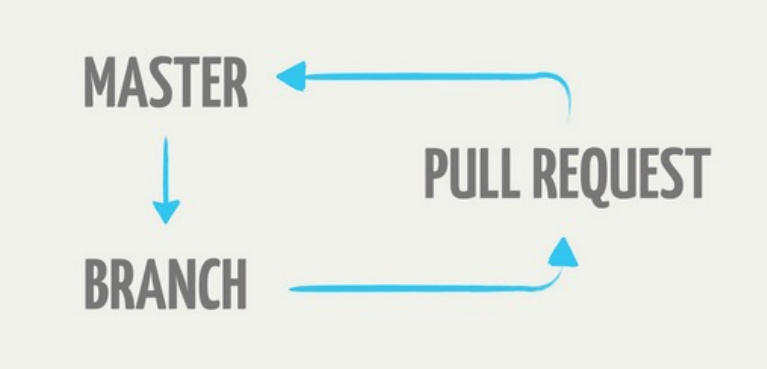
软件工程

持续集成（GitHub Action）

Spring 2022, SWUFE

复习

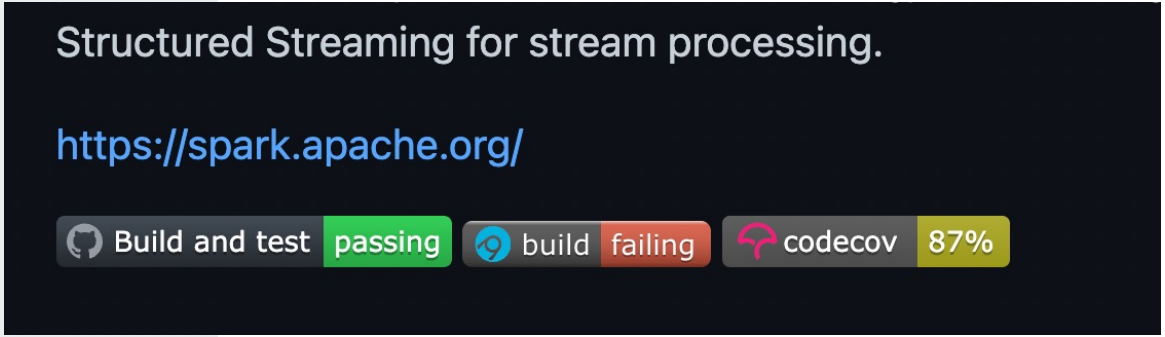
- 文档（Markdown）
- 测试（单元测试、性能测试、Mocking测试）
- 需求分析
- 软件设计（OO编程、设计模式）

