



COMP120: Creative Computing: Tinkering

4: Code Review

Register Attendance

Module Attendance:



Attendance

Figure 1: Attendance monitoring is in place. It is your responsibility to ensure that you have signed yourself in.

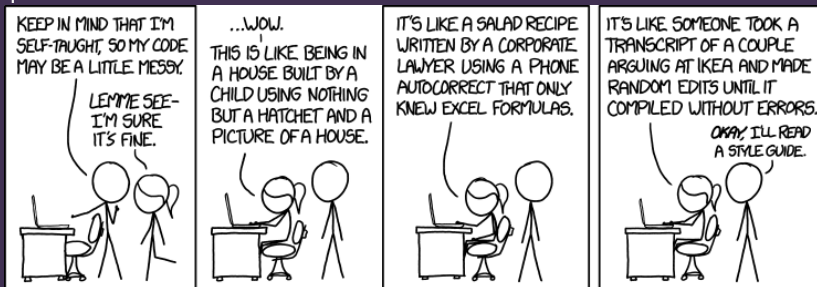
Learning Outcomes

After this session you will be able to:

- ▶ **Identify** the key aspects of maintainable code
- ▶ **Apply** linters to source files
- ▶ **Conduct** a code review
- ▶ **Describe how** code could be improved

Code Review

1



"Peer review—an activity in which people other than the author of a software deliverable examine it for defects and improvement opportunities—is one of the most powerful software quality tools available."

What to review

- ▶ Avoid 'Not applicable here' (NAH) Syndrome
- ▶ Any size project can benefit from code review
- ▶ Review no more than 400 lines at a time
- ▶ 200 Line of code an hour (once familiar with code reviews)

Difficulties

- ▶ Pressure on both reviewer and reviewee
- ▶ Not instinctive behavior
- ▶ Honesty
- ▶ Fear of offending
- ▶ Set aside your ego and pride
- ▶ Accepting critique (Don't take it personally)
- ▶ Misunderstood as time consuming
- ▶ Too busy

Benefits

- ▶ Shortened product development cycle time
- ▶ Less time spent performing rework
- ▶ Increased group programming productivity
- ▶ Better techniques learned from other developers*
- ▶ Team cohesion
- ▶ Exchanging of information about components and overall system with other team members
- ▶ Better quality code base

Karl E. Wiegers - Humanizing Peer Reviews, 2002

Egoless Programming

A term first coined in 1971 by Gerald Weinberg - The Psychology of Computer Programming

*"egoless programming," not "egoless programmer."
Developers need a robust enough ego to trust
and defend their work, but not so much ego that
they reject suggestions for better solutions. Similarly,
the egoless reviewer should have compassion and
sensitivity for his colleagues, if only because their
roles will be reversed one day.*

Karl E. Wiegers - Humanizing Peer Reviews, 2002

Tips for reviewee

- ▶ Strive for quality
- ▶ RESPECT
- ▶ be receptive
- ▶ Reciprocate don't retaliate

Tips for reviewer

- ▶ RESPECT
- ▶ Avoid accusatory language
- ▶ Discuss the work not the author
- ▶ Be constructive with your criticism
- ▶ “Bugs are the bad guy” - Wiegers
- ▶ Identify the good as well as the bad

Planning a Review



- ▶ Allocate time and resources
- ▶ Create a check list
- ▶ No more than 60 mins at a time
- ▶ Lock in scope
- ▶ Identify the lines for review

ZEN



```
import this
```

Some helpful talking points

```
>import this
```

```
## The Zen of Python, by Tim Peters
##
## Beautiful is better than ugly.
## Explicit is better than implicit.
## Simple is better than complex.
## Complex is better than complicated.
## Flat is better than nested.
## Sparse is better than dense.
## Readability counts.
## Special cases aren't special enough to break the rules.
## Although practicality beats purity.
## Errors should never pass silently.
## Unless explicitly silenced.
## In the face of ambiguity, refuse the temptation to guess.
## There should be one-- and preferably only one --obvious way to do it.
## Although that way may not be obvious at first unless you're Dutch.
## Now is better than never.
## Although never is often better than *right* now.
## If the implementation is hard to explain, it's a bad idea.
## If the implementation is easy to explain, it may be a good idea.
## Namespaces are one honking great idea -- let's do more of those!
```

