

# Continuous delivery by using GitHub Actions

Use [GitHub Actions](#) to define a workflow to automatically build and deploy code to your function app in Azure Functions.

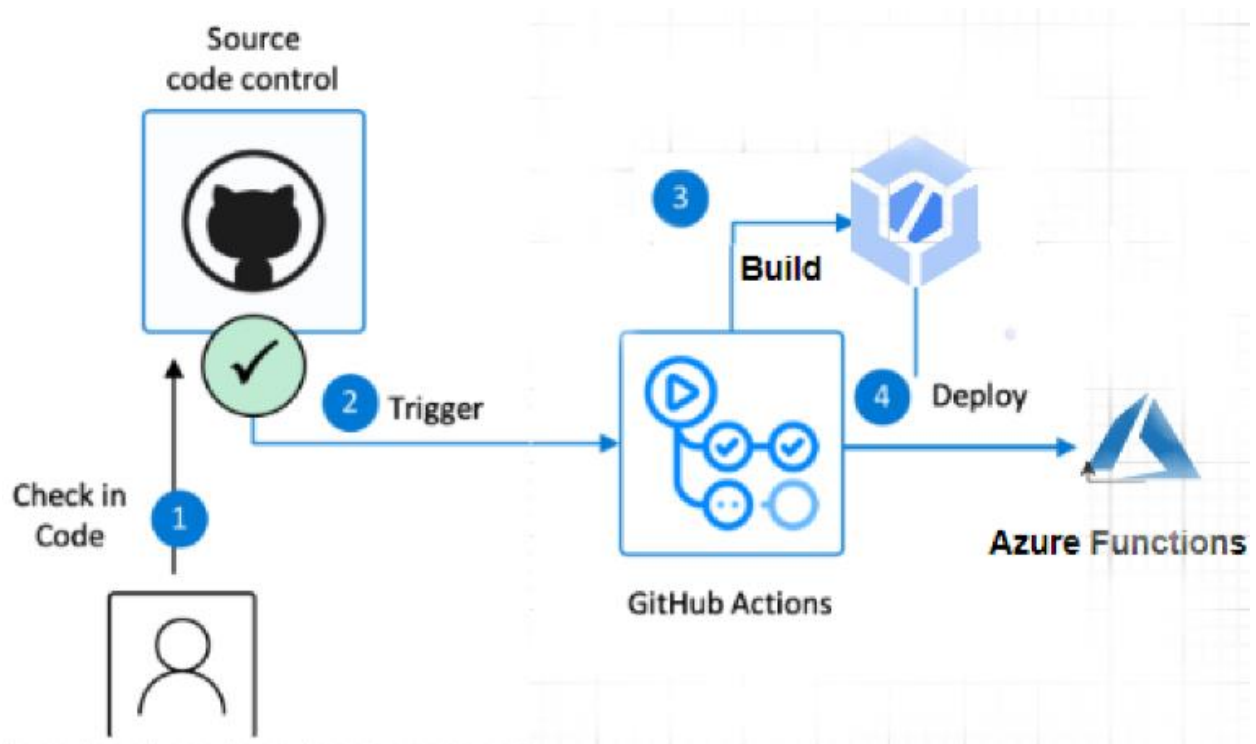
In GitHub Actions, a [workflow](#) is an automated process that you define in your GitHub repository. This process tells GitHub how to build and deploy your function app project on GitHub.

A workflow is defined by a YAML (.yml) file in the `/.github/workflows/` path in your repository. This definition contains the various steps and parameters that make up the workflow.

