

Collaboration And TDD

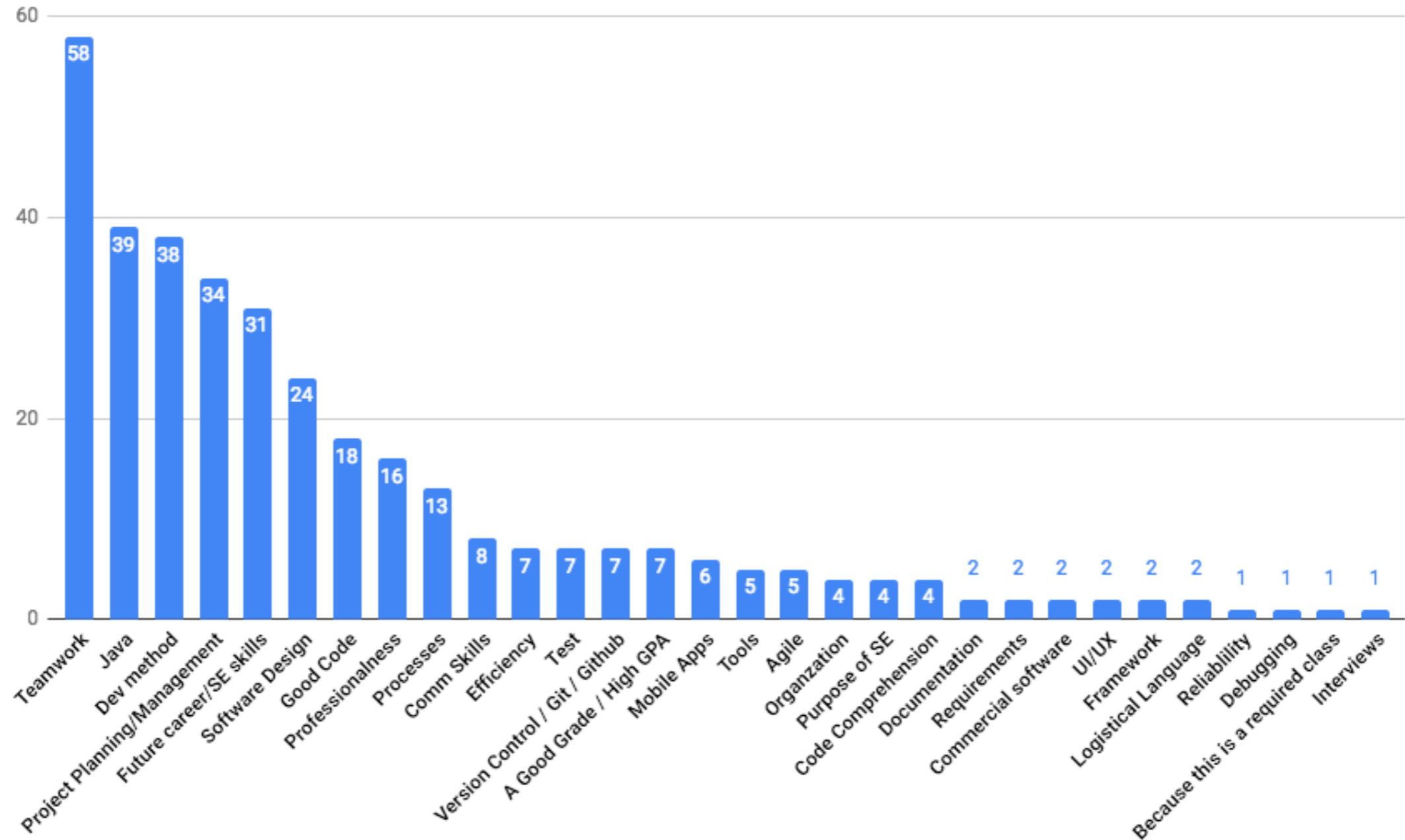
Tuesday, September 25

Announcements

Team formation instructions: <https://cs361fall2018.github.io/assignments/teams/>

