GitHub Actions Continuous Delivery 101

ScaleUp 360° Continuous Delivery Europe

Lothar Schulz

2020 07 10

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REACHNOW

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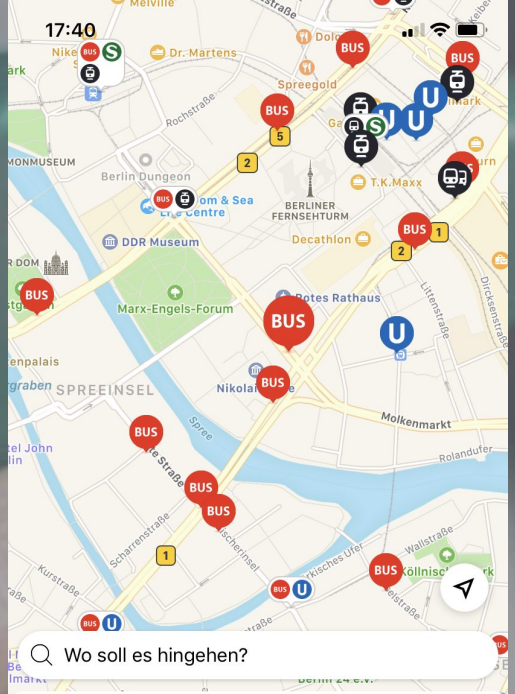
REACHNOW



