INTRODUCTION TO SOFTWARE DEVELOPMENT

Week 4 Day 3

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for

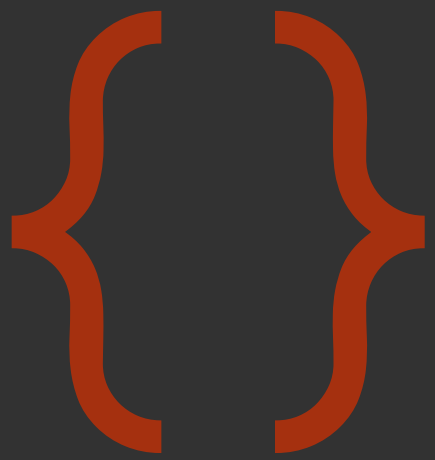
Oakland University

PREVIOUS SESSION REVIEW

QUESTIONS FROM PREVIOUS SESSION?


Disney Photo Snapper


Yesterland.com

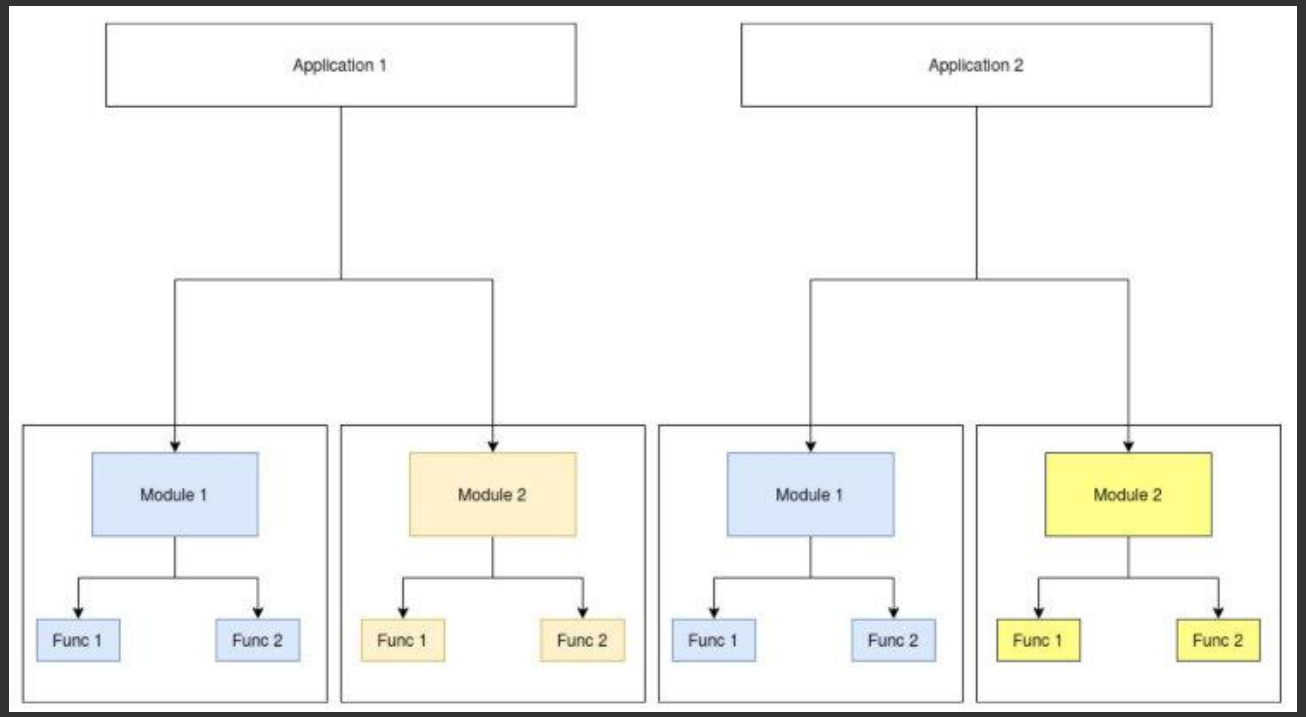


MODULAR CODING

MODULARITY DEFINITION

- the degree to which a system's components may be separated and recombined, often with the benefit of flexibility and variety in use.