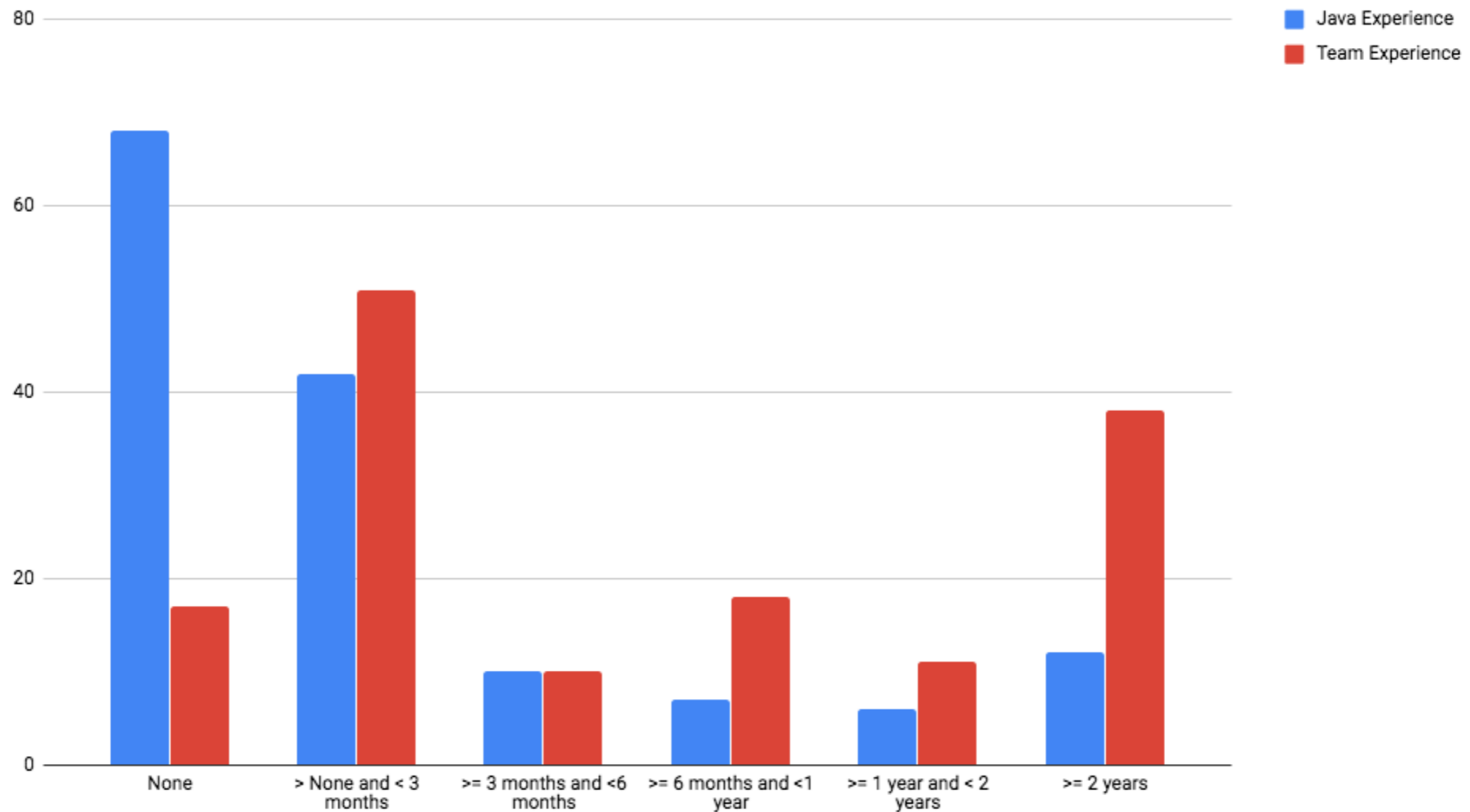
Class resources: <https://cs361fall2018.github.io/resources/>

Class expectations



Experience

Java Experience and Team Experience



Git

Distributed version control system

Each developer has a **copy** of the entire history

Branching and merging is cheap

Supports multiple workflows

Terminology

Commit: A commit, or "revision," is an individual change to a file (or set of files).

Branch: A branch represents an independent line of development

Master: The default development branch

Merge: Merging takes the changes from one branch, and applies them into another.

Head: Git's way of referring to the current snapshot.

Terminology

Fetch: getting the latest changes from an online repository without merging them in.

Pull: Bringing in changes from a remote repository to the local one.

Push: Sending your committed changes to a remote repository

Index: Files are about to be committed.

Using git locally

git clone: clones a repository on your local machine

git add: adds file to the index/staging area

git commit: commits the files in the index/staging area

git checkout <name>: checkout out the branch or commit

git checkout -b <branch>: creates a new branch and checks it out

Using git locally

git branch: lists the branches

git branch <name>: creates a new branch and does not check it out.

git pull: pulls in changes from the remote repository

git push: pushes changes to the remote repository

GitHub

Hosting service for version control using Git

It's the other part that makes Git awesome

Has builtin project management and collaboration tools

GitHub team workflow

How do you use Git and GitHub effectively when working in teams?





