

Github Actions

-실습-

컴퓨터공학부
천세진

Outline

- Github Actions에 대한 개념적인 목적
- Github Actions에 대해 살펴보기
- STEP-UP



가장 기본적인 Github Actions

- Github 저장소에서
- 특정 이벤트(Event)가 발생하거나
 - 다수의 pull requests
- 작업(Task)의 시퀀스가 수행될 때
 - Compile, Testing, Deploy 등

이벤트/트리거(Trigger)의 예시

- Branch에 새로운 커밋이 발생
- 누군가 pull request를 open 혹은 edit
- 누군가 issue를 close
- 새로운 release 가 생성
- 또 다른 Github Action이 실행이 완료되었을때
- Manual triggering
- 아침 9시/저녁 12시마다

작업(Task)의 예시

- “regression tests”를 수행
- “Code coverage”를 계산
- “성능 측정(performance profiling)”
- 웹사이트 업데이트
- 새로운 릴리즈 준비
- 매뉴얼 생성
- 코드 포매팅(code formatting) 체크

Workflow란?

■ 워크플로우(Workflow)

- Task와 Configuration으로 구성된 단위(unit)

pylint

■ 워크플로우의 예시

- Pull request 가 생성되었을 때
 - regression tests 수행, 신규 코드가 test coverage를 확인
- 매일 아침 8시에
 - 소프트웨어를 릴리즈
- 새로운 릴리즈가 있을때,
 - 다운로드, 동작여부 확인, 웹사이트 업데이트

장점

- 자동화(Automation)은 시간이 절약
- 자동화는 일관성을 유지
- 자동화는 분권화와 투명성을 도움
- 컴퓨터 리소스에 요구사항을 감소
- 쉬운 설정을 제공

비용과 어려운 부분

- 셋업(Setup)에 시간이 걸림
- 가상화 머신은 좋은 컴퓨터가 아니다(Not supercomputer)
- 쉬운 설정 옵션은 끝이 없다(endless)
- 원격 머신(Remote machine)을 완전하게 통제하는 것은 어려움
- 영원하고 완벽한 세팅을 보장할 수 없다



Github Action

Continuous integration and continuous delivery
(CI/CD) platform

Github Action: release 과정을 위한 New, Powerful, Useful 도구

■ 경쟁 서비스

- AppVeyor
- Azure Pipeline
- Jenkins
- Travis (x)

■ 본 수업은 기본적인 과정만을 배웁니다.


- 생성하려는 서비스의 워크플로우에 따라 특정 CI/CD 플랫폼에 상당하게 의존하기 때문

Github Action01 동작단계




- 워크플로우는 YAML 파일로
 - .github/workflows에 있음
- 구조는
 - Configuration options
 - Sequences of actions
- GitHub는 워크플로우를 추적 및 실행함
- 그 결과는 Github의 Action 탭에 보여짐


Github에서 Github Actions 살펴보기


워크플로우 디렉토리





[Pulls](#) [Issues](#) [Codespaces](#) [Marketplace](#) [Explore](#)


  

 [pandas-dev / pandas](#) Public


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 [Star](#) 36.9k

[Code](#) [Issues](#) 3.6k [Pull requests](#) 152 [Actions](#) [Projects](#) 1 [Security](#) [Insights](#)

 [main](#) [pandas / .github / workflows /](#) [Go to file](#) [Add file](#) [...](#)


 [mroeschke](#) TST/CLN: Remove --skip-* flags in favor of -m "not *" (#51490) [...](#) ✖ 6 hours ago [History](#)








..

 32-bit-linux.yml	CI: Cancel 32 bit when another job is started (#51465)	3 days ago
 assign.yml	Alternate Ubuntu CI fix (#50117)	2 months ago
 asv-bot.yml	Alternate Ubuntu CI fix (#50117)	2 months ago
 autoupdate-pre-commit-config.yml	Alternate Ubuntu CI fix (#50117)	2 months ago
 code-checks.yml	CI make some more hooks manual (#50188)	2 months ago
 codeql.yml	CI: Make some builds contents read only (#50566)	last month

워크플로우 파일

main ▾ [pandas](#) / [.github](#) / [workflows](#) / 32-bit-linux.yml View runs Go to file ...