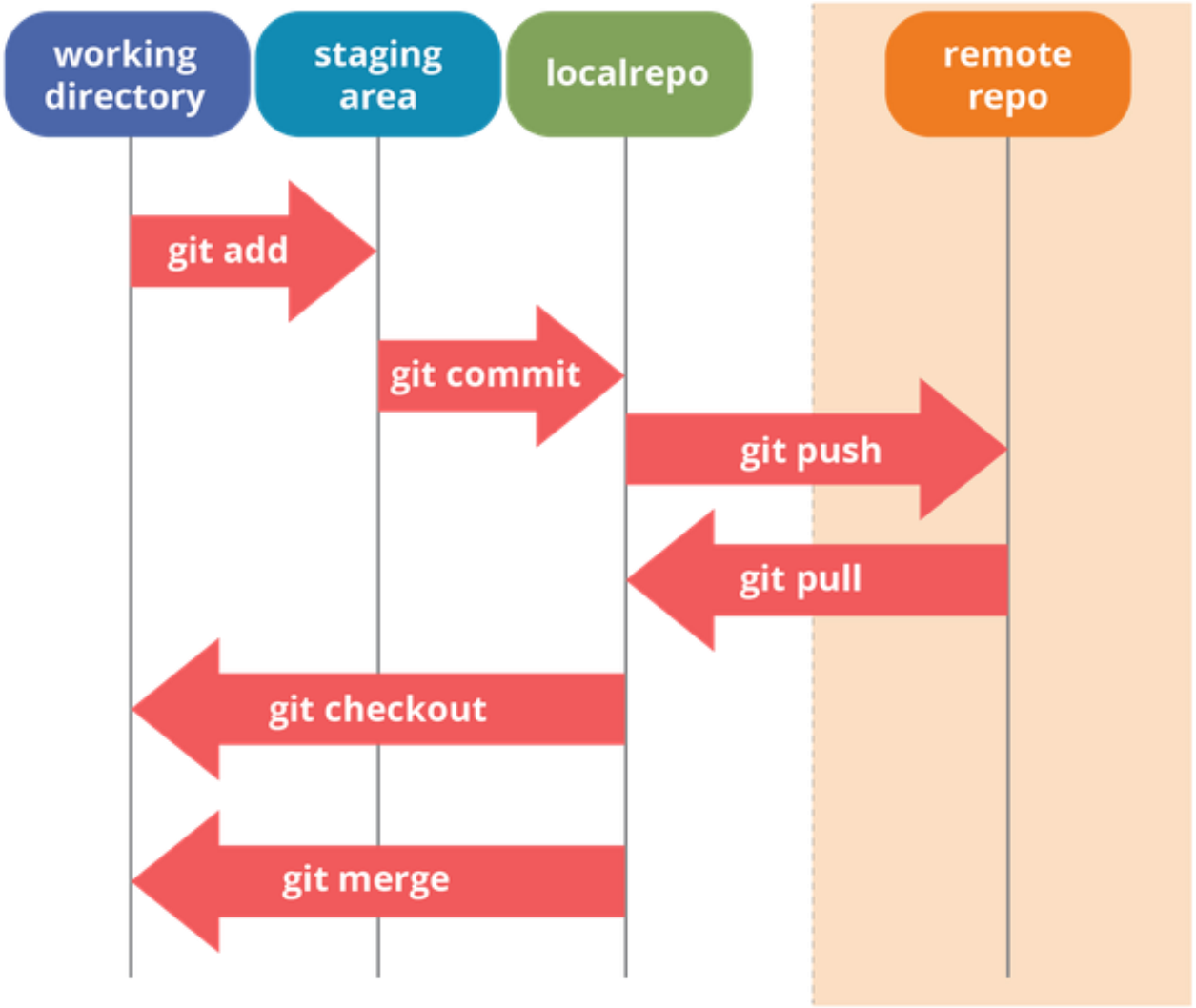
HOW TO PROGRAM MODULARLY



- Equivalent Coding Standards
- Standard APIs
- Reliable frameworks
- Designing for testability

WHY PROGRAM MODULARLY?