cs361fall2018/sprint1



teamX/sprint1 is also known as **"upstream"**



cs361fall2018/sprint1

teamX/sprint1 (origin) master

git clone

local master





cs361fall2018/sprint1

teamX/sprint1 (origin) master



local master

is1

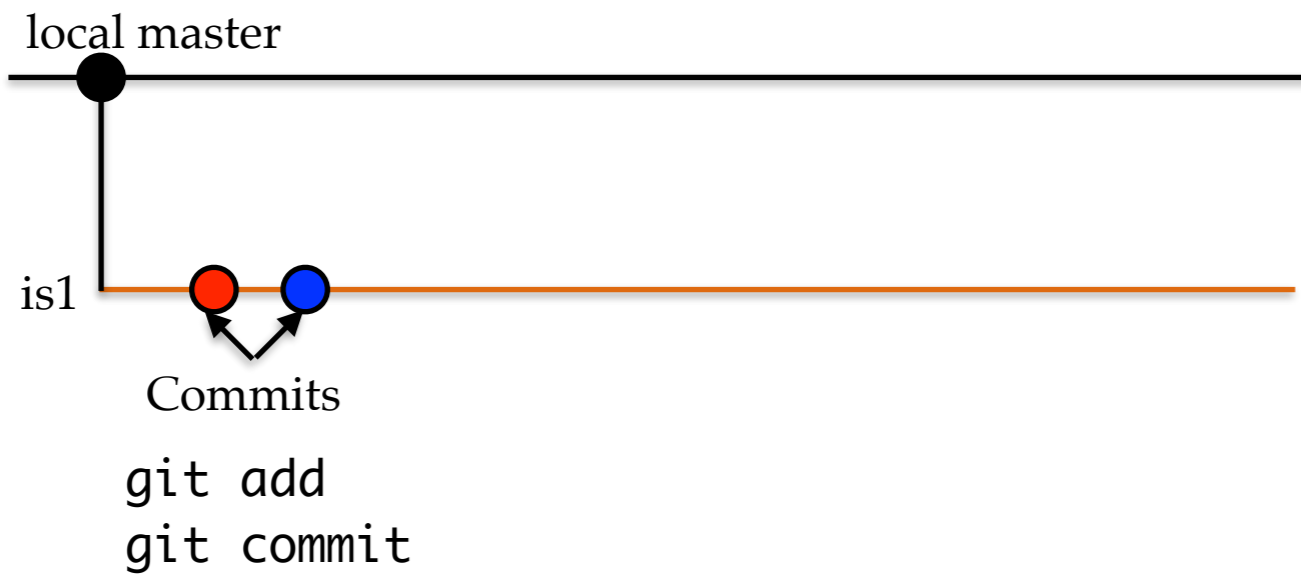
git checkout -b is1

Naming branches using the issue number makes it easier to manage/identify them.



cs361fall2018/sprint1

teamX/sprint1 (origin) master



Commit early and often



cs361fall2018/sprint1

teamX/sprint1 (origin) master



local master

is1





cs361fall2018/sprint1

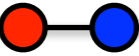
teamX/sprint1 (origin) master



local master

git checkout master

is1





cs361fall2018/sprint1

teamX/sprint1 (origin) master



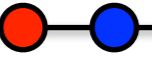
git pull



local master



is1





cs361fall2018/sprint1

teamX/sprint1 (origin) master



local master



is1



git checkout is1



cs361fall2018/sprint1

teamX/sprint1 (origin) master



local master

is1



An alternative is to use **git rebase**. This will produce the same result, but the history will be cleaner.



