Lab 3

Software Testing 2023

2023/03/09

#whoami

- Software Quality Lab @ EC547

- TA

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GitHub Repo

- <student_id>-ST-2023

- Add collaborators

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Parameterization & Exception

Parameterization

```python
from unittest import TestCase

param_list = [('a', 'a'), ('a', 'b'), ('b', 'b')]

class TestDemonstrateSubtest(TestCase):
    def test_works_as_expected(self):
        for p1, p2 in param_list:
            with self.subTest():
                self.assertEqual(p1, p2)
```
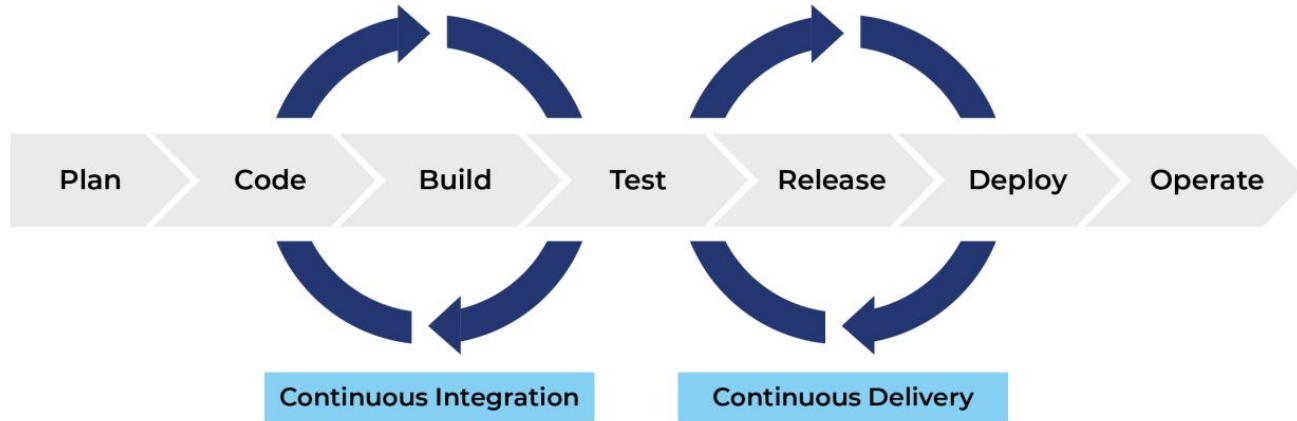
Exception

```python
import mymod

class MyTestCase(unittest.TestCase):
    def test1(self):
        self.assertRaises(SomeCoolException, mymod.myfunc)
```

Continuous Integration

GitHub Action

- CI / CD platform

- Provides Linux, Windows, and macOS virtual machines to run your workflows

The Workflow File

```
1    name: Lab02 CI
2    run-name: ${{ github.actor }} is testing out GitHub Actions 🚀
3    on: [push]
4    jobs:
5      Explore-GitHub-Actions:
6        runs-on: ubuntu-latest
7        strategy:
8          fail-fast: false
9          matrix:
10           python-version: ["3.8"]
11
12       steps:
13       - uses: actions/checkout@v3
14       - name: Set up Python ${{ matrix.python-version }}
15         uses: actions/setup-python@v4
16         with:
17           python-version: ${{ matrix.python-version }}
```

Specifies the trigger for this workflow. This example uses the `push` event, so a workflow run is triggered every time someone pushes a change to the repository or merges a pull request. This is triggered by a push to every branch; for examples of syntax that runs only on pushes to specific branches, paths, or tags, see "Workflow syntax for GitHub Actions."