- Plug & Play code
- Cheaper
- Easier to build



WORKFLOW REVISITED

BRANCHING WITH TEAMS

BRANCH NAMING CONVENTIONS

- What type of branch naming convention works for you?
- [Username] - <feature>
- [Jira ticket #] - <feature>
- [github issue number] – {username} - <feature>

PULL

FORKING

EDITING A FORKED REPOSITORY

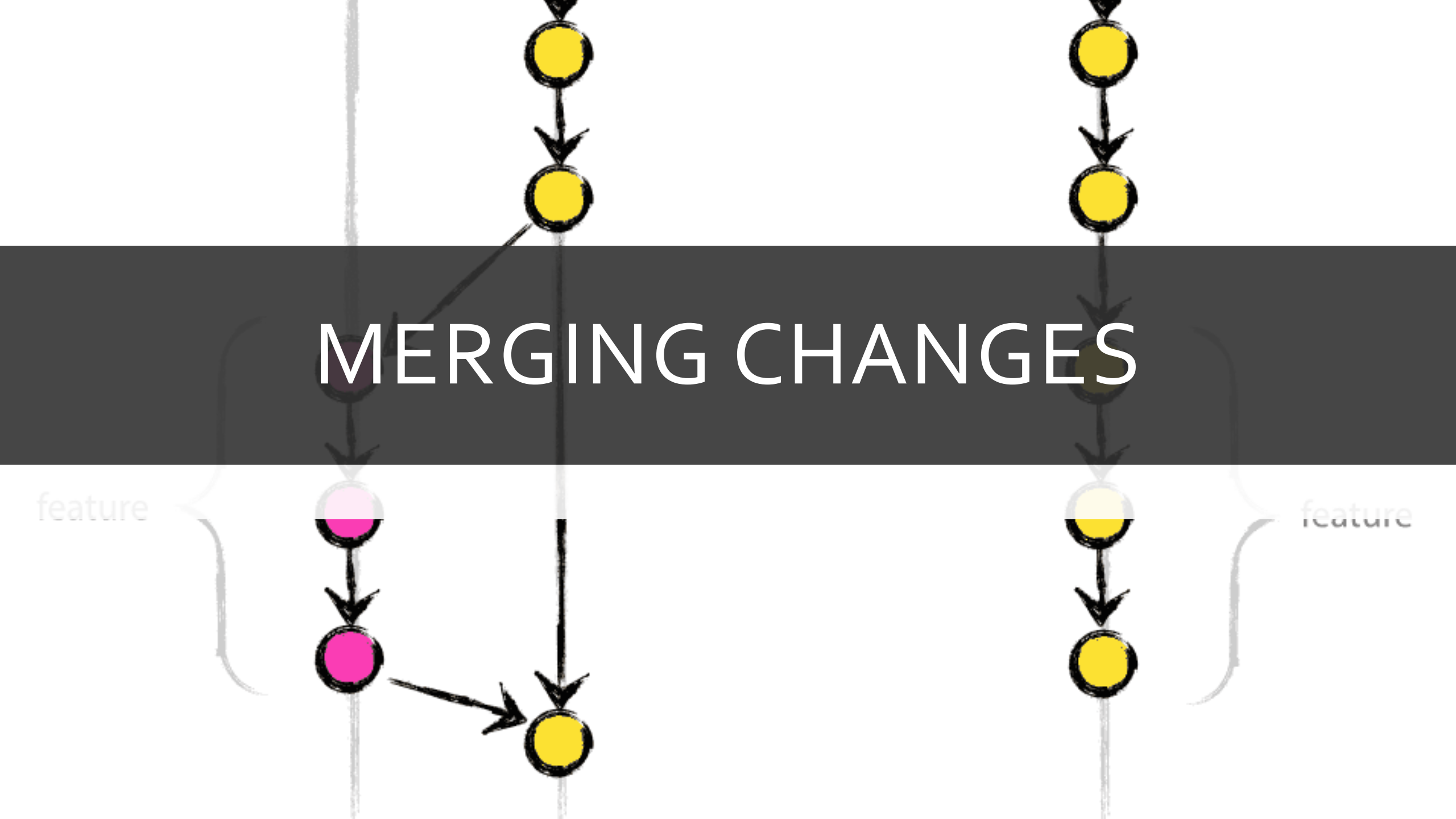