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Me

Engineering Manager

lotharschulz.info

github.com/lotharschulz

speakerdeck.com/lothar

@lothar_schulz

lnkd.in/lotharschulz

CI/CD Meetup Berlin

medium.com/reachnow-tech

GitHub Actions

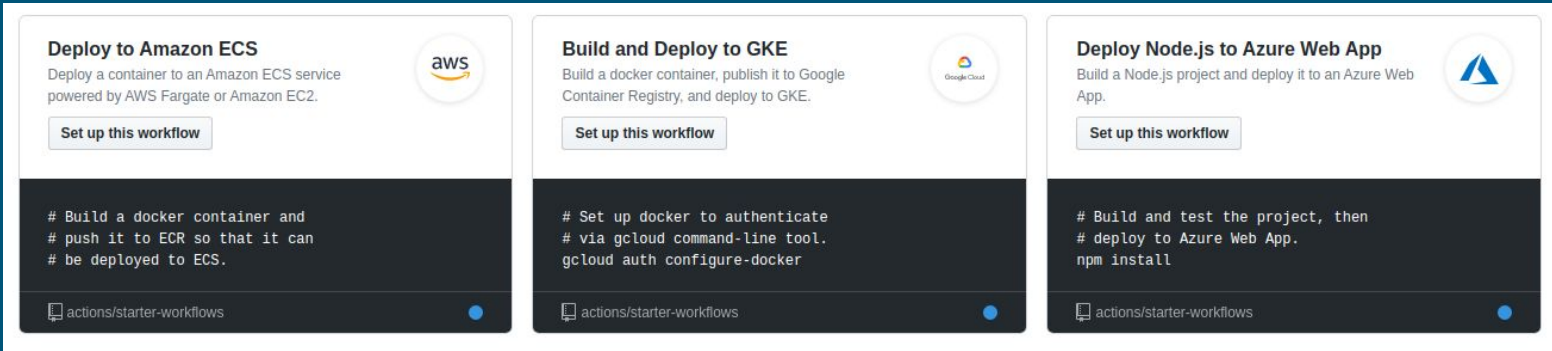
Workflow Automation

GitHub Actions

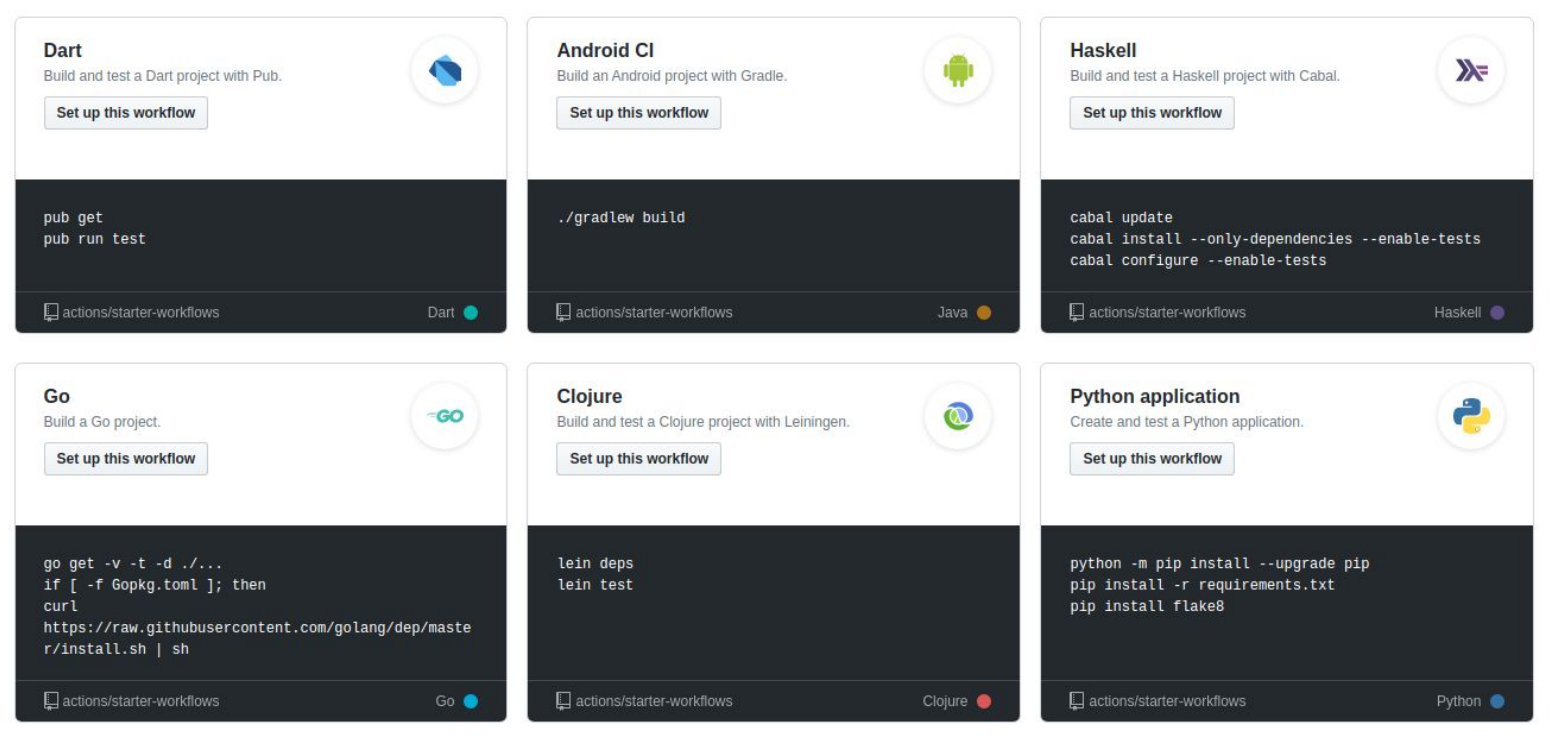
Built-in CI/CD

What are GitHub Actions?

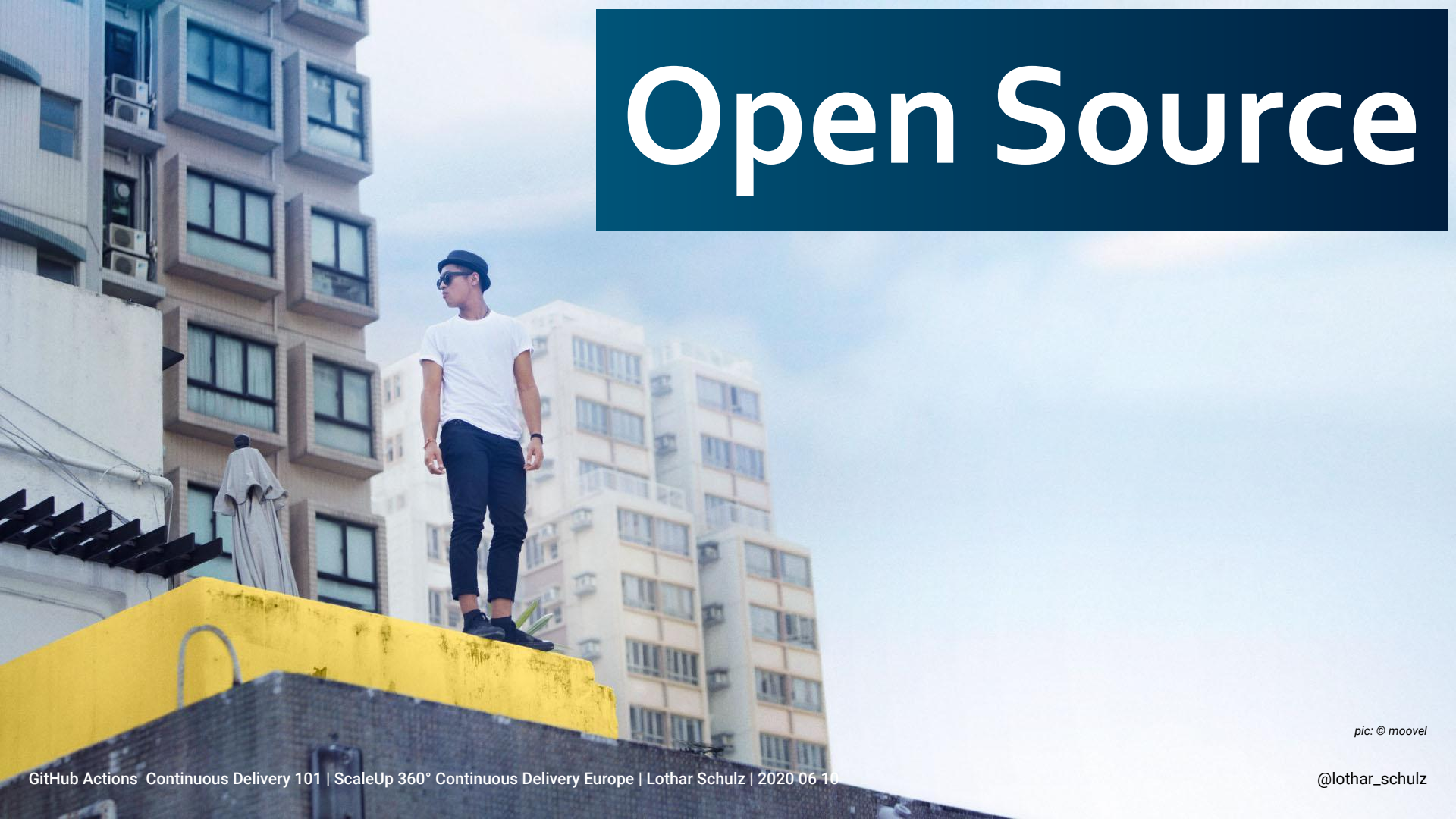
With GitHub Actions, workflows and steps are just code in a repository, so you can create, share, reuse, and fork your software development practices.