cs361fall2018/sprint1

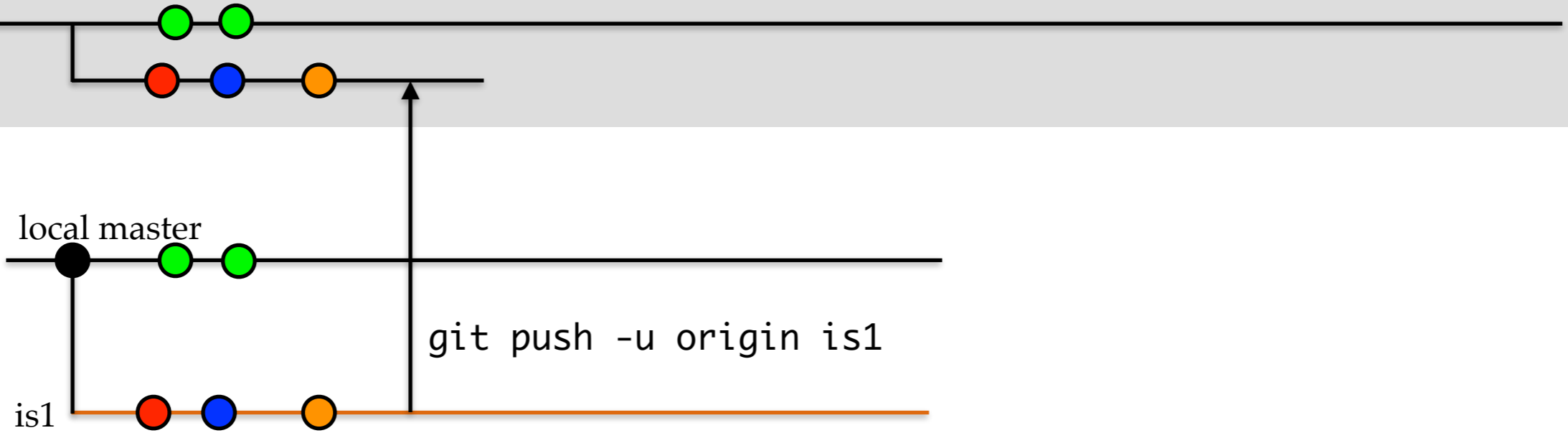
teamX/sprint1 (origin) master



local master

is1

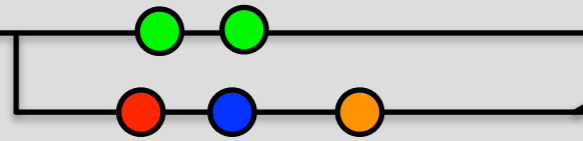
git push -u origin is1





cs361fall2018/sprint1

teamX/sprint1 (origin) master



Open a Pull Request & Request reviews



local master

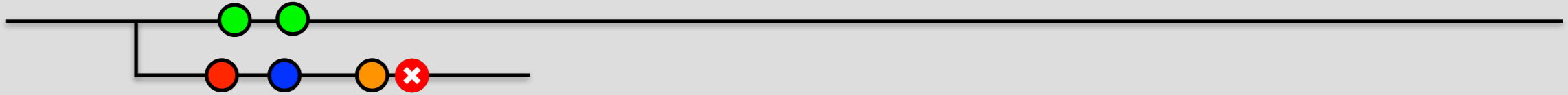


is1



cs361fall2018/sprint1

teamX/sprint1 (origin) master



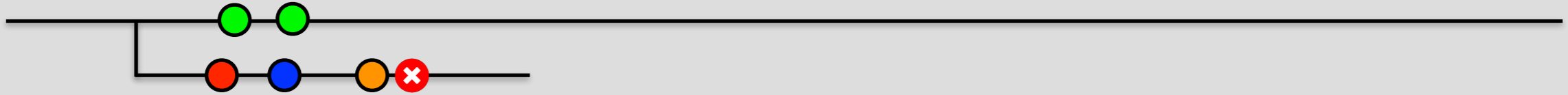
local master