PULL REQUEST

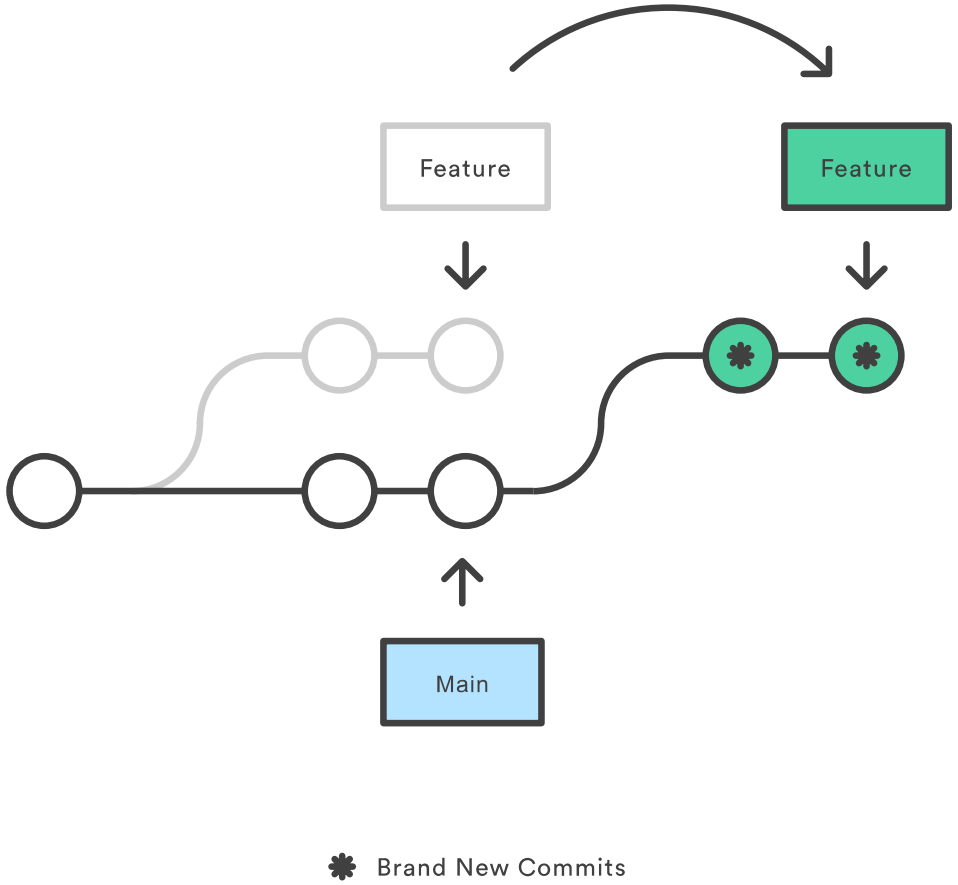
CODE REVIEWS

CODE REVIEW

- Allows changes to be approved
- Limits bad code merges
- Adds a layer of safety

MERGING CHANGES





REBASING

RELEASE CANDIDATES

BUILDING BINARIES

RELEASE NOTES

PRACTICING WITH GIT

- https://learngitbranching.js.org/
- Alternatives
  - https://gitimmersion.com/lab_01.html

