



# An Introduction to GitHub tools

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# Concepts

- Continuous integration
  - Practice of frequently merging code into a shared repository, verified by automated builds and tests
- Code coverage
  - A measure of what degree source code is tested by a test suite
- Code quality metrics
  - Static code analysis producing measures of style guide conformity, code smells and errors



# GitHub

- Web-based Git repository hosting service
- Free for open-source projects (can use Bitbucket for free private repositories)
- Repositories can belong to users or organizations
- Can fork (copy) repositories to your own/organization account, make changes, and then submit a pull request (change proposal) to the original repository owner
- Lots of third-party applications available



# Pull Requests

- Method of submitting contributions to a project via the GitHub web interface
- Collects together and displays all changes in a Git branch for review
- Allows for commenting, adding more commits and can show the status of automated tests



# Travis CI

- Hosted continuous integration service used to build and test projects hosted on GitHub
- Build controlled by a `.travis.yml` file written in YAML and kept in the top level of a repository



# Example .travis.yml

```
language: python
python: "2.7"
# Route the build to the (faster) container-based infrastructure
sudo: false

install: pip install -r requirements.txt

# Commands that prepare things for the test
before_script:
  - export PYTHONPATH=$PYTHONPATH:`pwd` -P`
  - cd src/tests

# Command to run the tests
script: coverage run --source=src -m unittest2 discover -buffer

# Send coverage data to coveralls.io
after_success: coveralls
```



# Coveralls.io

- Records repository test coverage statistics from automated test systems such as Travis CI





# Landscape.io

- Records and displays code quality metrics and trends for Python projects hosted on GitHub
- Very simple set up as it does not rely on Travis builds



# Further Information

- Demonstration repository:
  - <https://github.com/tofu-rocketry/tool-test>
- [https://en.wikipedia.org/wiki/Continuous\\_integration](https://en.wikipedia.org/wiki/Continuous_integration)
- [https://en.wikipedia.org/wiki/Code\\_coverage](https://en.wikipedia.org/wiki/Code_coverage)
- <https://help.github.com/>
- <http://docs.travis-ci.com/>
- <https://coveralls.zendesk.com/>
- <https://docs.landscape.io/>