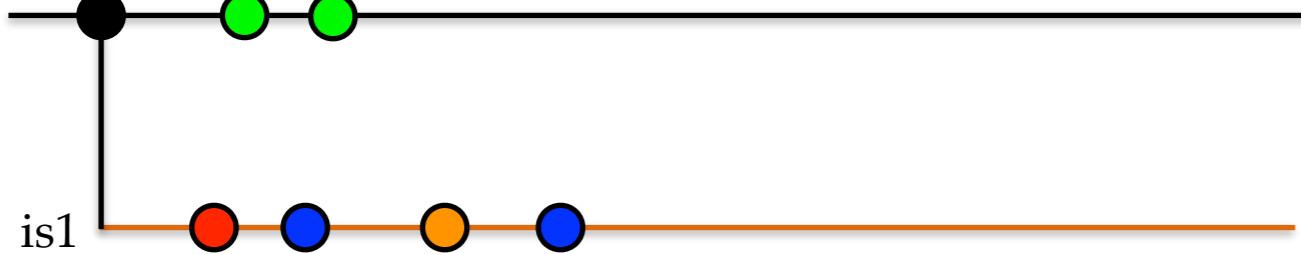


cs361fall2018/sprint1

teamX/sprint1 (origin) master



local master

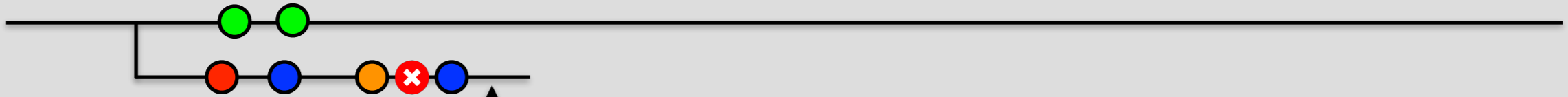


Implementing review feedback

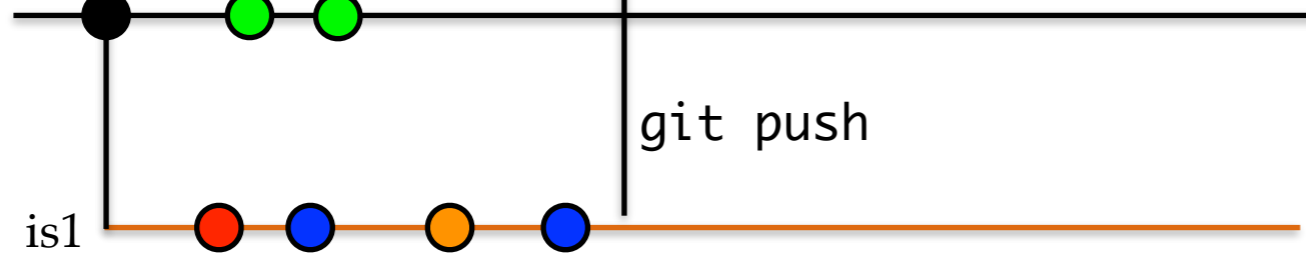


cs361fall2018/sprint1

teamX/sprint1 (origin) master



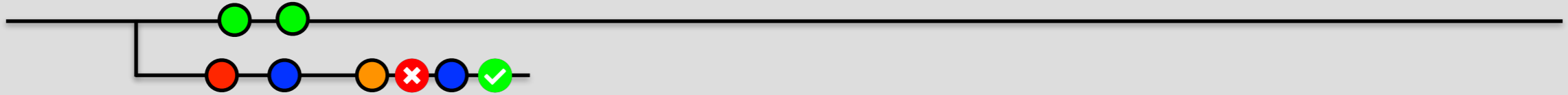
local master



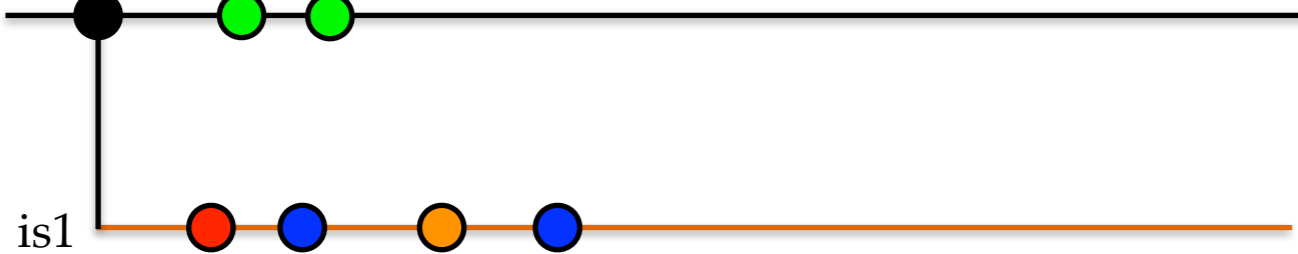


cs361fall2018/sprint1

teamX/sprint1 (origin) master