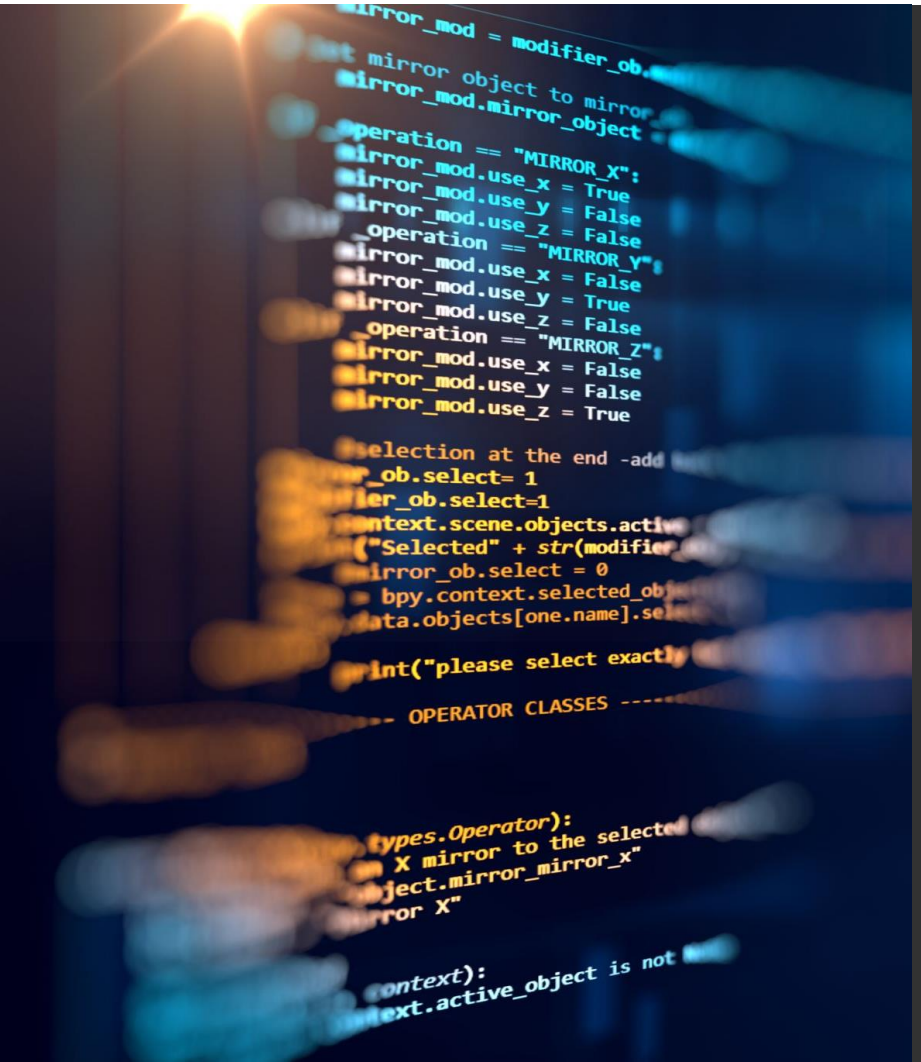
10 MINUTE BREAK

LICENSING

LICENSING

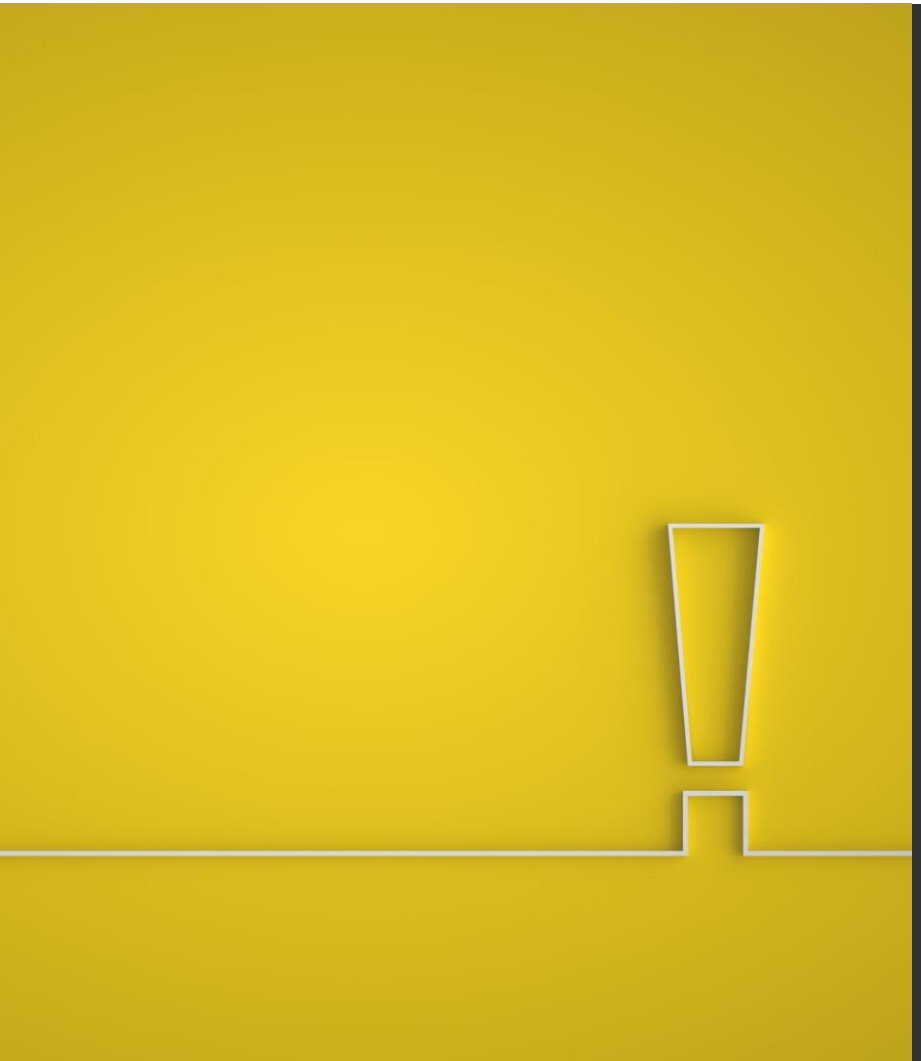
- Software can be copyrighted
- How do we protect our “Intellectual Property”?