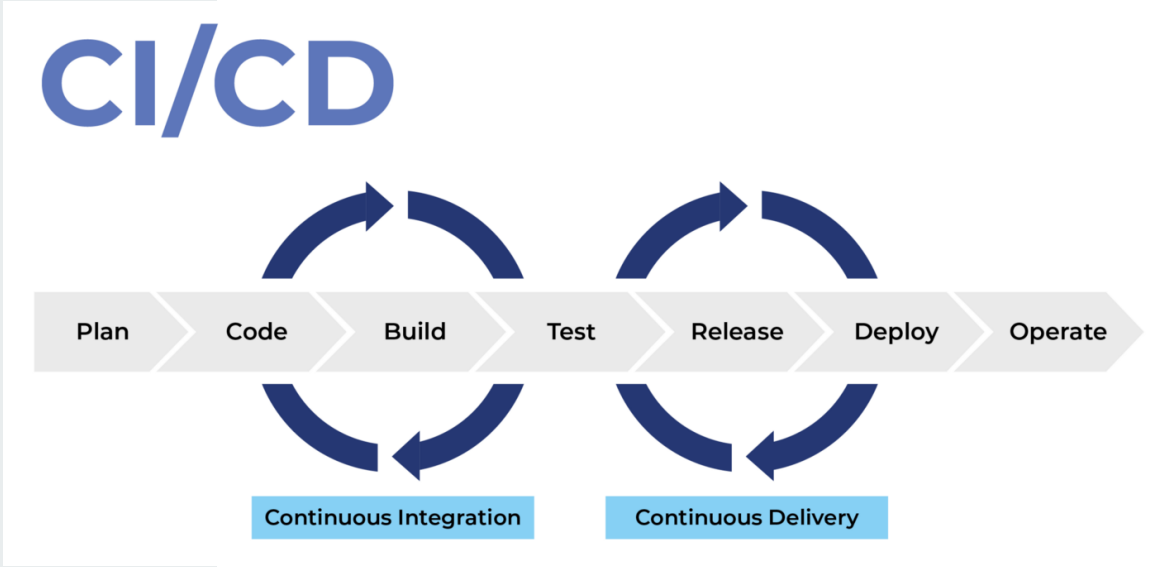


如何确保代码都是「可部署的」？

1. 持续集成

CI/CD


Structured Streaming for stream processing.
https://spark.apache.org/
Build and test passing
build failing
codecov 87%

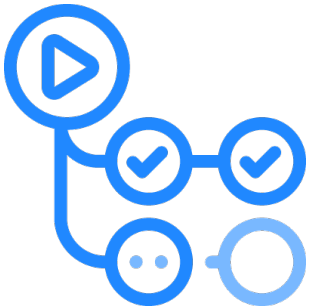

CI/CD
Plan
Code
Build
Test
Release
Deploy
Operate
Continuous Integration
Continuous Delivery