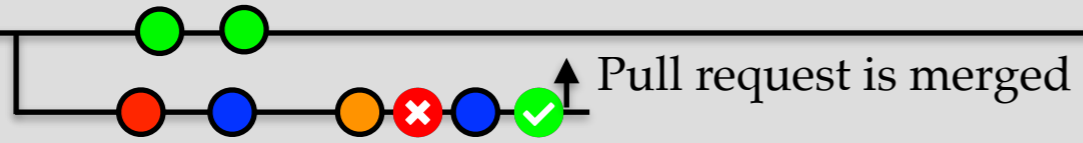
local master



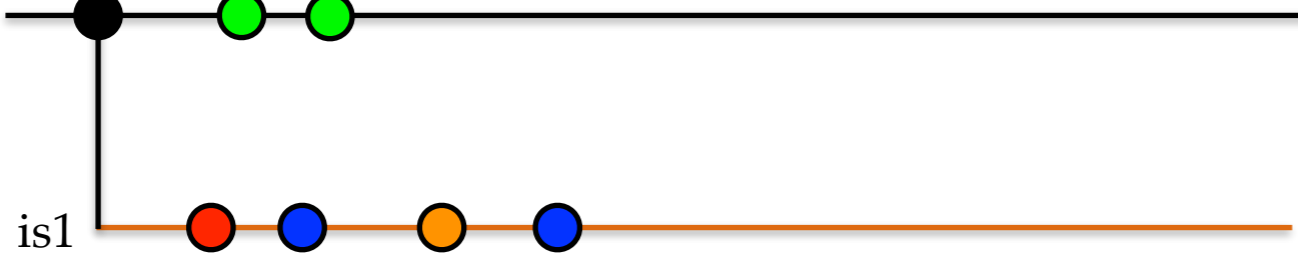


cs361fall2018/sprint1

teamX/sprint1 (origin) master



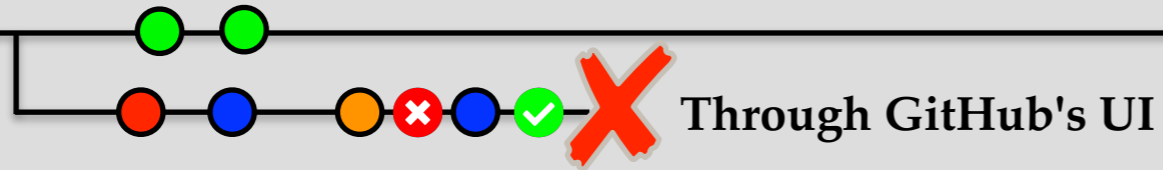
local master



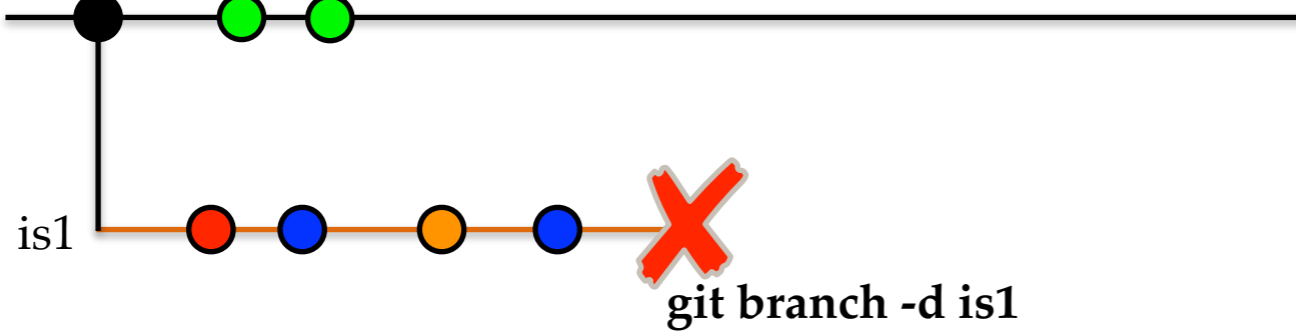


cs361fall2018/sprint1

teamX/sprint1 (origin) master



local master



The master branch

It contains the "truth."

Milestone tags

Deployment branch

All code merge into the master needs to be **reviewed**

