Introduction to GitHub Actions

GitHub Actions

Automation platform integrated into GitHub

Used to create custom, automated software development workflows

Saves time and increases productivity

Workflows

Defined as a YAML file (*.yml or *.yaml)

Text files with indented, hierarchical format of colon-separated key-value pairs

Stored in GitHub repository at **.github/workflows/**

```
name: Workflow Demo
on: push
jobs:
  Hello-World-Python-Demo:
    strategy:
      matrix:
        python-version: ['3.6', '3.7', '3.8']
    runs-on: ubuntu-latest
```

Building GitHub Actions

```
1  on: push
2  jobs:
     check-python-version:
       runs-on: ubuntu-latest
   3   steps:
         - uses: actions/checkout@v2
         - uses: actions/setup-python@v2
         - run: python -V
```

How does GitHub Actions work?

1) an event triggers a workflow
2) the workflow contains a job
3) the job contains steps of
   actions that will run in a
   specified order

Trigger workflows anywhere in your development lifecycle

Such as when:
an issue is opened
a pull request is made
code is pushed to a certain branch
& more

Can also set up workflows to run on a schedule, or manually

Actions

Actions power your workflows

Jobs consolidate steps that contain one or more actions

Examples:
Check out a repository
Set up a Python environment
Send an email notification
Run an automated test
Push code to another repository
& more

```
on: push
jobs:
  check-python-version:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v2
      - uses: actions/setup-python@v2
      - run: python -V
```

Actions Marketplace

Create custom actions or use community-created actions from the Actions Marketplace

Many actions already available to use

https://github.com/marketplace (choose Actions category)

Marketplace   Documentation

Search Marketplace for Actions

Featured Actions

Cache
By actions ✓
⭐ 2.3k
Cache artifacts like dependencies and build outputs to improve workflow execution time

Setup Node.js environment
By actions ✓
⭐ 1.5k
Setup a Node.js environment by adding problem matchers and optionally downloading and adding it to the PATH

Setup Java JDK
By actions ✓
⭐ 552
Set up a specific version of the Java JDK and add the command-line tools to the PATH

Download a Build Artifact
By actions ✓
⭐ 445
Download a build artifact that was previously uploaded in the workflow by the upload-artifact action

First interaction
By actions ✓
⭐ 156
Greet new contributors when they create their first issue or open their first pull request

Test software across multiple platforms

Review results after actions are completed to check for failures

Review results