1.1 常用服务

Travis CI

CircleCI

Jenkins



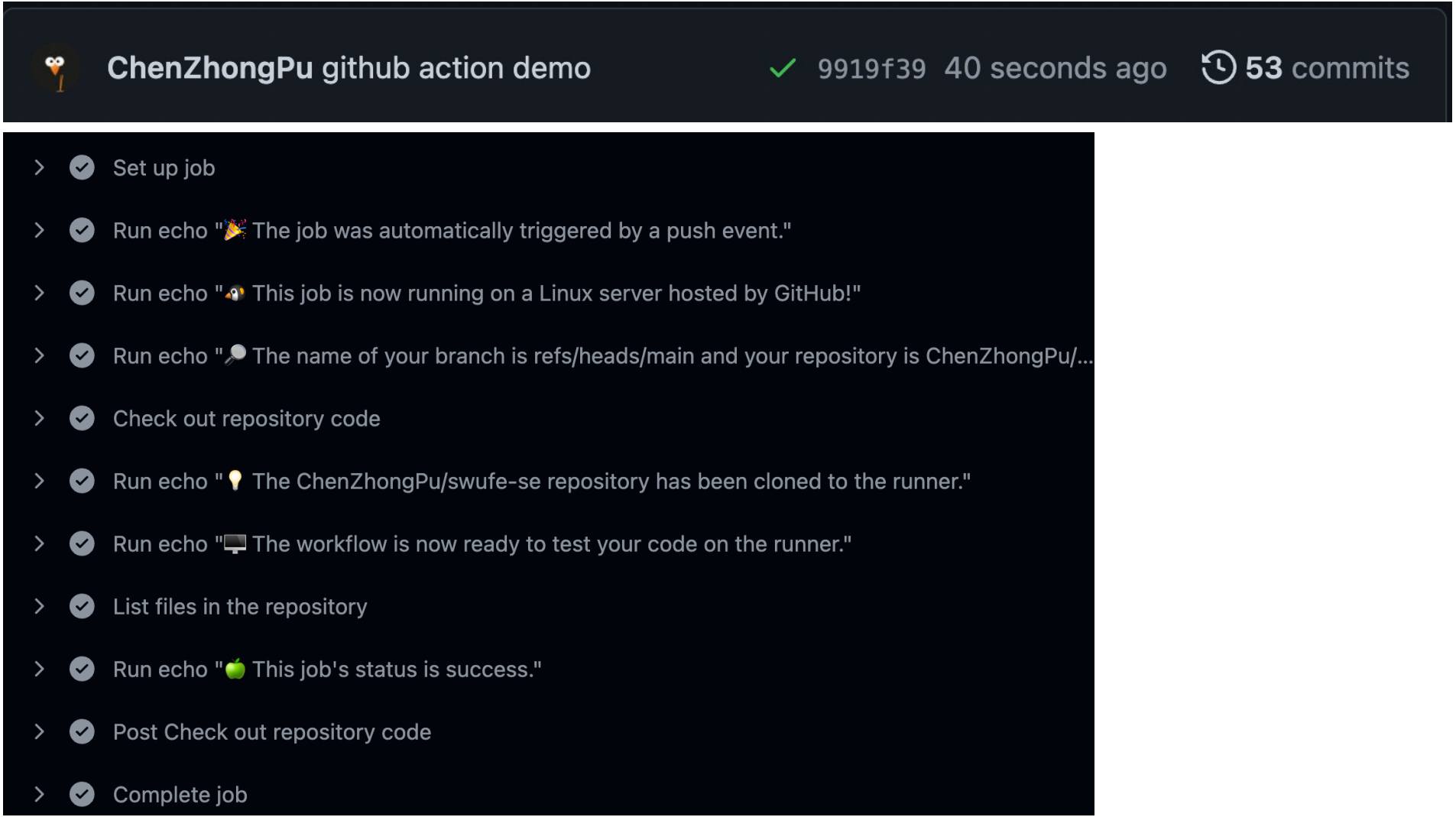
GitHub Action

https://docs.github.com/en/actions/quickstart

1.2 Github Action

在 Github 仓库里面新建一个 .github/workflows 目录，再新建一个 github-actions-demo.yml 文件。

```yaml
name: GitHub Actions Demo
on: [push]
jobs:
  Explore-GitHub-Actions:
    runs-on: ubuntu-latest
    steps:
      - run: echo "🎉 The job was automatically triggered by a ${{ github.event_name }} event."
      - run: echo "🐧 This job is now running on a ${{ runner.os }} server hosted by GitHub!"
      - run: echo "🔎 The name of your branch is ${{ github.ref }} and your repository is ${{ github.repository }}."
      - name: Check out repository code
        uses: actions/checkout@v3
      - run: echo "💡 The ${{ github.repository }} repository has been cloned to the runner."
      - run: echo "🖥️ The workflow is now ready to test your code on the runner."
      - name: List files in the repository
        run: |
          ls ${{ github.workspace }}
      - run: echo "🍏 This job's status is ${{ job.status }}."
```


ChenZhongPu github action demo
9919f39 40 seconds ago
53 commits
Set up job
Run echo "🎉 The job was automatically triggered by a push event."
Run echo "🐧 This job is now running on a Linux server hosted by GitHub!"
Run echo "🔎 The name of your branch is refs/heads/main and your repository is ChenZhongPu/...
Check out repository code
Run echo "💡 The ChenZhongPu/swufe-se repository has been cloned to the runner."
Run echo "🖥️ The workflow is now ready to test your code on the runner."
List files in the repository
Run echo "🍏 This job's status is success."
Post Check out repository code
Complete job

```yaml
name: GitHub Actions Demo
on: [push]
jobs:
  Explore-GitHub-Actions:
    runs-on: ubuntu-latest
    steps:
      - run: echo "🎉 The job was automatically triggered by a ${{ github.event_name }} event."
      - run: echo "🐧 This job is now running on a ${{ runner.os }} server hosted by GitHub!"
      - run: echo "🔎 The name of your branch is ${{ github.ref }} and your repository is ${{ github.repository }}."
      - name: Check out repository code
        uses: actions/checkout@v3
      - run: echo "💡 The ${{ github.repository }} repository has been cloned to the runner."
      - run: echo "🖥️ The workflow is now ready to test your code on the runner."
      - name: List files in the repository
        run: |
          ls ${{ github.workspace }}
      - run: echo "🍏 This job's status is ${{ job.status }}."
```

