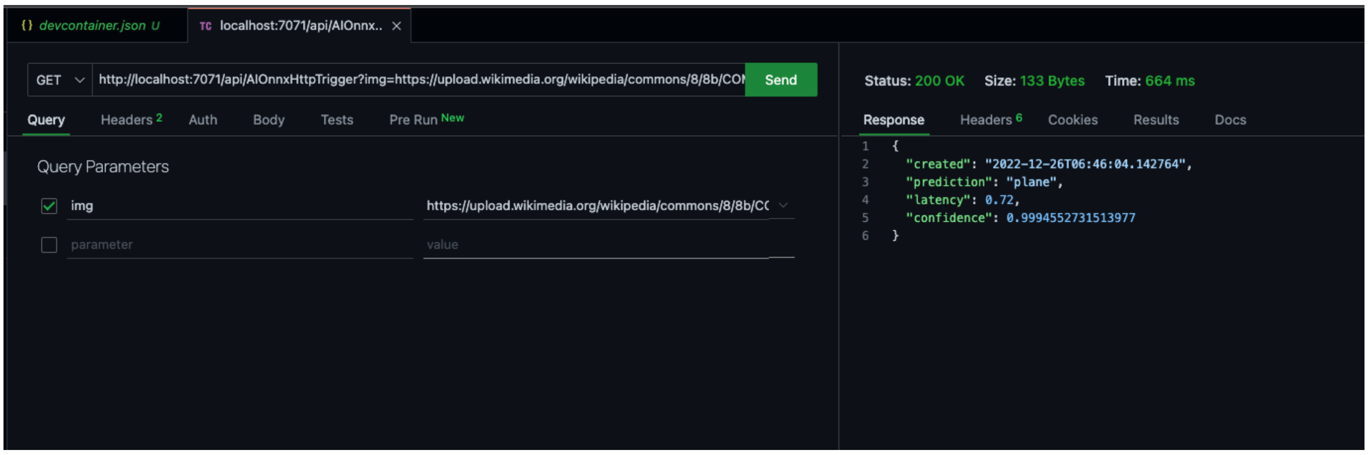
2. macOS 使用 CMD + Shift + P , Windows / Linux 使用 Ctrl + Shift + P 选择 Azure Functions 下的 Create Function , 选择好之前构建的 backend.app 文件夹， 选择 HttpTrigger 和匿名访问 ， 并命名为 AIOnnxHttpTrigger

3. 把 https://github.com/kinfey/PythonOnnxDemo/tree/codespace-kinfey-bug-free-space-winner-gwjxj67qvv6fvr6/OnnxHttpTriggerDemo 内的文件替换为 AIOnnxHttpTrigger 文件下的文件

4. 在命令行通过 func start 启动你的 Azure Functions

```
func start
```

5. 通过 Thunder Client 验证一下



GET http://localhost:7071/api/AIOnnxHttpTrigger?img=https://upload.wikimedia.org/wikipedia/commons/8/8b/CO

Query Parameters

✓ img	https://upload.wikimedia.org/wikipedia/commons/8/8b/C(
parameter	value

Status: 200 OK Size: 133 Bytes Time: 664 ms

```
{
  "created": "2022-12-26T06:46:04.142764",
  "prediction": "plane",
  "latency": 0.72,
  "confidence": 0.9994552731513977
}
```

这样大家就完成了本次 GitHub Codespaces 的云原生环境配置了，如果大家希望了解更多请进入下一章节

相关资源

0. 注册你的 GitHub https://github.com/signup
1. 了解 GitHub Codespaces https://github.com/features/codespaces
2. 学习 .NET Blazor 的相关知识 https://dotnet.microsoft.com/en-us/apps/aspnet/web-apps/blazor
3. 学习 Azure Functions 的相关知识 https://learn.microsoft.com/en-us/azure/azure-functions/functions-overview