For an Azure Functions workflow, the file has three sections:

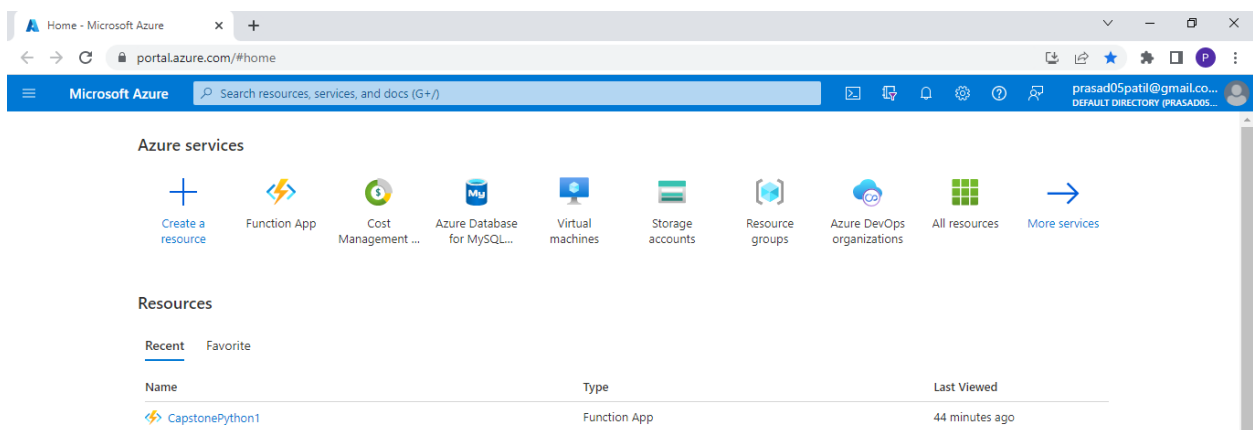
Section	Tasks
Authentication	Download a publish profile. Create a GitHub secret.
Build	Set up the environment. Build the function app.
Deploy	Deploy the function app.

## Architectural Diagram



## Implementation :

Step 1 - Login to Azure Subscription using Microsoft Account.



Step 2 – Login to GitHub account and push the Function App to Github Repository.

```

MINGW64:/c/Users/Master/Desktop/GLCapstone8
Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ notepad

Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ notepad .github/workflows/capstonepython1.yml
2022-10-25T11:16:26.512ZE [16084:NonCelloThread] thumbnail_util_win.cc:115:LoadBitmapFromPngResource Can't find PNG resource 0.
2022-10-25T11:16:26.514ZI [16084:NonCelloThread] ctxmenu.cc:213:GenerateContextMenu Received context menu with 0 menu items.

Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ git add ,
fatal: pathspec ', ' did not match any files

Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ git add .

Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ git commit -m "Add workflow"
[main 9dac661] Add workflow
1 file changed, 77 insertions(+)
create mode 100644 .github/workflows/capstonepython1.yml

Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ git push origin main --force
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (5/5), 1.16 KiB | 1.16 MiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/prasad05patil/greatlearning.git
   ec633d6..9dac661  main -> main

Master@Master MINGW64 ~/Desktop/GLCapstone8 (main)
$ |

```

prasad05patil/greatlearning: Gre... x +

github.com/prasad05patil/greatlearning

Search or jump to... Pull requests Issues Marketplace Explore

prasad05patil / greatlearning Public

Pin Unwatch 1 Fork 0 Star 0

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

main 1 branch 0 tags Go to file Add file Code

File	Commit	Time
prasad05patil Update capstonepython1.yml	2a40800	1 hour ago
.github/workflows	Update capstonepython1.yml	1 hour ago
.vscode	first commit	1 hour ago
GLCapstone8	first commit	1 hour ago
.funcignore	first commit	1 hour ago
.gitignore	first commit	1 hour ago
host.json	first commit	1 hour ago
requirements.txt	first commit	1 hour ago

Help people interested in this repository understand your project by adding a README. [Add a README](#)