You, now • Uncommitt

大家知道，持续集成由很多操作组成，比如**抓取代码**、**运行测试**、**登录远程服务器**，**发布到第三方服务**等等。GitHub 把这些操作就称为 actions。

如果你需要某个 action，不必自己写复杂的脚本，直接引用他人写好的 action 即可，整个持续集成过程，就变成了一个 actions 的组合。这就是 GitHub Actions 最特别的地方。

```
- name: Set up JDK 11
  uses: actions/setup-java@v1
  with:
    java-version: 11
- name: Build with gradle
  run: cd ${{ github.workspace }}/week12/mock && ./gradlew
```

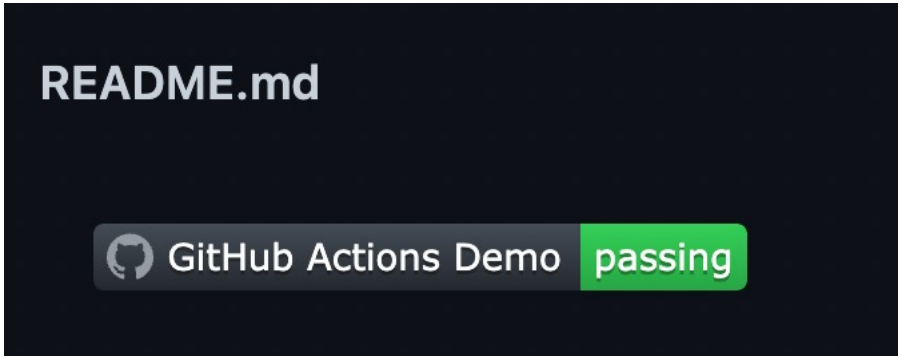
1.3 基本概念


Runner就是运行Job的服务器
Event
Runner 1
Job 1
Step 1: Run action
Step 2: Run script
Step 3: Run script
Step 4: Run action
Runner 2
Job 2
Step 1: Run action
Step 2: Run script
Step 3: Run script

1.4 Java案例

```yaml
Mocking-Test:
  runs-on: ubuntu-latest
  steps:
    - name: Check out repository code
      uses: actions/checkout@v3
    - name: Set up JDK 11
      uses: actions/setup-java@v1
      with:
        java-version: 11
    - name: Build with gradle
      run: cd ${{ github.workspace }}/week12/mock && ./gradlew
    - name: Test with gradle
      run: cd ${{ github.workspace }}/week12/mock && ./gradlew test
```

添加 status badge



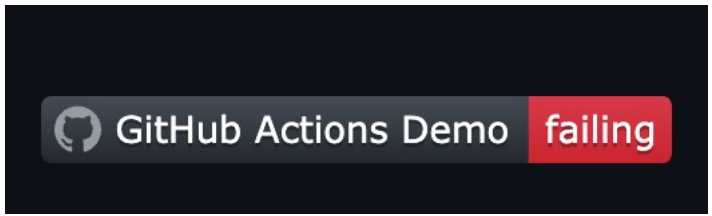

```
![example workflow](https://github.com/ChenZhongPu/swufe-se/actions/workflows/demo.yml/badge.svg)
```

