
Lab 2: Intro Material

Software Engineering and Pair Programming

Notes for CSC 100 - The Beauty and Joy of Computing
The University of North Carolina at Greensboro

Question to think about....

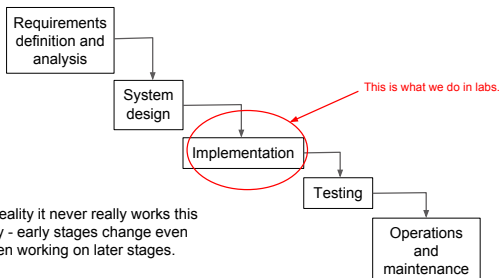
In these labs you are writing programs

How does this relate to professional software development?

Software Engineering

How to control the complex process of creating software

Traditional "software lifecycle" has well defined phases that feed into each other one-way - called the "Waterfall Model"

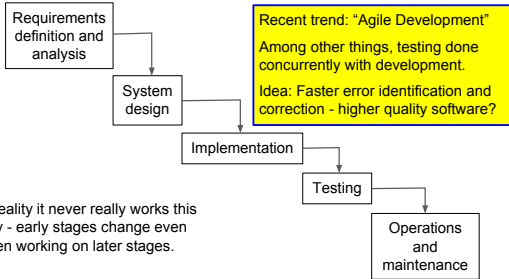


In reality it never really works this way - early stages change even when working on later stages.

Software Engineering

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Peer Reviews and Pair Programming

Two ideas for software development...

Peer Reviews: At regular intervals, a developer presents and explains their code to co-workers, who critically review code. Similar to a writer going over drafts with an editor.



Pair Programming: Development is actually a collaborative activity - pushes "review" so far back that it is simultaneous with development!

Pair Programming for Learning

From August 2013 *Communications of the ACM*:

Plug: Don't forget our UNCG ACM chapter!

DOI:10.1145/2480002.2480002 Leo Porter, Mark Sudrajat, Charles McDowell, and Beth Simon

Education Success in Introductory Programming: What Works?

How programmatic, peer instruction, and code computation have improved computer science education.

Many computer science faculty members have been successful in teaching introductory programming courses. The computer science major (CS1) is the most common first-year course in computer science. There are usually as many as 100 students in the course. It is a challenging course for many students, but it is also a course that many students enjoy. We do, and we have research on this. We have found that pair programming, peer instruction, and code computation are three approaches to teaching CS1 that have shown positive, measurable impacts. Each of them is an example of a programmatic, peer instruction, and code computation approach. We have a research office.



prints and learned the material from the lecture. The idea is to have two people at a computer, one is the "driver" and the other is the "navigator" or "navigator". The two people at the computer work together to solve the problem. They have a research office.

the students for one year after the first quarter course. The final data were students passed in the pairing course (70% versus the non-pairing course (67%)) and they were more likely to have students at the end of the course (70% versus 67%). The study included all lines of code, are included on how early a program was written.

Surprise!

We don't do pair programming because we like to torture you and stick you with terrible partners.

We do it because it helps people learn!

Pair Programming: What to do

Really simple concept:

- Two students, one computer
 - Roles: "Driver" and "Navigator"
 - Driver has keyboard/mouse, but navigator describes how to build solution
- Both students always active
 - *Not "Driver" and "Sleepy passenger"*
- Switch roles regularly
 - At least once per lab activity, if not more often
- Be open and respectful
 - If you don't like a proposed solution, your job is to either explain why it's not a good solution or to make the case for a better one - don't just dismiss it!

Handout: "Fun with Pair Programming!"

Details of Pair Programming in CSC 100

At the beginning of lab:

- Check partner/workstation information sheet posted on lab door
- Find your workstation
- If you don't know your partner, introduce yourself!
- Only one of you will log in to the workstation - decide which one (maybe first to sit down?) and log in to Snap! Cloud account
- If your partner is a no-show by 10:02, let the instructor or lab assistant know

Submitting your work:

- Submit activities as usual through "The G"
- One of you logs in to Canvas and enters names that worked together
- Everyone still does the quiz individually (before the next class)