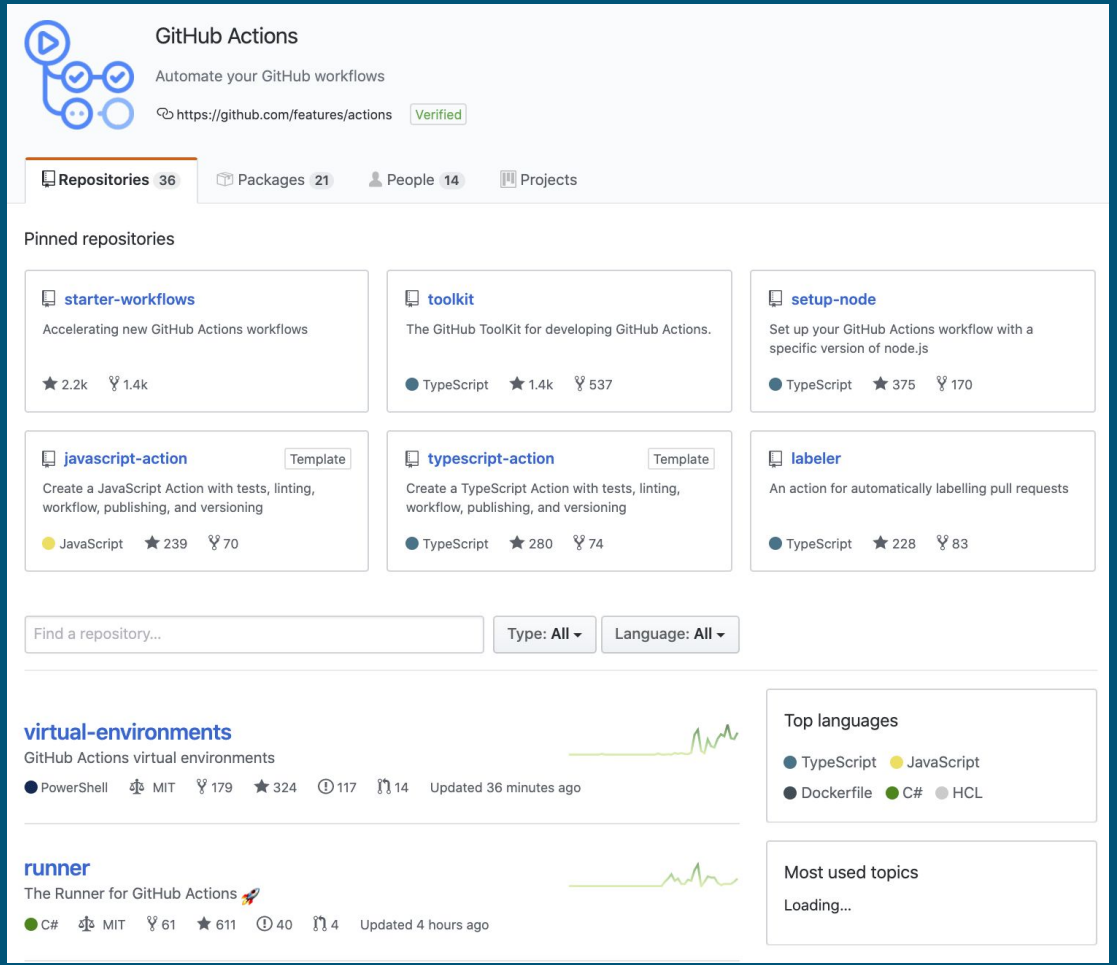
https://github.blog/2019-08-08-github-actions-now-supports-ci-cd/


Dart
Build and test a Dart project with Pub.
Set up this workflow
pub get
pub run test
actions/starter-workflows
Dart
Android CI
Build an Android project with Gradle.
Set up this workflow
./gradlew build
actions/starter-workflows
Java
Haskell
Build and test a Haskell project with Cabal.
Set up this workflow
cabal update
cabal install --only-dependencies --enable-tests
cabal configure --enable-tests
actions/starter-workflows
Haskell
Go
Build a Go project.
Set up this workflow
go get -v -t -d ./...
if [-f Gopkg.toml]; then
curl
https://raw.githubusercontent.com/golang/dep/master/install.sh | sh
actions/starter-workflows
Go
Clojure
Build and test a Clojure project with Leiningen.
Set up this workflow
lein deps
lein test
actions/starter-workflows
Clojure
Python application
Create and test a Python application.
Set up this workflow
python -m pip install --upgrade pip
pip install -r requirements.txt
pip install flake8
actions/starter-workflows
Python