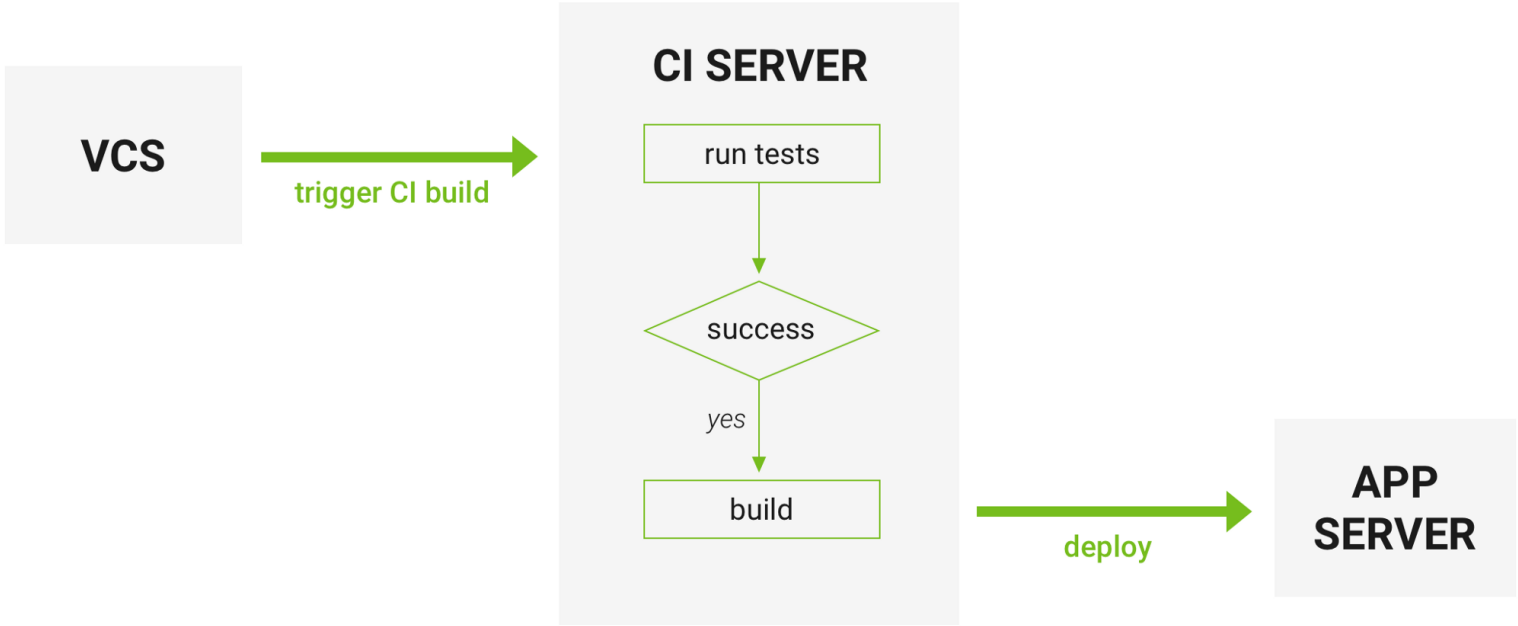
1.5 Python案例

```yaml
Python-Test:
  runs-on: ubuntu-latest
  steps:
    - name: Check out repository code
      uses: actions/checkout@v3
    - name: Set up Python 3.8
      uses: actions/setup-python@v1
      with:
        python-version: 3.8
    - name: Install dependencies
      run: cd ${{ github.workspace }}/week14/pyci && pip install -r ./requirements.txt
    - name: Test with Python
      run: cd ${{ github.workspace }}/week14/pyci && python ./test_main.py      You, 3
```