About Great Learning Capstone Project

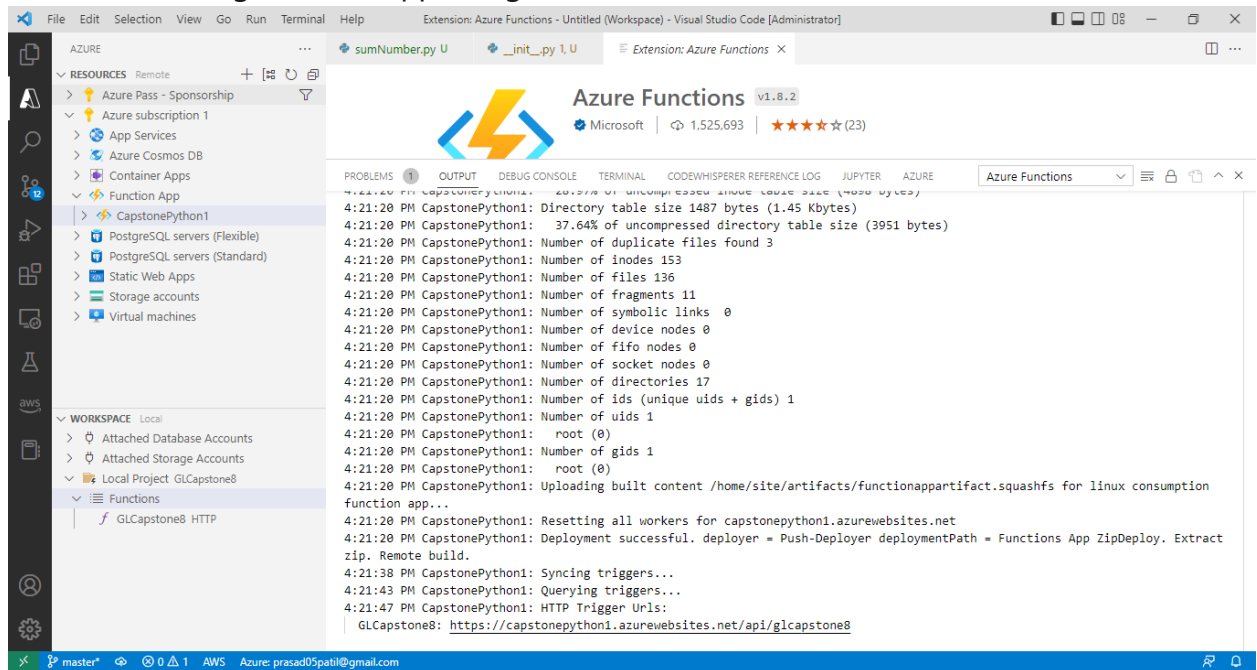
0 stars 1 watching 0 forks

Releases No releases published [Create a new release](#)

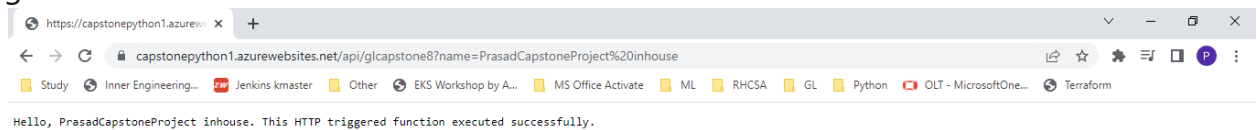
Packages No packages published [Publish your first package](#)

Environments 1

### Step 3 – Create working function app using Visual Studio



### Step 4 – Trigger the Function using HTTP Trigger to verify if the function is active and running :



## Step 5 – Verify function deployed using Visual studio Code in Azure Portal :

The screenshot displays the Azure Portal interface for a Function App named 'CapstonePython1'. The left sidebar contains navigation options such as Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Events (preview), Functions, App keys, App files, Proxies, Deployment slots, and Deployment Center. The main content area shows the 'Essentials' tab with the following details:

- Resource group (move): [greatlearning2](#)
- Status: Running
- Location: Central US
- Subscription (move): [Azure subscription 1](#)
- Subscription ID: e6a994ea-385a-4a73-a098-69b6362a1331
- Tags (edit): [Click here to add tags](#)
- URL: <https://capstonepython1.azurewebsites.net>
- Operating System: Linux
- App Service Plan: [ASP-greatlearning2-a76b \(Y1:0\)](#)
- Properties: [See More](#)
- Runtime version: 4.12.2.2

Below the Essentials tab, there are two charts: 'Memory working set' and 'Function Execution Count'. The 'Memory working set' chart shows a line graph with values ranging from 400 to 1000. The 'Function Execution Count' chart shows a line graph with values ranging from 0.6 to 1.0.