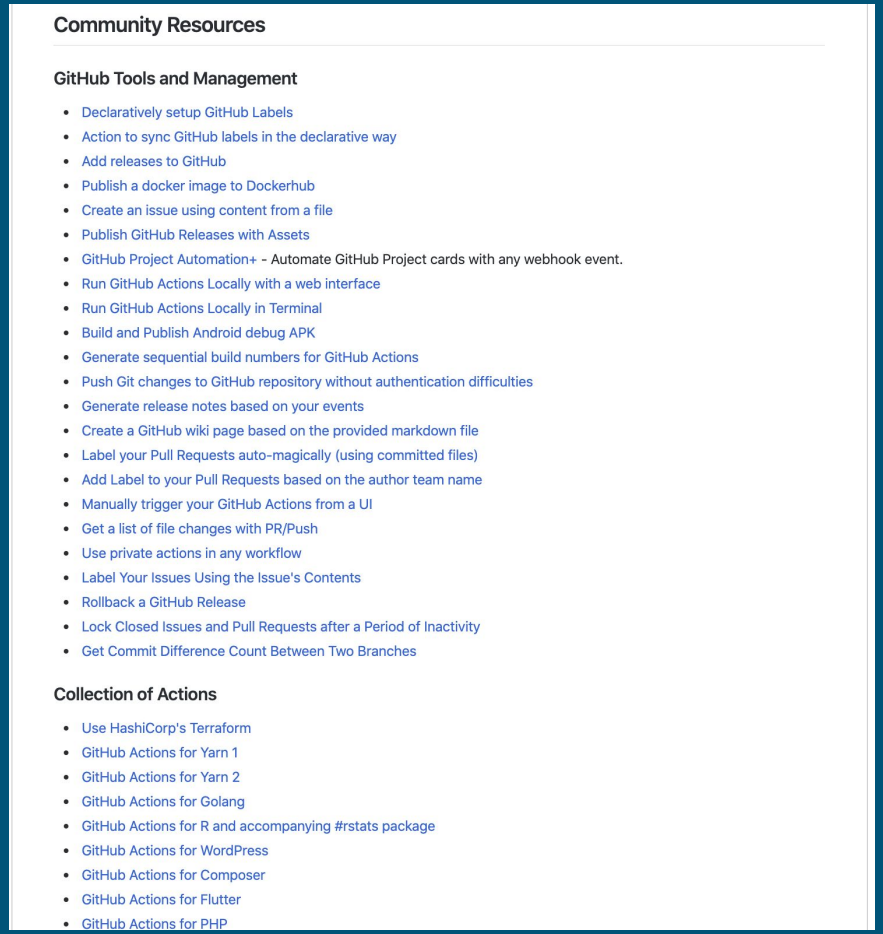
Open Source



pic: © moovel



github.com/actions



Community Resources

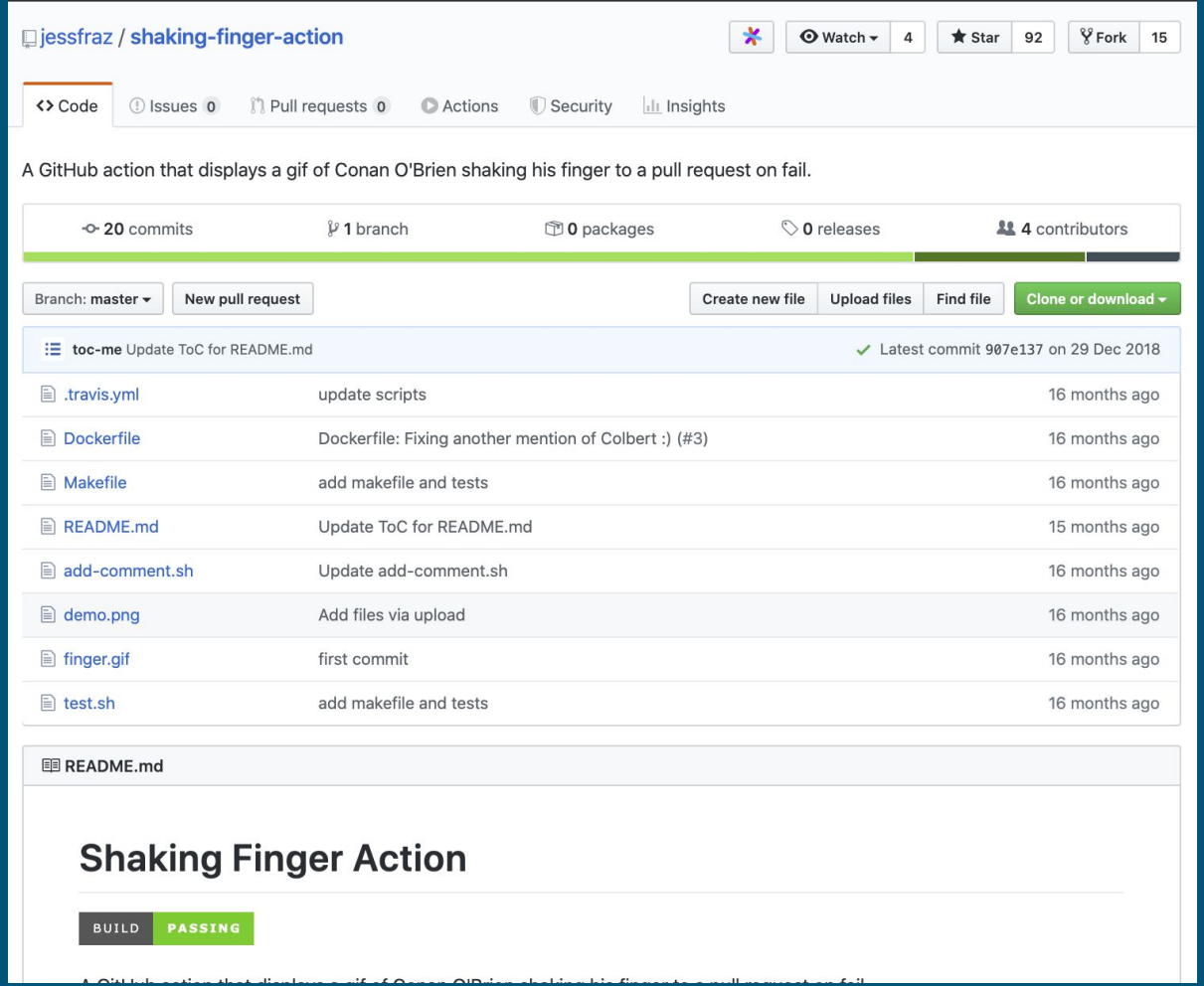
GitHub Tools and Management

- Declaratively setup GitHub Labels
- Action to sync GitHub labels in the declarative way
- Add releases to GitHub
- Publish a docker image to Dockerhub
- Create an issue using content from a file
- Publish GitHub Releases with Assets
- GitHub Project Automation+ - Automate GitHub Project cards with any webhook event.
- Run GitHub Actions Locally with a web interface
- Run GitHub Actions Locally in Terminal
- Build and Publish Android debug APK
- Generate sequential build numbers for GitHub Actions
- Push Git changes to GitHub repository without authentication difficulties
- Generate release notes based on your events
- Create a GitHub wiki page based on the provided markdown file
- Label your Pull Requests auto-magically (using committed files)
- Add Label to your Pull Requests based on the author team name
- Manually trigger your GitHub Actions from a UI
- Get a list of file changes with PR/Push
- Use private actions in any workflow
- Label Your Issues Using the Issue's Contents
- Rollback a GitHub Release
- Lock Closed Issues and Pull Requests after a Period of Inactivity
- Get Commit Difference Count Between Two Branches

Collection of Actions

- Use HashiCorp's Terraform
- GitHub Actions for Yarn 1
- GitHub Actions for Yarn 2
- GitHub Actions for Golang
- GitHub Actions for R and accompanying #rstats package
- GitHub Actions for WordPress
- GitHub Actions for Composer
- GitHub Actions for Flutter
- GitHub Actions for PHP

github.com/sdras/awesome-actions#community-resources



github.com/jessfraz/shaking-finger-action

Open Source Projects using GitHub actions (incomplete list)

- https://github.com/gatsbyjs/gatsby/tree/master/.github/workflows
- https://github.com/hakimel/reveal.js/blob/master/.github/workflows/js.yml
- https://github.com/twbs/bootstrap/blob/master/.github/workflows/test.yml