BROAD CATEGORIES OF SOFTWARE LICENSING



- Weak Copyleft
- Copyleft
- Commercial or Proprietary
- Dual
- Public Domain

PERMISSIVE



- Permissive
  - Minimally restrictive on modifications or redistribution
  - Typically, only require acknowledgements

WEAK COPYLEFT

- Allows linking to open-source libraries
- Minimal requirements
- Modifying the library is more complicated than permissive
- Examples:
  - Gnu Lesser General Public License (GLPL)
  - Mozilla Public License (MPL)
  - CDDL
  - Eclipse

COPYLEFT

- A.K.A. “Reciprocal” licenses or “Restrictive” licenses
- Not as commercially friendly
- Requires publication of source code for derivative works
  - Not good for commercial products!
- Examples:
  - Gnu Public License (GPL)

MIT

- Allows for unlimited copy, modify, merge, publish, distribution, sublicense and sale
- Designed to encourage software innovation
- Does NOT provide any warrantee, and excludes all liability on the author
- This is my favorite type of license.

COMMERCIAL/PROPRIETARY

- Most restrictive
- Typically used by corporations
- Typically closed source

DUAL

- Differs for different types of users
- Examples:
  - Server-Side Public License (SSPL)

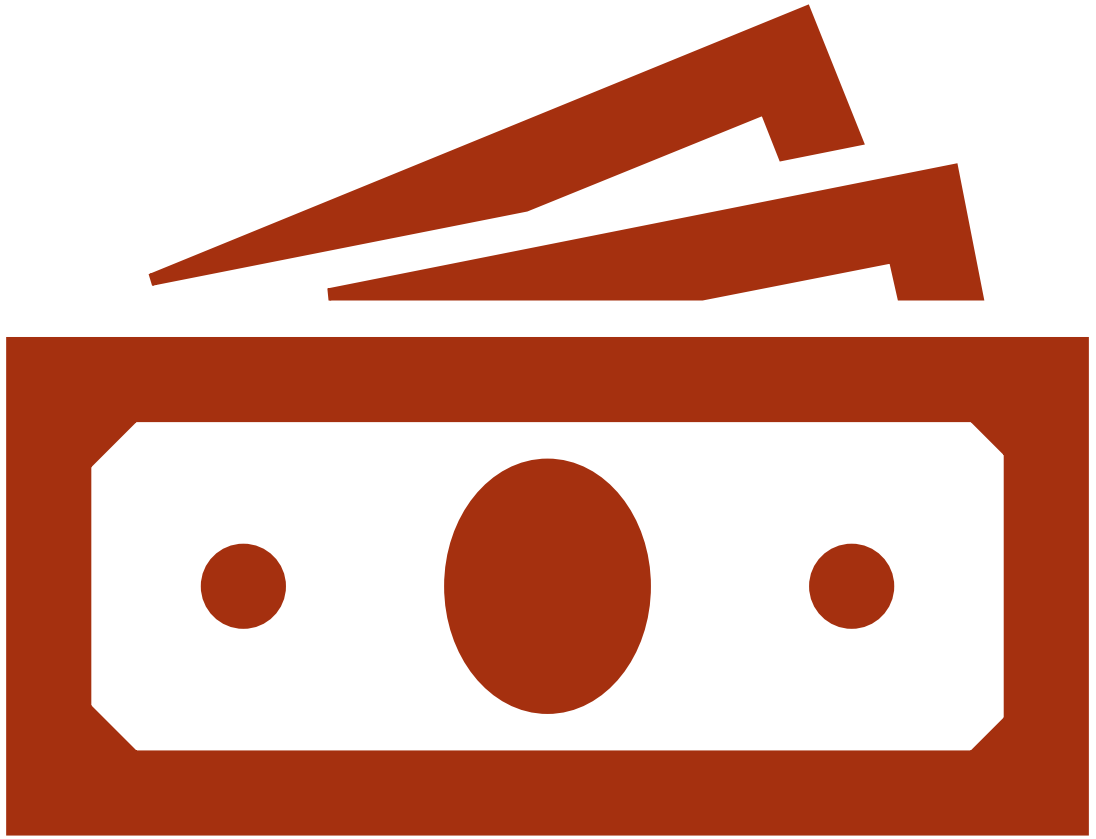
PUBLIC DOMAIN

- Copyright protections do not apply
- Hard to find software in this category
- Most permissive

UNLICENSED

Can be complicated

Can be legally risk

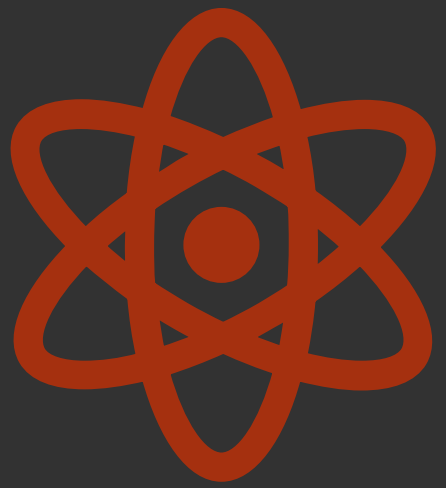


LICENSING CONCERNS

10 MINUTE BREAK

ARCHITECTURE DESIGN

FUNCTIONAL TESTING



WHAT IS THE PURPOSE OF TESTING?

MANUAL TESTING?

Takes longer

Not scalable

Tedious!

AUTOMATED TESTING

What does our testing pipeline look like from an architecture perspective?