The screenshot shows the landing page for the 'Your Functions 4.0 app is up and running' in the Azure Portal. The page features a blue background with a lightbulb icon containing a code symbol, a city skyline, and a large ': -)' smiley face. The text on the page reads:

Microsoft Azure

Your Functions 4.0 app is up and running

Azure Functions is an event-based serverless compute experience to accelerate your development.

[Learn more](#)

## Step 6 – Download your publish profile of Azure function to integration with Github

The screenshot shows the Azure Portal interface for a Function App named 'CapstonePython1'. The top navigation bar includes the Microsoft Azure logo and a search bar. The left sidebar contains a search bar and a list of navigation items: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Events (preview), Functions, Functions, App keys, App files, and Proxies. The main content area is divided into two sections. The top section, 'Essentials', displays key information about the Function App: Resource group (greatlearning2), Status (Running), Location (Central US), Subscription ID (e6a994ea-385a-4a73-a098-69b6362a1331), Tags (Click here to add tags), URL (https://capstonepython1.azurewebsites.net), Operating System (Linux), App Service Plan (ASP-greatlearning2-a76b (Y1:0)), Properties (See More), and Runtime version (4.12.2.2). The bottom section, 'Metrics', shows two charts: 'Memory working set' and 'Function Execution Count'. The 'Get publish profile' button is highlighted in the top toolbar. The left sidebar shows the 'Deployment' section with 'Capsto... PublishSettings' highlighted.

## Step 7 – Add the GitHub secret and add Publish Settings as secrets :

The screenshot shows the GitHub Actions secrets page for the repository 'prasad05patil/greatlearning'. The top navigation bar includes the GitHub logo and a search bar. The left sidebar contains a list of navigation items: Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The main content area is divided into two sections. The top section, 'General', displays the 'Actions secrets' title and a 'New repository secret' button. The bottom section, 'Environment secrets', shows 'There are no secrets for this repository's environments.' The 'Repository secrets' section shows a secret named 'AZURE\_FUNCTIONAPP\_PUBLISH\_PROFILE' with a warning icon and an update timestamp of 'Updated 10 seconds ago'.

## Step 8 – Create the Github Actions Workflow YAML File :

greatlearning/capstonepython1 x Actions · prasado5patil/greatlear x +

github.com/prasado5patil/greatlearning/blob/main/github/workflows/capstonepython1.yml

Search or jump to... Pull requests Issues Marketplace Explore

prasado5patil / greatlearning Public

Pin Unwatch 1 Fork 0 Star 0

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

main greatlearning / .github / workflows / capstonepython1.yml View runs Go to file

prasado5patil Update capstonepython1.yml Latest commit 2a4e8e0 10 seconds ago History

1 contributor

68 lines (65 sloc) 2.2 KB Raw Blame

```
1 name: Build and deploy Python project to Azure Function App - CapstonePython1
2
3 on:
4   push:
5     branches:
6       - main
7   workflow_dispatch:
8
9 env:
10  AZURE_FUNCTIONAPP_PACKAGE_PATH: '.' # set this to the path to your web app project, defaults to the repository root
11  PYTHON_VERSION: '3.9' # set this to the python version to use (supports 3.6, 3.7, 3.8)
12  AZURE_FUNCTIONAPP_NAME: 'CapstonePython1'
13
14 jobs:
15   build:
16     runs-on: ubuntu-latest
```