- https://github.com/microsoft/vscode/tree/master/.github/workflows
- https://github.com/facebook/create-react-app/tree/master/.github/workflows
- https://github.com/hakimel/reveal.js/blob/master/.github/workflows/js.yml
- https://github.com/babel/babel/tree/master/.github/workflows
- https://github.com/nodejs/node/tree/master/.github/workflows
- https://github.com/microsoft/TypeScript/tree/master/.github/workflows
- https://github.com/kubernetes/utils/tree/master/.github/workflows
- https://github.com/jonico/programmatic-runner-test/blob/master/.github/workflows/blank.yml

How To's

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Matrix - Builds on Linux, macOS, Windows

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14, ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
runs-on: ${{ matrix.os }}
```

Matrix - Excludes

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14, ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
runs-on: ${{ matrix.os }}
```

```
exclude:
   - os: macOS-10.14
     goos: linux
   - os: ubuntu-18.04
      goos: darwin
```

Matrix - Includes & Excludes

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14, ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
runs-on: ${{ matrix.os }}
```

```
exclude:
   - os: macOS-10.14
     goos: linux
   - os: ubuntu-18.04
      goos: darwin
```

```
include:
  - os: macOS-10.14
    goos: darwin
  - os: ubuntu-18.04
    goos: linux
```

Matrix - Includes & Excludes

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14, ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
runs-on: ${{ matrix.os }}
```

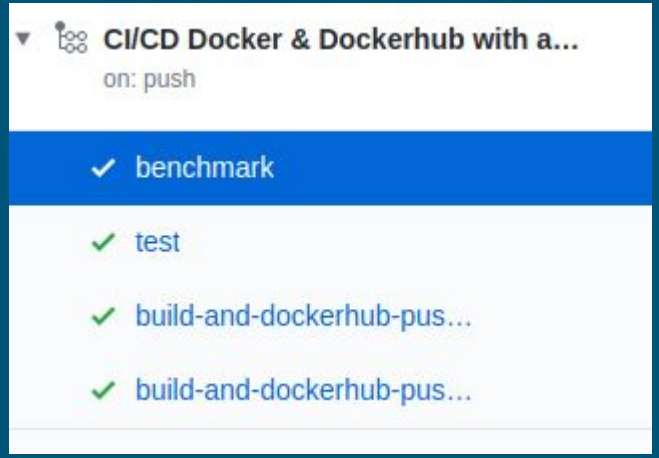
```
exclude:
   - os: macOS-10.14
     goos: linux
   - os: ubuntu-18.04
      goos: darwin
```

```
include:
  - os: macOS-10.14
    goos: darwin
  - os: ubuntu-18.04
    goos: linux
```

Jobs

Jobs can run at the same time in parallel or be dependent on the status of a previous job and run sequentially.

