PARTIOF PRODUCTION READY CODE SERIES



Continuous Integration



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What is Continuous Integration (CI)?

- The benefits of CI
- The CI landscape
- Why should I care about CI?
- Mock Scenario + Questions

Hands-on Workshop Code Coverage and Metrics



What is **Continuous Integration?**

Continuous Integration (CI) is the practice of routinely integrating code changes into the main or development branches of a repository, and testing the changes, as early and often as possible.

Ideally, developers will integrate their code daily, if not multiple times a day.









Benefits of Continuous Integration?

- Cl offers a real-time window into the actual state of the software system and associated quality measurements, allowing immediate and constant engagement of all team members, including operations, product owners and QA, throughout the project lifecycle.
- Cl is also a great way to reduce the amount of time spent on fixing bugs and regression by putting more emphasis on having a good test suite.









The CI Landscape

- Currently there are many popular tools being used in the CI space such as Travis CI, Jenkins, Circle CI, Gitlab CI to name a few.
- Some are intuitive, easy to setup and have excellent integrations with GitHub such as Travis Cl (popular among open source communities)
- Some are highly customizable and on-perm like Jenkins, allowing you to control every aspect of your DevOps pipeline in house.











Example in a Scenario

Jin is a Software Engineering intern at a big eCommerce company.

He is tasked with a user story for a **new feature** request for an internal microservice. Being a UTSC student, he's obviously brilliant so he finishes creating the feature early and creates a pull request for his branch to be merged to the master.

Jin claims he created and ran all the tests on his computer and his description follows all the guidelines, so Rachel, being the senior engineer approves his pull request.





Example in a Scenario

A few days later, it is noticed that the company's APIs start intermittently failing and everyone is firefighting to patch the issue.

Eventually the faulty feature that caused all downstream microservices to fail is identified, but by that time the company has lost a million dollars in revenue.

How could have CI helped prevent this tragic situation?





Alex Li

Apparently my coworker intern already cost the company \$100,000 due to bug



kuroba That too But the funny thing is Each test run usually costs like 30\$ For a company at the scale of wish ...

kuroba

Yeah, usually EC2



At fb, each test run was about 80\$

Alex Li

Apparently it was a logic error on one line



I dont know full context



yeah what kinda stuff was it that the testing didn't catch

aws instances?





Take a break and open your laptops.

OPS PROBLEM NOW



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to contribute to matplotlib, check out the guide to working with the source code.

matplotlib / matplotlib

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matplotlib: plotting with Python http://matplotlib.org/



Matplotlib is a Python 2D plotting library which produces pul interactive environments across platforms. Matplotlib can be or Mathematica), web application servers, and various graphi

NOTE: The current master branch is now Python 3 only. Pytho

Home page

Installation

For installation instructions and requirements, see the INSTALL.rst file or the install to contribute to matplotlib, check out the guide to working with the source code.

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Working with CI Workshop

- Forking and Cloning a repository
- Creating **GitHub integrations** w/TravisCl and Coveralls
- Defining .travis.yml
 - Running environment and OS •
 - Code styles and linting •
 - Running tests
 - Coverage reports
- Reading the Travis CI report •
- Analyzing additional tools
- Adding the buttons to your GitHub repository





Forking and **Cloning a Repo**

• We'll be working with a repo that has a Palindrome checker

github.com/csecutsc/code-samples

O Unwatch ▼ 5	★ Star 1 ¥ Fork 1 Fork your own co	2p	Forking csec It should on
	Edit		
ases	Le 1 contributor		

utsc/code-samples

nly take a few seconds.







Read the Code and Understand

Two main files:

palindromes.py

the logic behind palindrome detection and processing

test-palindromes.py the test suite that executes tests for certain functions in palindromes.py



Setting up Travis CI

Navigate to Travis CI website and click **Sign in with GitHub**







Authorize Travis CI for Open Source



Setting up Travis CI

X

Dashboard

Travis Cl



Changelog





We're only showing your public repositories. You can find your private projects on travis-ci.com.

Legacy Services Integration





Defining a .travis.yml file

In the .travis.yml a file you're specifying your **OS**, the programming language, your repo branch, the project file name and other details.

In the requirements.txt file you define requirements to be installed.

By reading these files, Travis-Cl create a virtual environment with the specified parameters to run our code.

```
dist: trusty
    sudo: required
 3
    language: python
 4
   python:
 5
      - "2.7.14"
 6
 8 ▼ install:

    pip install ---upgrade setuptools

      – pip install –r requirements.txt
10

    pip install pytest pytest-cov

11
12
      – pip install coveralls
13
14 v script:
15
      – python test_palindromes.py
      - pylint palindromes.py
16
17
      – pycodestyle palindromes.py
18
      - py.test --cov=.
19

coverage report

20
   after_success:
22
      coveralls
```

pylint 2 pycodestyle



Working with Cl Workshop

Follow Along! Demo time!

Beyond Continuous Integration

That's cool – we can continuously test and push code into production! What's next?

What about:

- Running your project on any platform
- Rapid deployment of applications
- Scaling your application up and down to user needs

Answer questions like:

- What are containers? What is a microservice?
- Whats a **helmsman** and a **whale** gotta do with it?







Continuous Deployment



PART II OF PRODUCTION READY CODE SERIES