## Step 9 – Modify YAML file with Build definitions for building function app

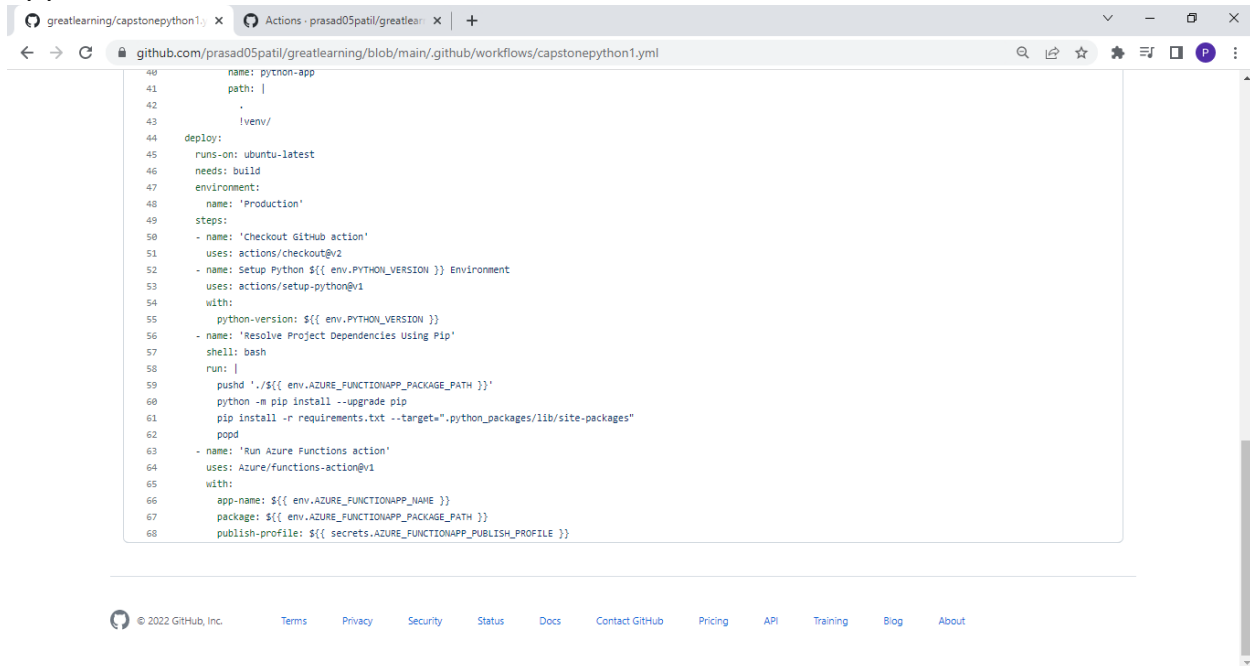
greatlearning/capstonepython1 x Actions · prasado5patil/greatlear x +

github.com/prasado5patil/greatlearning/blob/main/github/workflows/capstonepython1.yml

14 jobs:

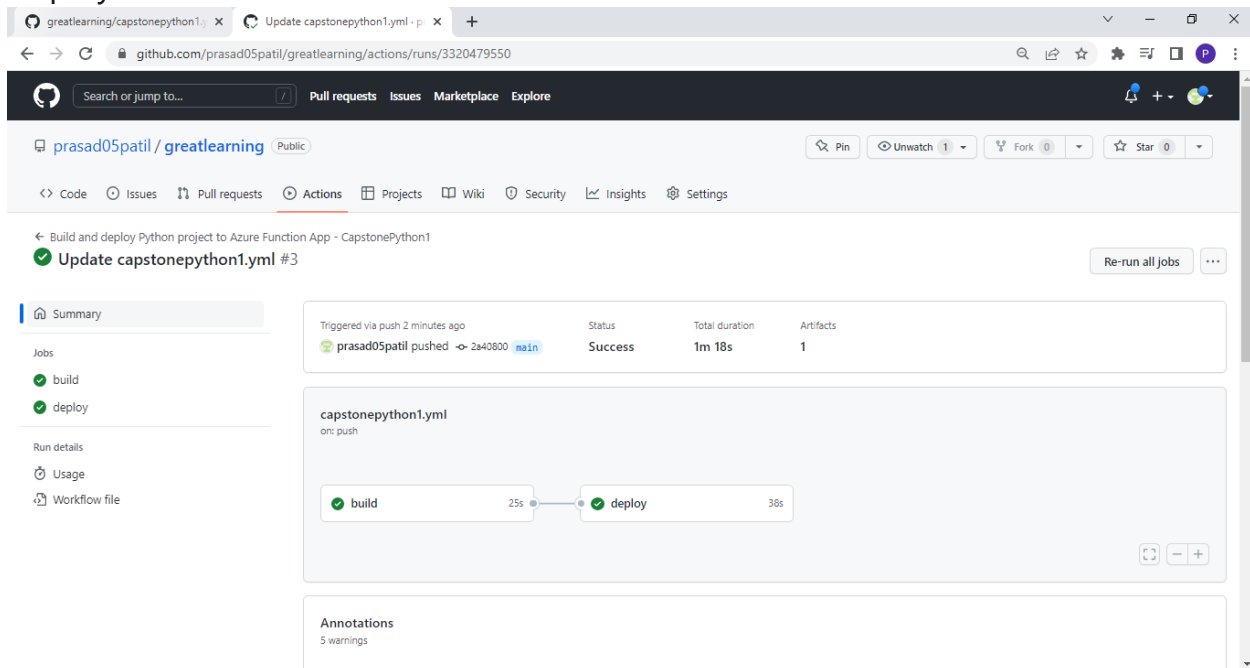
```
15   build:
16     runs-on: ubuntu-latest
17     steps:
18       - name: Checkout repository
19         uses: actions/checkout@v2
20       - name: Setup Python version
21         uses: actions/setup-python@v1
22         with:
23           python-version: ${{ env.PYTHON_VERSION }}
24       - name: Create and start virtual environment
25         run: |
26           python -m venv venv
27           source venv/bin/activate
28       - name: Install dependencies
29         run: pip install -r requirements.txt
30       - name: 'Resolve Project Dependencies Using Pip'
31         shell: bash
32         run: |
33           pushd './${{ env.AZURE_FUNCTIONAPP_PACKAGE_PATH }}'
34           python -m pip install --upgrade pip
35           pip install -r requirements.txt --target=".python_packages/lib/site-packages"
36           popd
37       - name: Upload artifact for deployment job
38         uses: actions/upload-artifact@v2
39         with:
40           name: python-app
41           path: |
42             .
43             !venv/
44   deploy:
45     runs-on: ubuntu-latest
46     needs: build
47     environment:
48       name: 'Production'
49     steps:
```