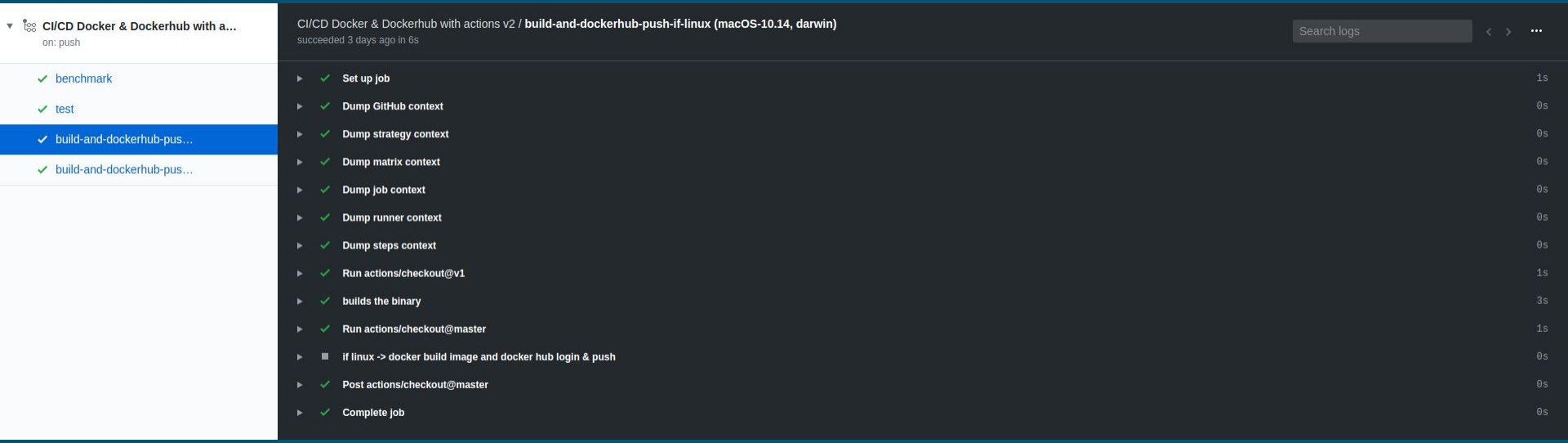
```
build-and-dockerhub-push-if-linux:
  needs: [benchmark, test]
```



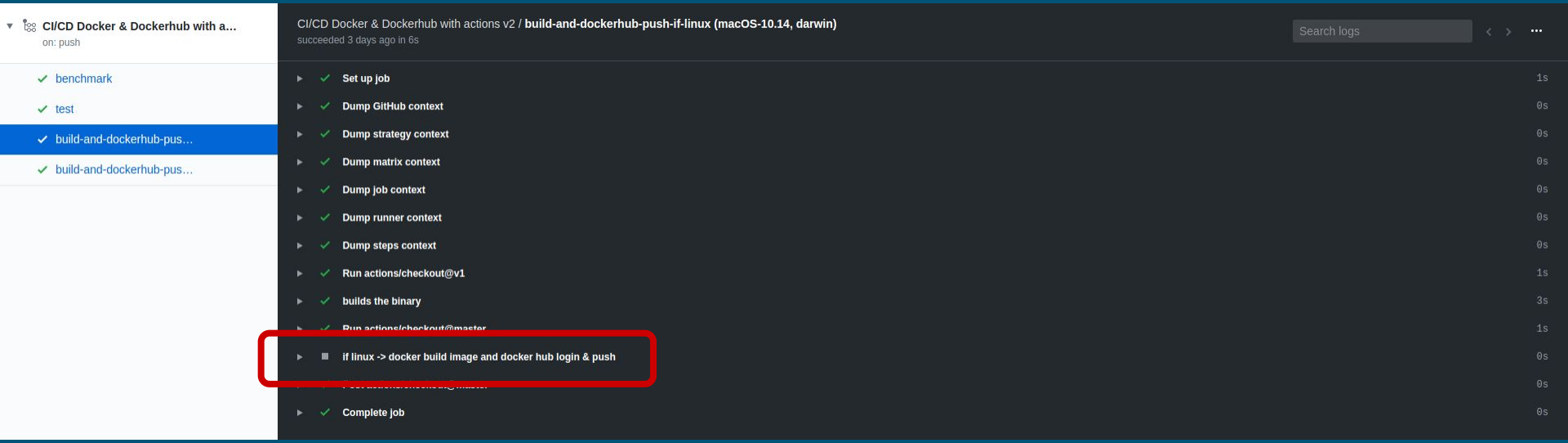
Conditionals

```
if: matrix.os == 'ubuntu-18.04'
env:
  DOCKER_USERNAME: ${{ secrets.DOCKER_USERNAME }}
  DOCKER_PASSWORD: ${{ secrets.DOCKER_PASSWORD }}
run: |
  d=$(date +%Y-%m-%d)
  tag=$d-${{ matrix.os }}-${{ github.sha }}
  docker build -t lotharschulz/hello-github-actions:$tag .
  docker login -u ${DOCKER_USERNAME} -p ${DOCKER_PASSWORD}
  docker push lotharschulz/hello-github-actions:$tag
```