 **phofl** CI: Cancel 32 bit when another job is started (#51465) ... ✖ Latest commit 1beec62 3 days ago 🕒 History


👤 7 contributors       

58 lines (53 sloc) | 2.17 KB Raw Blame ✎ ▾ 📄 🗑️


```
1  name: 32 Bit Linux
2
3  on:
4    push:
5      branches:
6        - main
7        - 1.5.x
8    pull_request:
9      branches:
10       - main
```





Action Tab


 pandas-dev / pandas

Public


 Sponsor


 Watch 1.1k


 Fork 15.8k


 Star 36.9k


<> Code


 Issues 3.6k

 Pull requests 152

 Actions

 Projects 1

 Security

 Insights

Actions

All workflows

32 bit builds

32 Bit Linux

Assign

ASV Bot

CI

Code Checks

CodeQL

CodeQL

All workflows

Showing runs from all workflows


331,008 workflow runs



Event


Status



Branch

Actor

 Floating point precision in DataFra...
Assign #81042: Issue comment #2069 (comment)
created by jiahe224


 2 minutes ago ...
 13s





 Floating point precision in DataFra...
ASV Bot #27209: Issue comment #2069 (comment)
created by jiahe224








 2 minutes ago ...
 2s



Action Tab: 모든 종류의 Actions

 pandas-dev / pandas Public

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 Code  Issues 3.6k  Pull requests 152  Actions  Projects 1  Security  Insights

Actions

- All workflows
- 32 bit builds
- 32 Bit Linux
- Assign
- ASV Bot
- CI
- Code Checks
- CodeQL
- CodeQL

All workflows

Showing runs from all workflows







331,008 workflow runs

Event ▾

Status ▾


Branch ▾

Actor ▾


	Floating point precision in DataFra... Assign #81042: Issue comment #2069 (comment) created by jiahe224	 2 minutes ago ...  13s
	Floating point precision in DataFra... ASV Bot #27209: Issue comment #2069 (comment) created by jiahe224	 2 minutes ago ...  2s





Action Tab: 수행한 워크플로우


 pandas-dev / pandas

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<> Code


 Issues 3.6k

 Pull requests 152

 Actions

 Projects 1

 Security

 Insights

Actions

All workflows

32 bit builds

32 Bit Linux

Assign

ASV Bot

CI

Code Checks

CodeQL

CodeQL

All workflows

Showing runs from all workflows


331,008 workflow runs



Event ▾


Status ▾



Branch ▾

Actor ▾

 Floating point precision in DataFra...
Assign #81042: Issue comment #2069 (comment)
created by jiahe224


 2 minutes ago ...
 13s

 Floating point precision in DataFra...
ASV Bot #27209: Issue comment #2069 (comment)
created by jiahe224


 2 minutes ago ...
 2s





Action Tab: 특정 워크플로우 확인


 pandas-dev / pandas

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 Watch 1.1k


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 Star 36.9k


<> Code


 Issues 3.6k

 Pull requests 152


 Actions


 Projects 1


 Security

 Insights


← 32 Bit Linux

 DOC: Updating the timedeltas.seconds docstring for Issue #50969 #13903





 Summary

Jobs

 pytest


Run details

 Usage

 Workflow file

Triggered via pull request 2 hours ago

Status

 rmhowe425 opened #51522 [rmhowe425:richard/dev](#) **Success**

Total duration


Artifacts

1h 4m 30s

—

32-bit-linux.yml

on: pull_request



컴퓨터시공학부

18

동아대학교

Action Tab: 세부 실행계획 확인

← 32 Bit Linux

✓ DOC: Updating the timedeltas.seconds docstring for Issue #50969 #13903

...

Summary

Jobs

✓ pytest

Run details

Usage

Workflow file

pytest

succeeded 1 hour ago in 39m 41s

Search logs

⚙

> ✓ Set up job

1s

> ✓ Checkout

31s

> ✓ Run 32-bit manylinux2014 Docker Build / Tests

39m 8s

⌚ Publish test results for Python 3.8-32 bit full Linux

0s

> ✓ Post Checkout


0s



> ✓ Complete job


0s




Pull request에서 확인













 Open DOC: Updating the timedeltas.seconds docstring for Issue #50969 #51522
rmhowe425 wants to merge 1 commit into `pandas-dev:main` from `rmhowe425:richard/dev` 


  rmhowe425 changed the title ~~Updating the timedeltas.seconds docstring for Issue #50969~~ DOC: Updating the timedeltas.seconds docstring for Issue #50969 1 hour ago