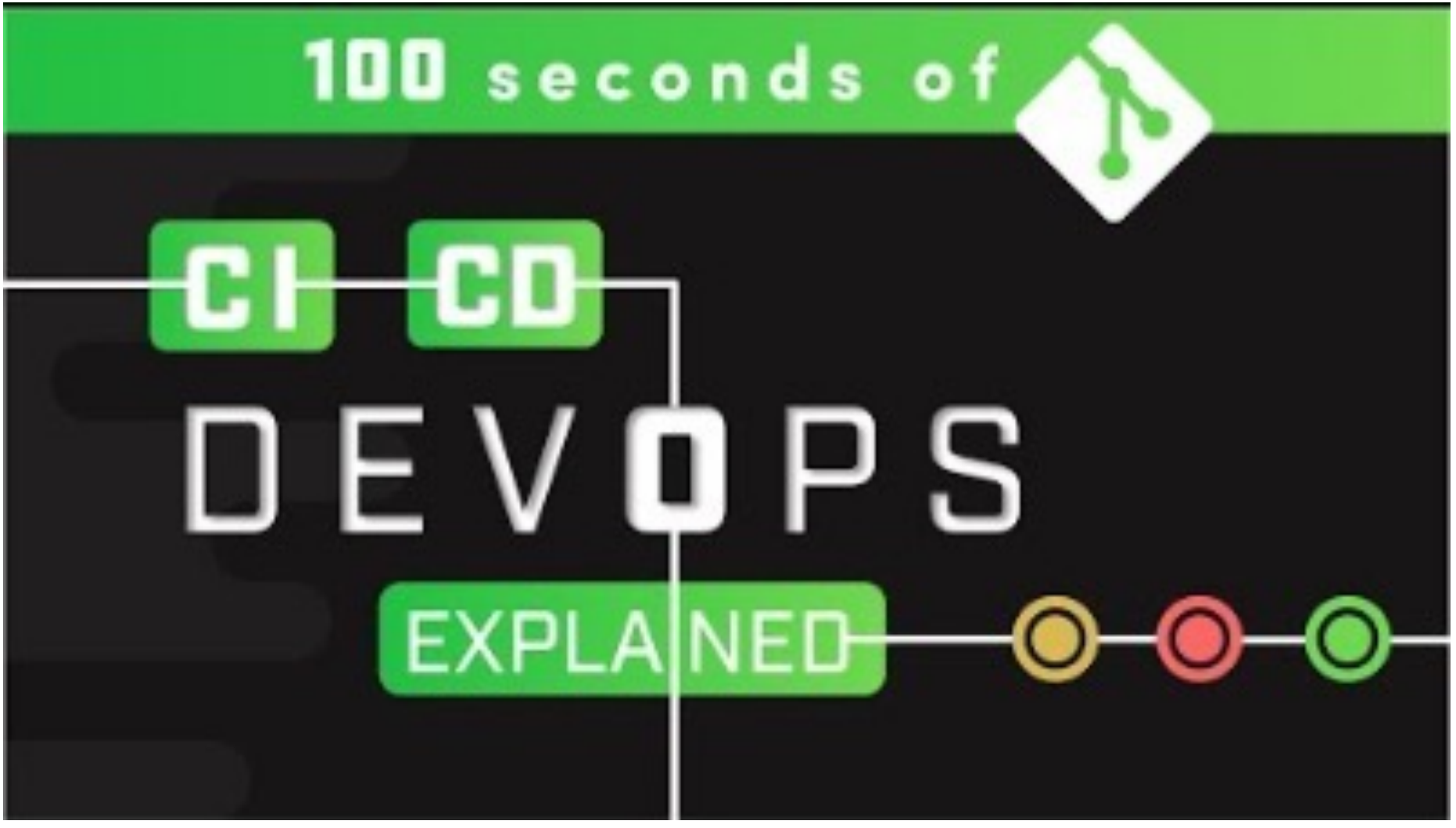
```python
class Test(TestCase):
    def test_compute_eig(self):
        A = np.array([[3, -1], [-1, 3]])
        self.assertAlmostEqual(compute_eig(A), 3)
```

✕ ec919db 3 minutes ago






```
- name: Build with Gradle
  run: ./gradlew bootJar
- name: 'Deploy to Azure WebApp'
  uses: azure/webapps-deploy@v2
  with:
    app-name: ${{ env.AZURE_WEBAPP_NAME }}
    publish-profile: ${{ env.AZURE_WEBAPP_PUBLISH_PROFILE }}
    package: '${{ env.AZURE_WEBAPP_PACKAGE_PATH }}/build/libs/*.jar'
```


100 seconds of
CI
CD
DEVOPS
EXPLAINED

第8次作业（20分）

使用 Github Action 或其他CI 服务，对你的仓库进行简单的构建、测试。

https://github.com/ChenZhongPu/swufe-se/blob/main/.github/workflows/demo.yml