GitHub issues

Issues allow you to **plan** and track your work.

Write a **clear explanation** for each issue. If it's a user story, write the whole story as the description.

Tag the issue with a **label**, and a milestone.

Assign the issue

Close it by referencing the issue number (#) in the PR.

Short demo

Proper collaboration will
be part of all project
sprints

Test Driven Development

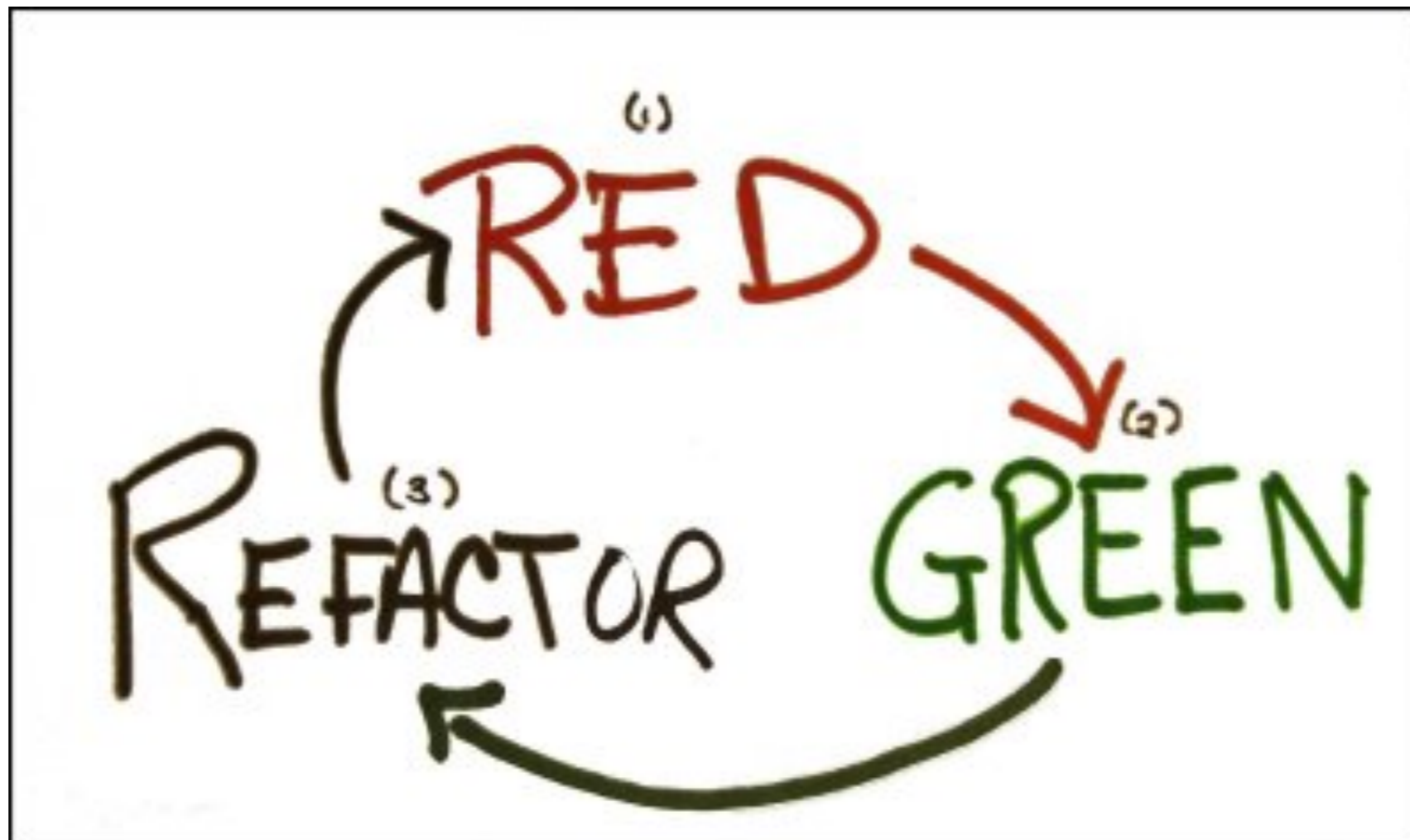
What is TDD?