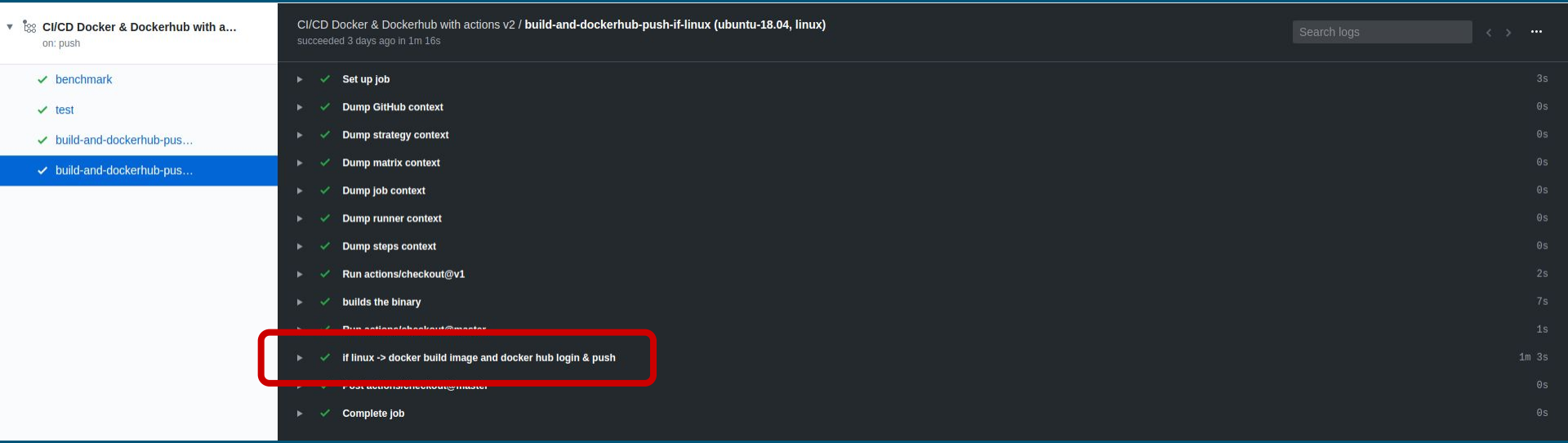
Matrix


CI/CD Docker & Dockerhub with a…
on: push
benchmark
test
build-and-dockerhub-pus…
build-and-dockerhub-pus…
CI/CD Docker & Dockerhub with actions v2 / build-and-dockerhub-push-if-linux (macOS-10.14, darwin)
succeeded 3 days ago in 6s
Search logs
Set up job 1s
Dump GitHub context 0s
Dump strategy context 0s
Dump matrix context 0s
Dump job context 0s
Dump runner context 0s
Dump steps context 0s
Run actions/checkout@v1 1s
builds the binary 3s
Run actions/checkout@master 1s
if linux -> docker build image and docker hub login & push 0s
Post actions/checkout@master 0s
Complete job 0s

Matrix

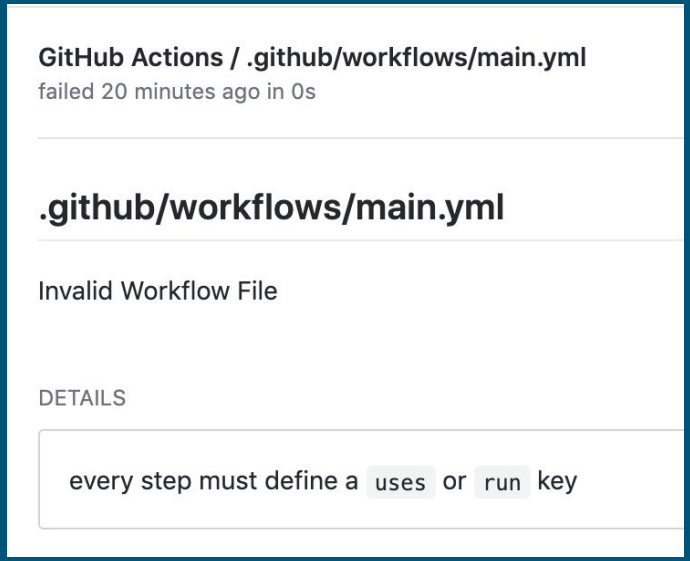

CI/CD Docker & Dockerhub with a…
on: push
benchmark
test
build-and-dockerhub-pus…
build-and-dockerhub-pus…
CI/CD Docker & Dockerhub with actions v2 / build-and-dockerhub-push-if-linux (macOS-10.14, darwin)
succeeded 3 days ago in 6s
Search logs
Set up job 1s
Dump GitHub context 0s
Dump strategy context 0s
Dump matrix context 0s
Dump job context 0s
Dump runner context 0s
Dump steps context 0s
Run actions/checkout@v1 1s
builds the binary 3s
Run actions/checkout@master 1s
if linux -> docker build image and docker hub login & push 0s
0s
Complete job 0s

Matrix


CI/CD Docker & Dockerhub with a…
on: push
benchmark
test
build-and-dockerhub-pus…
build-and-dockerhub-pus…
CI/CD Docker & Dockerhub with actions v2 / build-and-dockerhub-push-if-linux (ubuntu-18.04, linux)
succeeded 3 days ago in 1m 16s
Search logs
Set up job 3s
Dump GitHub context 0s
Dump strategy context 0s
Dump matrix context 0s
Dump job context 0s
Dump runner context 0s
Dump steps context 0s
Run actions/checkout@v1 2s
builds the binary 7s
1s
if linux -> docker build image and docker hub login & push 1m 3s
0s
Complete job 0s

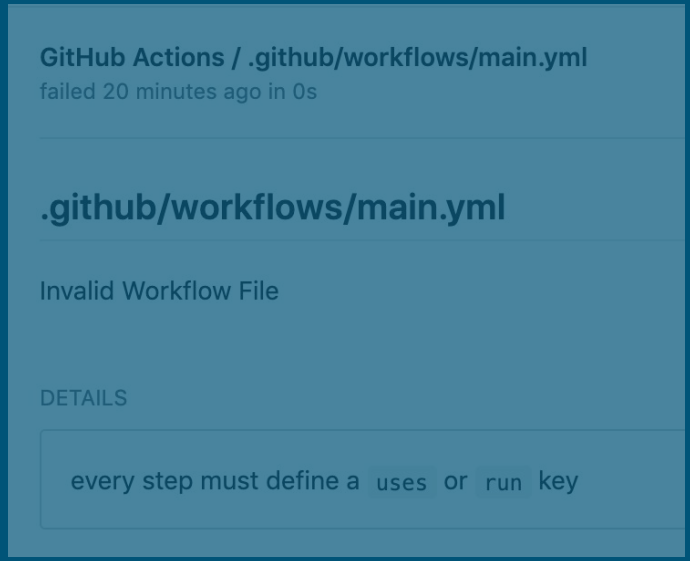
Surprises

```
test:
 runs-on: ubuntu-18.04
 steps:
 - uses: actions/checkout@v1
 - uses: actions/setup-java@v1
   with:
     java-version: 11
 - uses: eskatos/gradle-command-action@v1
   with:
     arguments: test
 - name: test the code
```



