



# CI/CD with Github Actions

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# What is CI/CD?

- Continuous Integration / Continuous Delivery
- CI: Get new changes integrated into the shared repository faster
- CD: Get new features deployed to users faster
- Main idea: Automate several steps that required slow human intervention
- Side idea: Change in mindset and how you develop software



# Github Basics

- Github is a platform that allows you to upload your git repository to the cloud
- Local repository vs remote repository
- Your basic local workflow is still the same:
  - Making changes
  - Tracking changes
  - Committing changes
- One extra step: pushing



# Pushing

- Pushing your changes after you commit them will make the remote repository synced with the local repository
- To push for the first time:
  - `git push -u origin master`
- After that:
  - `git push`



# Pull Requests

- Master branch is usually a very important and protected branch
  - Used for production
  - Should represent the most stable version of your software
  - Should be functional and bug free
- As a developer in a large project, you might not directly have access to modify the master branch
  - Safety concerns
- So how do we integrate our changes into the software?



# How to make pull requests?

- You can make changes to your feature branch and push them to Github
- You make a pull request on Github, which will create a request to merge the changes in your branch into the master branch
- The admins of the repository will be able to
  - Review your code
  - Give feedback
  - Ask for changes
  - Approve the changes and merge them into the master branch!!



# Typical Development Workflow

Let's say you are a developer working at a big company and you are creating a new feature for their app.

1. You create a new feature branch from the master branch
2. You write some new code
3. Every so often, you commit and push the code to your own branch
4. Once you are done working on that feature, you make a PR
5. Your project manager reviews the code, run tests and approves the changes.

CAN TAKE A  
LONG TIME



# CI/CD Paradigm

- Automate the code review process
- Accelerate the code development cycle
- Commit to master everyday
- The code changes more often in smaller amounts
  - Catch integration issues early and easier to fix





# Github Actions

- A feature for Github repositories
- Allows you to run workflows with Github events (push, PRs)
- We are going to use to it lint our code and run some tests!



# Our example

- We are going to develop a simple arithmetic library
- Github Actions can make sure our functions are correct and efficient



# Getting Started with Github Actions

<> Code

! Issues

🔗 Pull requests

▶ Actions

📁 Projects

! Security

📈 Insights

⚙️ Settings

## Workflows made for your Python repository Suggested

### Publish Python Package

By GitHub Actions

Publish a Python Package to PyPI on release.

Set up this workflow

```
python -m pip install --upgrade pip
pip install setuptools wheel twine
python setup.py sdist bdist_wheel
```

actions/starter-workflows

Python

### Python package

By GitHub Actions

Create and test a Python package on multiple Python versions.

Set up this workflow

```
python -m pip install --upgrade pip
pip install flake8 pytest
if [ -f requirements.txt ]; then pip install -r requirements.txt; fi
```

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Python

### Python Package using Anaconda

By GitHub Actions

Create and test a Python package on multiple Python versions using Anaconda for package management.

Set up this workflow

```
# $CONDA is an environment variable pointing to the root of the
miniconda directory
$CONDA/bin/conda env update --file environment.yml --name base
$CONDA/bin/conda install flake8
```

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Python

### Python application

By GitHub Actions

Create and test a Python application.

Set up this workflow

```
python -m pip install --upgrade pip
pip install flake8 pytest
if [ -f requirements.txt ]; then pip install -r requirements.txt; fi
```

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Python