## Step 10 – Modify YAML file with Deploy definitions for Deploying the function app



```
40 name: python-app
41 path: |
42   .
43   !venv/
44 deploy:
45   runs-on: ubuntu-latest
46   needs: build
47   environment:
48     name: 'Production'
49   steps:
50     - name: 'Checkout GitHub action'
51       uses: actions/checkout@v2
52     - name: Setup Python ${{ env.PYTHON_VERSION }} Environment
53       uses: actions/setup-python@v1
54       with:
55         python-version: ${{ env.PYTHON_VERSION }}
56     - name: 'Resolve Project Dependencies Using Pip'
57       shell: bash
58       run: |
59         pushd './${{ env.AZURE_FUNCTIONAPP_PACKAGE_PATH }}'
60         python -m pip install --upgrade pip
61         pip install -r requirements.txt --target=".python_packages/lib/site-packages"
62         popd
63     - name: 'Run Azure Functions action'
64       uses: Azure/functions-action@v1
65       with:
66         app-name: ${{ env.AZURE_FUNCTIONAPP_NAME }}
67         package: ${{ env.AZURE_FUNCTIONAPP_PACKAGE_PATH }}
68         publish-profile: ${{ secrets.AZURE_FUNCTIONAPP_PUBLISH_PROFILE }}
```

## Step 11 - Execute Final Github Workflow for Publishing the complete Build and Deploy flow :



prasad05patil / greatlearning Public

Code Issues Pull requests **Actions** Projects Wiki Security Insights Settings

Build and deploy Python project to Azure Function App - CapstonePython1

Update capstonepython1.yml #3 Re-run all jobs

Summary

Jobs

- build
- deploy

Run details

- Usage
- Workflow file

Triggered via push 2 minutes ago

prasad05patil pushed · 2d40800 main

Status: Success

Total duration: 1m 18s

Artifacts: 1

capstonepython1.yml

on: push

build 25s → deploy 38s

Annotations

5 warnings



Actions · prasad05patil/greatlearn: x +

github.com/prasad05patil/greatlearning/actions

Search or jump to... Pull requests Issues Marketplace Explore

prasad05patil / greatlearning Public

Pin Unwatch 1 Fork 0 Star 0

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

### Actions

New workflow

All workflows

Build and deploy Python project to Azure ...