Potential Issues: General



- ▶ Does it work? (CI and TDD later on in the course)
- ▶ Does the code follow the teams' preferred paradigms
- ▶ Optimisation

Potential Issues: Look and Feel

Did the author show respect for their code

- ▶ Repetition
- ▶ Shy code - loosely coupled (Pragmatic Programmer)
- ▶ Indentations
- ▶ Redundant code - delete it don't comment it out
- ▶ Blank lines
- ▶ Debugging code removed
- ▶ General Tidyness

Readability



- ▶ Consistent naming conventions
- ▶ Names reflect their purpose (variables, functions, classes. . .)
- ▶ Comments are consistent and appropriate
- ▶ Easy to follow the flow
- ▶ line lengths (79 chars ish)

Potential Issues: Variables



- ▶ Consistent naming conventions
- ▶ Redundant variables
- ▶ Subtle bugs - wrong variables used
- ▶ limit global vars (none if possible)

Potential Issues: Unforeseen Issues



- ▶ Security issues
- ▶ Blockers further down the road
- ▶ Integration issues

Potential Issues: Adherence to Style and Standards



- ▶ PEP8: Standard Python style guide
- ▶ PEP257: Docstrings
- ▶ Linting for all the things...

PEP8 Linting

```
pip3 install pycodestyle  
pycodestyle filename.py
```

- ▶ **-statistics** how often each error was found
- ▶ **-show-source** shows the source where error occurs
- ▶ **-show-pep8** pulls in the PEP8 text for error

PEP 257 Docstrings

[View Docs](#)

Linting Docstrings

Checking Docstrings

```
pip install pep257  
pep257 PetPEP257.py
```

Review Your Way to Success

"If you're serious about the quality of your work, you'll accept that you make mistakes, seek the counsel of your compatriots in finding them, and willingly review your colleagues' work products. You will set aside your ego so you can benefit from the experience and perspective of your technical associates. When you have internalized the benefits of peer reviews, you won't feel comfortable unless someone else carefully examines any significant deliverable you create."

Karl E. Wiegers - Humanizing Peer Reviews, 2002

PASS Challenge

- ▶ **Format and document** your submission
- ▶ Getting the file and folder structure right is important, it gives assessors more time to focus on useful feedback
- ▶ Then **submit** to the peer-review activity
- ▶ Submissions are group submissions (i.e., your pre-production teams)
- ▶ The submission must be a .zip file

PASS Challenge

- ▶ One folder for each contract
- ▶ Each member of the team should have 'assumed ownership' of one contract
- ▶ Name the folder according to the contract
- ▶ Ensure the name of the 'owner' is included in the folder name
 - ▶ e.g. "Contract 1 - Scott"
 - ▶ e.g. "Contract 2 - Parker"

PASS Challenge

- ▶ Add a README.md file alongside the contract folders
- ▶ Use [Markdown](#) appropriately
- ▶ Describe the project
- ▶ For each member of the team, repeat who assumed ownership of each contract but here also include who else worked on it
- ▶ Then, again for each member of the team, clarify to assessors where the three or more algorithms/function are

PASS Challenge

- ▶ Also add README.md files in each contract folder
- ▶ Use [Markdown](#) appropriately
- ▶ Add a link to the repository used for version control
- ▶ Explain to assessors how to execute the code
- ▶ Add any other details you think necessary
- ▶ Acknowledge and thank contributors to that contract

PASS Challenge

- ▶ Include doc-strings in source files to clarify authorship
- ▶ Where appropriate, credit everyone who contributed and make clear who was driving
- ▶ If equal contributions (due to rotating driver/navigator), say so
- ▶ If present, reference third-party code
- ▶ Supply a link in the doc-string if any code has been taken from StackOverflow