 **Some checks were not successful** [Hide all checks](#)

4 skipped, 33 successful, 2 failing, and 5 in progress checks

 	Package Checks / Install Extras - <code>\${{ matrix.extra }}</code> (pull_re...	Details
 	Wheel builder / Build wheel for <code>\${{ matrix.python[0] }}</code> - <code>\${{ ...</code>	Details
 	sdist / build (pull_request) Skipped	Details
 	32 Bit Linux / pytest (pull_request) Successful in 39m	Details
 	Code Checks / pre-commit (pull_request) Successful in 2m	Details
 	Doc Build and Upload / Doc Build and Upload (pull_reque...	Details

 **This branch has no conflicts with the base branch**
Only those with [write access](#) to this repository can merge pull requests.

None yet

Projects


None yet

Milestone


No milestone

Development

Successfully merging this pull request may close these issues.

 DOC: seconds attribute of timedelta surpr...

Notifications [Customize](#)

 [Subscribe](#)

You're not receiving notifications from this thread.

1 participant



Check Tab: Pull request 별 워크플로우 수행결과 확인

DOC: Updating the timedeltas.seconds docstring for Issue #50969 #51522

<> Code ▾

Open

rmhowe425 wants to merge 1 commit into pandas-dev:main from rmhowe425:richard/dev



Conversation 0



Commits 1



Checks 39



Files changed 1

+5 -0



Updating the timedeltas.seconds docstring for Issue #50969 bf8259e ▾

Artifacts 1 ▾



Doc Build and Upload

on: pull_request



5



Doc Build and Upload



Package Checks

on: pull_request



32 Bit Linux

on: pull_request

Doc Build and Upload

succeeded 40 minutes ago in 1h 18m 55s



Set up job

2s



Checkout

28s



Set up Conda

1m 54s



Build Pandas

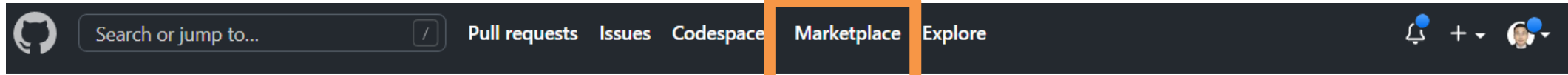
8m 15s



Search logs



Check Tab: 마켓플레이스에서 기존의 Actions 재사용



[Marketplace](#) / Search results

Types

Apps

Actions

Categories

API management

Chat

Code quality

Code review

Continuous integration

Dependency management

Deployment

IDEs

Search for apps and actions

Sort: Best Match

Actions

An entirely new way to automate your development workflow.

17224 results filtered by Actions

Actions



Setup Go environment

By actions

Setup a Go environment and add it to the PATH

☆ 983 stars



Download a Build Artifact

By actions

Download a build artifact that was previously uploaded in the workflow by the upload-artifact action

☆ 874 stars



Setup .NET Core SDK

By actions

Used to build and publish .NET source. Set up a specific version of the .NET and authentication to private NuGet repository

☆ 704 stars



Setup Java JDK

By actions

Set up a specific version of the Java JDK and add the command-line tools to the PATH

☆ 1k stars

Building Your Github Action

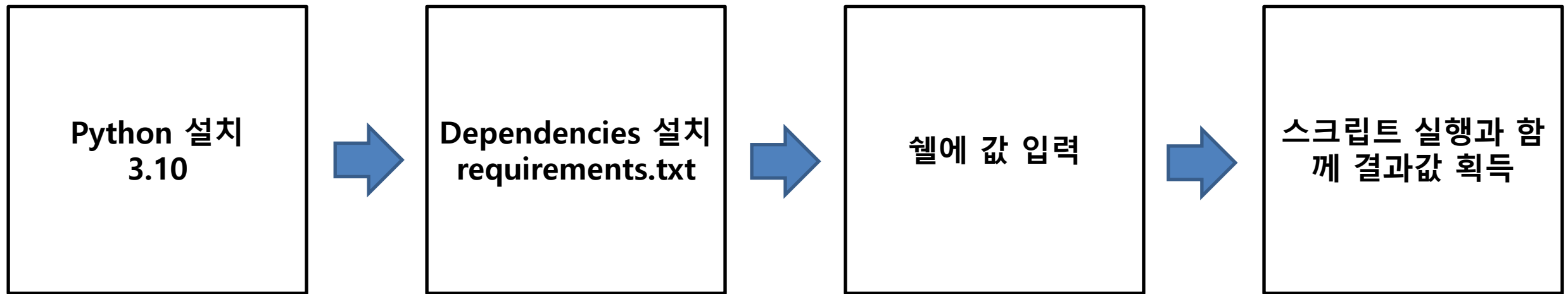
참고: <https://shipyard.build/blog/your-first-python-github-action/>