Management

Caches

### All workflows

Showing runs from all workflows

Filter workflow runs

6 workflow runs

	Event	Status	Branch	Actor
Update capstonepython1.yml	Build and deploy Python project to Azure Function App - CapstonePython1 #3: Commit 2a40800 pushed by prasad05patil	main	2 minutes ago 1m 18s	...
Add workflow	Build and deploy Python project to Azure Function App - CapstonePython1 #2: Commit 9dac661 pushed by prasad05patil	main	9 minutes ago 1m 27s	...

Update capstonepython1.yml · prasad05patil/greatlearning: x +

github.com/prasad05patil/greatlearning/actions/runs/3320479550/jobs/5486910757

prasad05patil / greatlearning Public

Pin Unwatch 1 Fork 0 Star 0

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Build and deploy Python project to Azure Function App - CapstonePython1

Update capstonepython1.yml #3

Re-run all jobs ...

### Summary

Jobs

- build
- deploy

Run details

Usage

Workflow file

### build

succeeded 2 minutes ago in 25s

Search logs

- Set up job 25s
- Checkout repository 15s
- Setup Python version 05s
- Create and start virtual environment 55s
- Install dependencies 15s
- Resolve Project Dependencies Using Pip 25s
- Upload artifact for deployment job 135s
- Post Checkout repository 05s
- Complete job 05s

The screenshot shows a GitHub Actions workflow run for the repository 'greatlearning/capstonepython1'. The workflow is named 'Update capstonepython1.yml #3' and has a status of 'succeeded'. The run was completed 2 minutes ago. The workflow steps are listed in a table:

Step	Duration
Set up job	35s
Checkout GitHub action	15s
Setup Python 3.9 Environment	8s
Resolve Project Dependencies Using Pip	7s
Run Azure Functions action	24s
Post Checkout GitHub action	8s
Complete job	8s

## Cost Analysis

Microsoft Azure Estimate						
Your Estimate						
Service category	Service type	Custom	Region	Description	Estimated monthly cost	Estimated upfront cost
Compute	Azure Functions		Central US	Consumption tier, Pay as you go, 128 MB memory, 300 milliseconds execution time, 5,2000 executions/mo	\$0.00	\$0.00
Support			Support		100 \$0.00	
			Licensing Program	Microsoft Customer Agreement (MCA)		
			Billing Account			
			Billing Profile			
			Total		100 \$0.00	
Disclaimer						
All prices shown are in United States – Dollar (\$) USD. This is a summary estimate, not a quote. For up to date pricing information please visit <a href="https://azure.microsoft.com/pricing/calculator/">https://azure.microsoft.com/pricing/calculator/</a>						
This estimate was created at 10/25/2022 11:58:54 AM UTC.						

## Github Pricing :

<b>Total estimated cost</b>	<b>\$21,000.00 /mo</b>
<b>Actions</b>	<b>\$0.00 /mo</b>
<b>GitHub Enterprise</b>	<b>\$21,000.00 /mo</b>



## GitHub Actions

Automate your workflow from idea to production.



### Select the runner type application

- ☒ **GitHub-managed Standard**  
2 cores machine with default GitHub images.
- ☐ **Self-hosted**  
Manage your runners if you have special hardware or networking needs.

### Select the operating system where you would like to run your jobs

GitHub-managed runners are based on Ubuntu Linux, Microsoft Windows, and macOS, and each job in a workflow runs in a fresh virtual environment.

- ☒ **Ubuntu Linux** \$0.48 /hr
- ☐ **Microsoft Windows** \$0.96 /hr
- ☐ **macOS** \$4.80 /hr

Number of jobs

500

/day

Duration of each job

15

minutes

## Plans



## GitHub Enterprise

Security, compliance and flexible deployment



Maximize developer agility and productivity. Developers can enjoy a fully-feature environment to build and innovate from idea to production. Work more collaboratively and efficiently anytime, anywhere, with secure open-source code repos and integrated code-to-cloud workflows.

### Number of seats

1000

Users

Cost per month

\$21,000.00