A software development cycle that is based on 3 simple rules:

1. You must write a failing test before you write any production code;
2. You must not write more of a test than is sufficient to fail, or fail to compile;
3. You must not write more production code than is sufficient to make the currently failing test pass;

<https://blog.cleancoder.com/uncle-bob/2014/12/17/TheCyclesOfTDD.html>

TDD cycle



Why TDD?

The act of writing a unit test is more an act of design than of verification.

It is also more an act of documentation than of verification.

The act of writing a unit test closes a remarkable number of feedback loops, the least of which is the one pertaining to verification of function.

-Robert C. Martin (Uncle Bob) in Agile Software Development, Principles, Patterns, and Practices

Personal experience

Clear place to start

Much less code thrown away

Less hassle with I/O

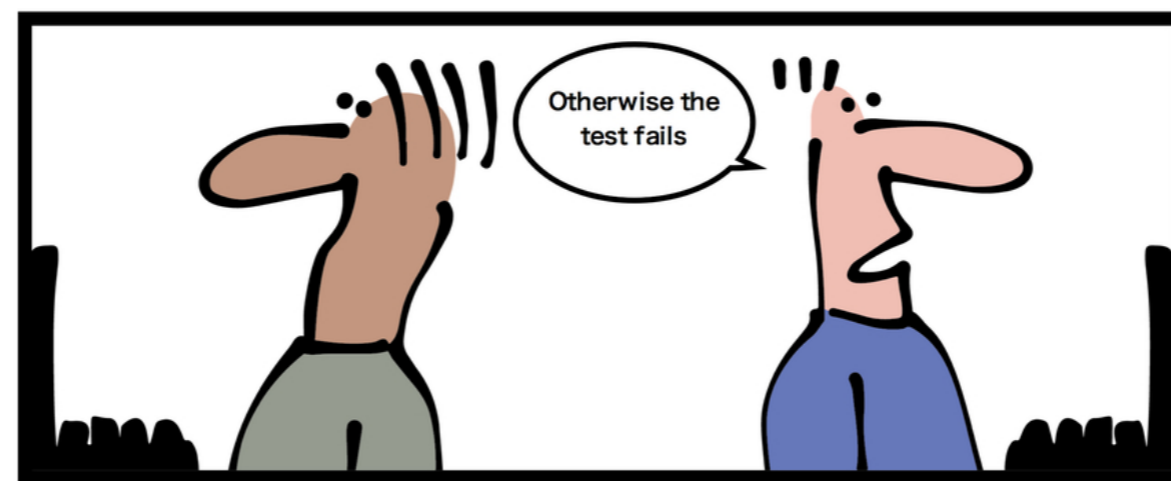
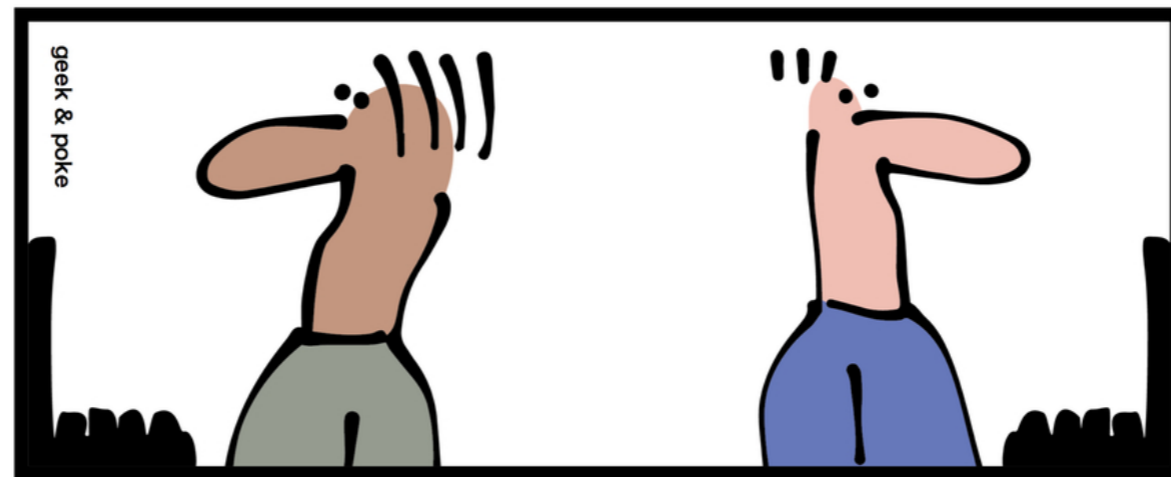
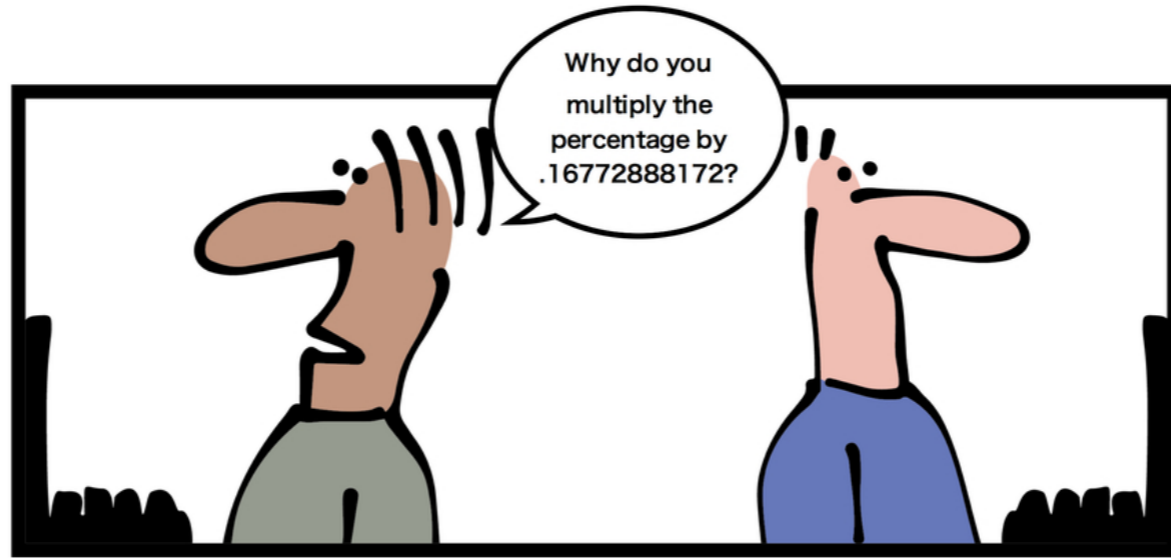
Less fear

Downsides of TDD

Reliant on tests running quickly

No overarching design

Tests require extra maintenance effort



TDD

TDD Demo

Scoring Bowling

1	4	4	5	6	▲	5	▲	■	0	1	7	▲	6	▲	■	2	▲	6
5	14	29	49	60	61	77	97	117	133									

The game consists of 10 frames as shown above. In each frame the player has two opportunities to knock down 10 pins. The score for the frame is the total number of pins knocked down, plus bonuses for strikes and spares.

A spare is when the player knocks down all 10 pins in two tries. The bonus for that frame is the number of pins knocked down by the next roll. So in frame 3 above, the score is 10 (the total number knocked down) plus a bonus of 5 (the number of pins knocked down on the next roll).

A strike is when the player knocks down all 10 pins on his first try. The bonus for that frame is the value of the next two balls rolled.

In the tenth frame a player who rolls a spare or strike is allowed to roll the extra balls to complete the frame. However no more than three balls can be rolled in tenth frame.