새로운 Github repository 생성

- 프로젝트 이름은 자유롭게
- MIT License



Workflow




Workflow : Python 설치

- uses
- with

Python 설치
3.10

Marketplace / Actions / Setup Python



GitHub Action

Setup Python

v4.5.0 Latest version

Use latest version

setup-python

Basic validation passing

Validate Python e2e passing

Validate PyPy e2e passing

e2e-cache failing

This action provides the following functionality for GitHub Actions users:

- Installing a version of Python or PyPy and (by default) adding it to the PATH
- Optionally caching dependencies for pip, pipenv and poetry
- Registering problem matchers for error output

Basic usage

See [action.yml](#)

Verified creator


GitHub has verified that this action was created by **actions**.

[Learn more about verified Actions.](#)

Stars

☆ Star 1.1k

Contributors



```
- name: Install Python
  uses: actions/setup-python@v4
  with:
    python-version: '3.10'
```

Workflow : Dependencies 설치

■ run

Dependencies 설치
requirements.txt

```
- name: Install Dependencies  
  run: pip install -r requirements.txt
```

Workflow : 셸에 값 입력

■ run

셸에 값 입력

```
- name: Pass Inputs to Shell  
  run: |  
    echo "INPUT_NUM=${{ inputs.num }}" >> $GITHUB_ENV
```

Workflow : 스크립트 실행과 함께 결과값 획득

■ run

스크립트 실행과 함
께 결과값 획득

```
- name: Fetch the number's square  
  run: python src/get_num_square.py
```

```

1  # action.yaml
2  name: 'Custom GitHub Action'
3  description: 'A GitHub Action that takes an input and returns the square of the number'
4  inputs:
5    num:
6      description: 'Enter a number'
7      required: true
8      default: "1"
9  outputs:
10   num_squared:
11     description: 'Square of the input'
12     # need to specify the extra `value` field for `composite` actions
13     value: ${ steps.get-square.outputs.num_squared }
14  runs:
15    using: 'composite'
16    steps:
17      - name: Install Python
18        uses: actions/setup-python@v4
19        with:
20          python-version: '3.10'
21      - name: Install Dependencies
22        run: pip install -r requirements.txt
23        shell: bash
24      - name: Pass Inputs to Shell
25        run: |
26          echo "INPUT_NUM=${ inputs.num }" >> $GITHUB_ENV
27        shell: bash
28      - name: Fetch the number's square
29        id: get-square
30        run: python src/get_num_square.py
31        shell: bash

```

action.yml



get_num_square.py 코드 작성

```
1  # src/get_num_square.py
2  import os
3
4  # get the input and convert it to int
5  num = os.environ.get("INPUT_NUM")
6  if num:
7      try:
8          num = int(num)
9      except Exception:
10         exit('ERROR: the INPUT_NUM provided ("{}") is not an integer'.format(num))
11 else:
12     num = 1
13
14 # to set output, print to shell in following syntax
15 print(f"::set-output name=num_squared::{num ** 2}")
```



Github Actions

<> Code Issues Pull requests Actions Projects Security Insights Settings

github-action-python-template / .github / workflows / main.yml in main

<> Edit new file

Preview

Spaces

2

No wrap

```
1 name: Test Action
2 on: [push]
3
4 jobs:
5   get-num-square:
6     runs-on: ubuntu-latest
7     name: Returns the number square
8     steps:
9       - name: Checkout
10         uses: actions/checkout@v2
11       - name: Fetch num squared
12         id: get_square
13         uses: ./ # Uses an action in the root directory
14         with:
15           num: 11
16       - name: Print the square
17         run: echo "${{ steps.get_square.outputs.num_squared }}"
```

Use Control + Space to trigger autocomplete in most situations.