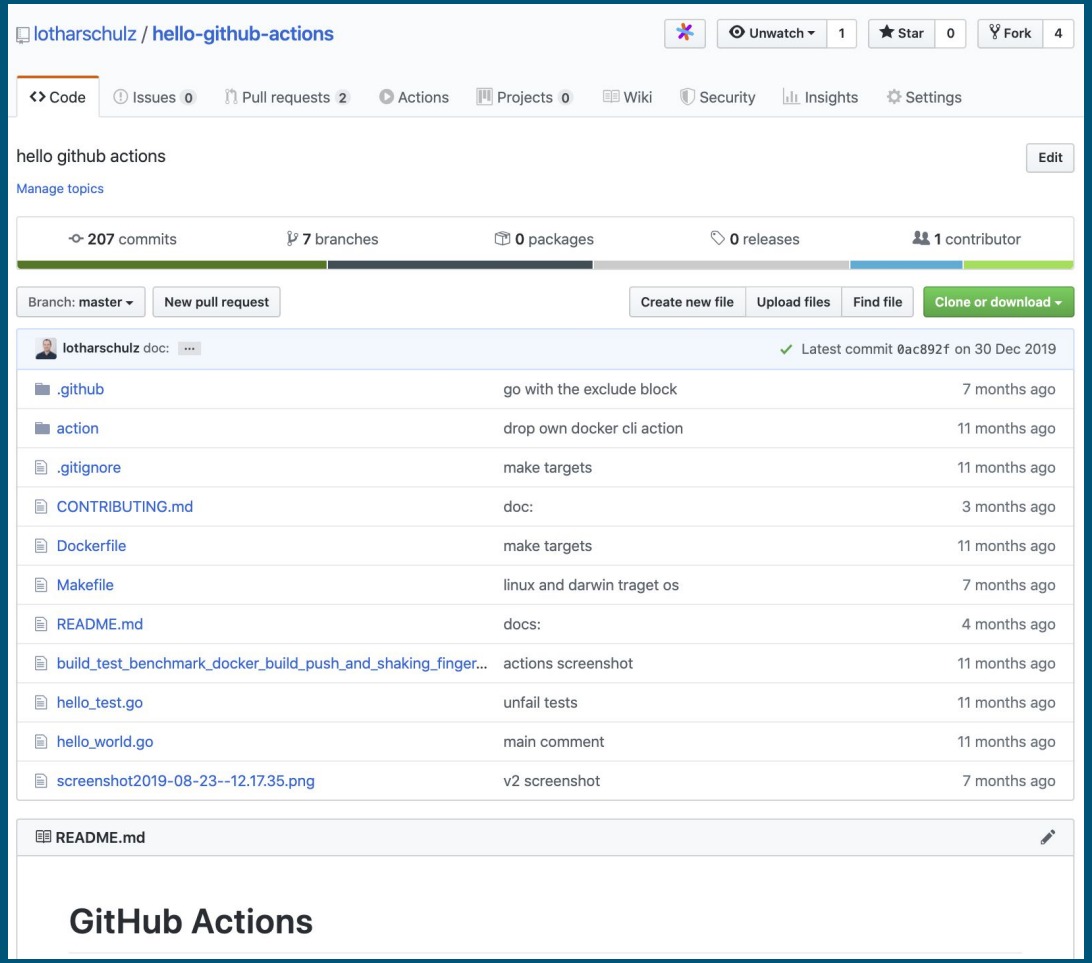
Fix

```
test:
  runs-on: ubuntu-18.04
  steps:
  - uses: actions/checkout@v1
  - uses: actions/setup-java@v1
    with:
      java-version: 11
  - uses: eskatos/gradle-command-action@v1
    with:
      arguments: test
#   - name: test the code
```



Demo

Demo Code


lotharschulz / hello-github-actions
Unwatch 1
Star 0
Fork 4
Code
Issues 0
Pull requests 2
Actions
Projects 0
Wiki
Security
Insights
Settings
hello github actions
Edit
Manage topics
207 commits
7 branches
0 packages
0 releases
1 contributor
Branch: master
New pull request
Create new file
Upload files
Find file
Clone or download
lotharschulz doc:
Latest commit 0ac892f on 30 Dec 2019
.github go with the exclude block 7 months ago
action drop own docker cli action 11 months ago
.gitignore make targets 11 months ago
CONTRIBUTING.md doc: 3 months ago
Dockerfile make targets 11 months ago
Makefile linux and darwin traget os 7 months ago
README.md docs: 4 months ago
build_test_benchmark_docker_build_push_and_shaking_finger... actions screenshot 11 months ago
hello_test.go unfail tests 11 months ago
hello_world.go main comment 11 months ago
screenshot2019-08-23--12.17.35.png v2 screenshot 7 months ago
README.md
GitHub Actions

There is even more

- Core concepts
- Encrypted secrets
- Self hosted runners

There is more

- Contexts available on run time
- Triggered by own events
- Package manager and gh docker registry integrated

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SLIDE DECK

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