The Workflow File

```
18        - name: Install dependencies
19          run: |
20            python -m pip install --upgrade pip
21            python -m pip install flake8
22            if [ -f requirements.txt ]; then pip install -r requirements.txt; fi
```

# The Workflow File

```
23        - name: Lint with flake8
24          run: |
25            # stop the build if there are Python syntax errors or undefined names
26            flake8 . --count --select=E9,F63,F7,F82 --show-source --statistics
27            # exit-zero treats all errors as warnings. The GitHub editor is 127 chars wide
28            flake8 . --count --exit-zero --max-complexity=10 --max-line-length=127 --statistics
29        - name: Test with unittest
30          run: |
31            cd Lab02
32            python3 -m unittest app_test.py 2>/dev/null
33            python3 -m unittest app_test.py -b -v
```

The Workflow File

Example: Including paths

If at least one path matches a pattern in the `paths` filter, the workflow runs. For example, the following workflow would run anytime you push a JavaScript file (`.js`).

```
on:
  push:
    paths:
      - '**.js'
```

master

branch

new_feature

merge

time
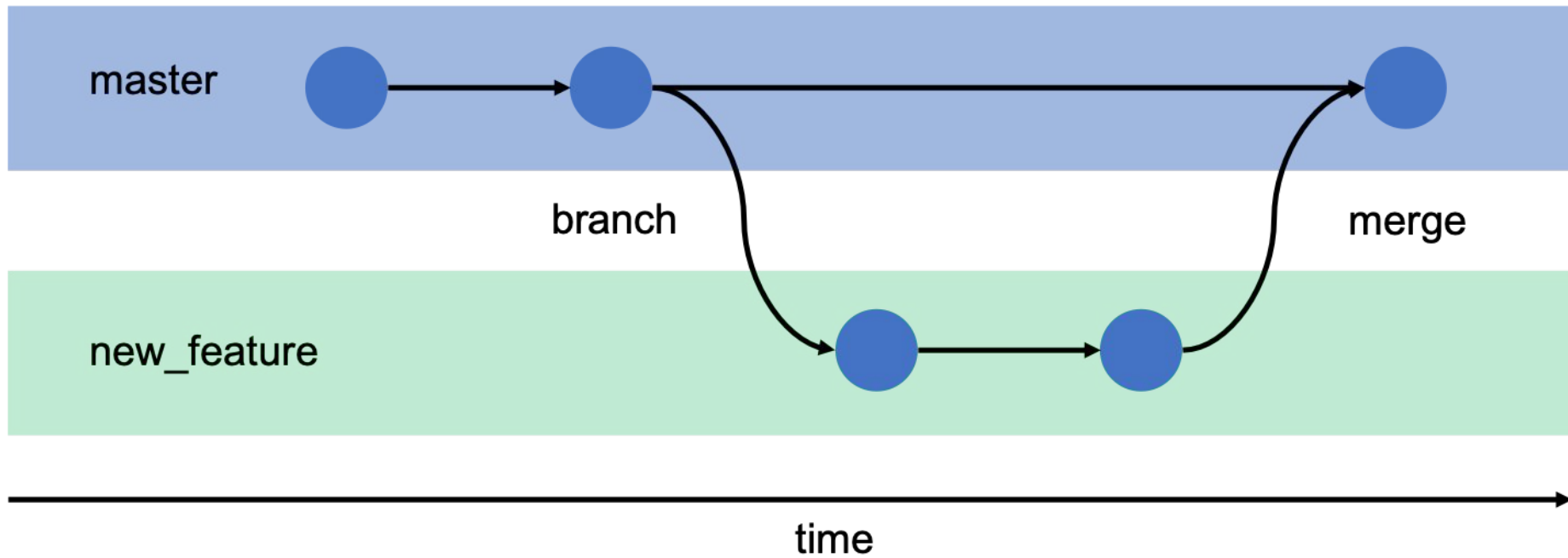
Example: Including branches and tags

The patterns defined in `branches` and `tags` are evaluated against the Git ref's name. For example, the following workflow would run whenever there is a `push` event to:

- A branch named `main` (`refs/heads/main`)
- A branch named `mona/octocat` (`refs/heads/mona/octocat`)
- A branch whose name starts with `releases/` , like `releases/10` (`refs/heads/releases/10`)
- A tag named `v2` (`refs/tags/v2`)
- A tag whose name starts with `v1.` , like `v1.9.1` (`refs/tags/v1.9.1`)

```
on:
  push:
    # Sequence of patterns matched against refs/heads
    branches:
      - main
      - 'mona/octocat'
      - 'releases/**'
    # Sequence of patterns matched against refs/tags
    tags:
      - v2
      - v1.*
```

flake8

- flake8 is a python tool that glues together pycodestyle, pyflakes, mccabe, and third-party plugins to check the style and quality of some python code.

```
flake8 path/to/code/to/check.py
# or
flake8 path/to/code/
```