Cancel changes

Start commit

Marketplace

Documentation

Search Marketplace for Actions

Featured Actions



Cache

By actions

3.5k

Cache artifacts like dependencies and build outputs to improve workflow execution time



Upload a Build Artifact

By actions

2.1k

Upload a build artifact that can be used by subsequent workflow steps



Setup Go environment

By actions

983

Setup a Go environment and



Actions에서 수행과정 확인

<> Code

Issues

Pull requests

Actions

Projects

Security

Insights

Settings

Actions

New workflow

All workflows

Test Action

Management

Caches

All workflows

Showing runs from all workflows

1 workflow run

Event ▾

Status ▾

Branch ▾

Actor ▾

✖

Create main.yml

main

Test Action #1: Commit a7616e6 pushed by chunsejin

📅 now

🕒 20s

...

오류 원인파악 및 해결

- 해당 오류에 대한 원인, 오류 해결방안 파악

STEP UP

간단한 CI/CD 파이프라인 및 자동 문법 검사 구축하기

- Python 코드의 문법적 오류와 코드 스타일 문제를 자동으로 검사해주는 정적 분석 도구
 - 코드 품질을 높이고 일관된 코딩 스타일을 유지
- <https://github.com/pycqa/flake8>

절차

- 저장소 만들기
- 로컬에서 프로젝트 준비하기
- 테스트 파일 생성하기
- GitHub Actions 설정하기
- GitHub에 Push 및 결과 확인하기

절차

- 저장소 만들기
 - GitHub에서 새로운 저장소를 생성
- 로컬에서 프로젝트 준비하기
 - 간단한 Python 파일 생성 (예: calculator.py)
- 테스트 파일 생성하기
- GitHub Actions 설정하기
- GitHub에 Push 및 결과 확인하기

로컬에서 프로젝트 준비하기

- 간단한 Python 파일 생성 (예: calculator.py)

```
1 # calculator.py
2
3 def multiply(a, b):
4     return a * b
5
6 if __name__ == '__main__':
7     print(multiply(3, 4))
```



테스트 파일 생성하기

- 테스트를 위한 Python 파일 생성 (test_calculator.py)

```
1 # test_calculator.py
2 from calculator import multiply
3
4 def test_multiply():
5     |   assert multiply(2, 3) == 6
```


GitHub Actions 설정하기

- 프로젝트 폴더
에 .github/workflows 디렉터리를 생성
- 해당 디렉터리에 ci.yml 파일 생성 후 아래 내용 작성

```
1 name: Python CI
2
3 on:
4   push:
5     branches:
6       - main
7   pull_request:
8     branches:
9       - main
10
11 jobs:
12   build:
13     runs-on: ubuntu-latest
14
15     steps:
16       - uses: actions/checkout@v4
17       - name: Set up Python
18         uses: actions/setup-python@v5
19         with:
20           python-version: '3.10'
21       - name: Install dependencies
22         run: |
23           python -m pip install --upgrade pip
24           pip install pytest flake8
25       - name: Lint with flake8
26         run: |
27           flake8 . --count --select=E9,F63,F7,F82 --show-source --statistics
28       - name: Run tests
29         run: |
30           pytest
```

GitHub Actions 설정하기

- 프로젝트 폴더
에 .github/workflows 디
렉터리를 생성
- 해당 디렉터리에 ci.yml 파
일 생성 후 아래 내용 작성

```
1 name: Python CI
2
3 on:
4   push:
5     branches:
6       - main
7   pull_request:
8     branches:
9       - main
10
11 jobs:
12   build:
13     runs-on: ubuntu-latest
14
15     steps:
16       - uses: actions/checkout@v4
17       - name: Set up Python
18         uses: actions/setup-python@v5
19         with:
20           python-version: '3.10'
21       - name: Install dependencies
22         run: |
23           python -m pip install --upgrade pip
24           pip install pytest flake8
25       - name: Lint with flake8
26         run: |
27           flake8 . --count --select=E9,F63,F7,F82 --show-source --statistics
28       - name: Run tests
29         run: |
30           pytest
```