What types of tests do we need to perform?

- Regression testing
- QA testing
- User Acceptance Testing
- Load testing
- Performance Testing
- Security Testing

TESTING IN DEPTH

LOAD TESTING

STRESS TESTING

PERFORMANCE TESTING

SECURITY TESTING

UNIT TESTING

- We added a feature!
  - Does it do what it’s supposed to do?
- This should be done for every new feature!

LOAD TESTING

- Average number of concurrent users in the tool at a time
- Beneath "peak" use
- This is the **REGULAR** amount of traffic you expect to get
- Does our app scale with more users? We can test for this!

STRESS TESTING

- **ABOVE** average use
- Uncommon amount of traffic
- Can we load balance?

PERFORMANCE TESTING

- How quickly can we load information?
- Do we see any lags in transfer under regular use?
  - Lags in higher-than-average use?

SECURITY TESTING

- How can we break this app?
  - Can we get access we shouldn't have?
  - Can we get information we shouldn't have?
  - Can we make the app do something unexpected?
- Do we need to fully pentest this app?

PENTESTING?

- Can we do this “in-house”?
- Is there a cost associated with this?
  - Probably!
  - Is doing a pentest worth the cost?
- What if we don’t do a pentest?

PRODUCT PENTESTING OPTIONS

- In-house penetration test (pentest)
  - Do we have the expertise to do this in-house?
- Third-party testing
  - Is there a legal or regulatory reason we should do a third-party pentest?

ARCHITECTURE PENTESTING

- Should we pentest our back-end architecture?
  - Is there a cost associated with this?
    - Probably!

OUTCOMES FROM TESTING

- Bug tickets
- Feature Requests
- Reporting
  - We can show this to regulators!

SESSION REVIEW

QUESTION OR CLARIFICATIONS?

SEE YOU NEXT TIME!