PEP 8

- Style Guide for Python Code

```
# Correct:
import os
import sys
```

```
# Wrong:
import sys, os
```

```
# Correct:
spam(ham[1], {eggs: 2})
```

```
# Wrong:
spam( ham[ 1 ], { eggs: 2 } )
```

Lab 3

Lab 3

Part 1

For the following functions, please use specific Python Exception Type for comparison. For instance, use TypeError other than Exception.

`test_add()` , `test_divide()` , `test_sqrt()` , `test_exp()`

For each test, please

- use for loop to test 5 sets of valid input. Use assertEqual to check the output.
- test a set of invalid input. Use assertRaises to compare the output.

Lab 3

Part 2

Please implement `Lab03-CI.yml`. Achieve the following goals.

- Use `python3 -m unittest calculator_test.py -v` as command to execute Lab 3 program.
- Use `flake8 calculator_test.py` to check your code, modify your code to follow the PEP8 coding style.

Spec & Code

- [NYCU-Software-Testing-2023](#)

Submission

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<> Code   ⊙ Issues   ⑂ Pull requests   ⊙ **Actions**   ⊞ Projects   ◫ Wiki   ⊘ Security   ⬚ Insights   ⚙ Settings

Actions

New workflow

All workflows

GitHub Actions Demo

Lab01 CI

Lab02 CI

Management

⊟ Caches

All workflows

Showing runs from all workflows

🔍 Filter workflow runs

▷◦◦ Tell us how to make GitHub Actions work better for you with three quick questions.   **Give feedback**   ✕

43 workflow runs   Event ▾   Status ▾   Branch ▾   Actor ▾

✅ **chameleon10712 is testing out GitHub Acti...**
GitHub Actions Demo #21: Commit 4a337a1 pushed by chameleon10712   `main`   🗓 2 minutes ago ⏱ 13s •••

❌ **chameleon10712 is testing out GitHub Acti...**
Lab02 CI #8: Commit 4a337a1 pushed by chameleon10712   `main`   🗓 2 minutes ago ⏱ 17s •••

✅ **chameleon10712 is testing out GitHub Acti...**
Lab01 CI #14: Commit 4a337a1 pushed by chameleon10712   `main`   🗓 2 minutes ago ⏱ 21s •••

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← GitHub Actions Demo

✓ **chameleon10712 is testing out GitHub Actions** 🚀 #21

Re-run all jobs   ···

🏠 Summary

Jobs

✓ Explore-GitHub-Actions

Run details

⏱ Usage

📄 Workflow file

Explore-GitHub-Actions
succeeded 2 minutes ago in 4s

Search logs   🔄 ⚙

> ✓ Set up job   1s

> ✓ Run echo "🎉 The job was automatically triggered by a push event."   0s

> ✓ Run echo "🐧 This job is now running on a Linux server hosted by GitHub!"   0s

> ✓ Run echo "🔎 The name of your branch is refs/heads/main and your repository is chameleon107...   0s

> ✓ Check out repository code   0s

> ✓ Run echo "💡 The chameleon10712/NYCU-Software-Testing-2023 repository has been cloned to ...   0s

> ✓ Run echo "🖥 The workflow is now ready to test your code on the runner."   0s

> ✓ List files in the repository   0s

> ✓ Run echo "🍏 This job's status is success."   0s

Submission

- Add Lab03 status badge in your README file

- Please submit your Github repo <student_id>-ST-2023 (1) commit URL (2) github

  action job URL to E3

- commit URL

  - refer to Lab 1 submission

Reference

- https://docs.github.com/en/actions/using-workflows/workflow-syntax-for-github-actions#example-including-paths

- https://docs.github.com/en/actions/using-workflows/workflow-syntax-for-github-actions#example-including-branches-and-tags

- https://flake8.pycqa.org/en/latest/

- https://peps.python.org/pep-0008/