

Developing Interactive Web Tools for Statistics Students

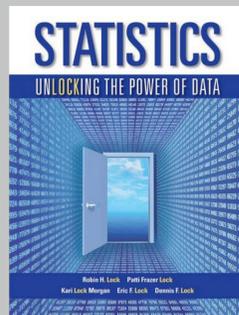
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Background

As computing capabilities continue to grow in both power and availability, software developers work with clients to create tools to keep up with advances in computing and in the client disciplines.

This project focused on developing a web-based package of statistical simulation and representation software for Professors Patti Frazer Lock and Robin Lock. The software, known as StatKey, accompanies their textbook *Statistics: Unlocking the Power of Data* (Wiley 2012), and is used in the Math 113: Applied Statistics course.

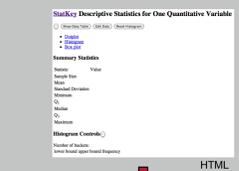


Web Programming

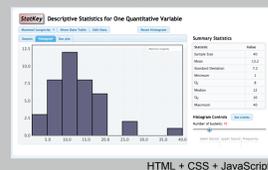
To provide functionality, clarity in design, and computing power, web-based applications typically make use of three core technologies: *HTML*, *CSS*, and *JavaScript*.

HTML

is used to provide the static **content** of a web page.



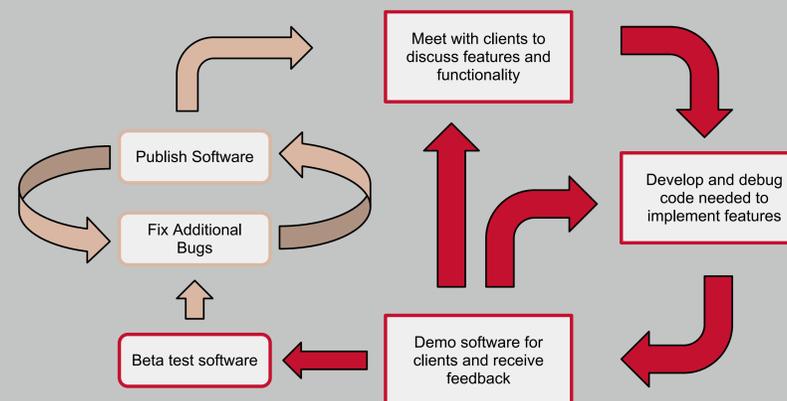
CSS determines the **style** and **position** of content on a web page. This is where colors, fonts, and layout of a web page are controlled.



JavaScript adds additional **functionality** to a web page. It manipulates *HTML* and *CSS* to provide an interactive user experience, making web applications possible.

Development Cycle

Software development is an iterative process. With each iteration, the quality and functionality of the software improves. The cycle begins with an initial client-developer meeting, but additional developers may join at any point.



Maintaining Source Code

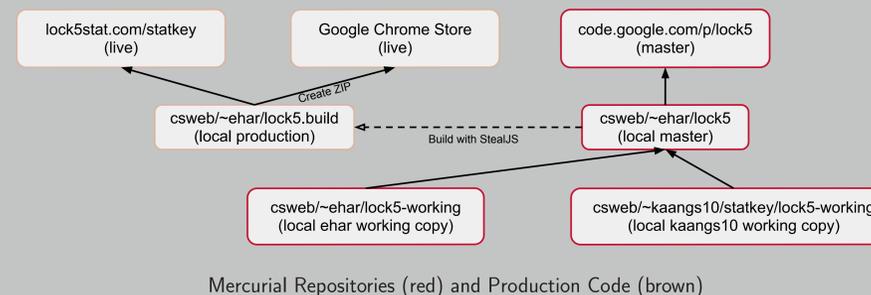
When two or more people work together on a programming project, keeping track of files becomes more difficult.

Question: What happens if two programmers work separately on the same file?



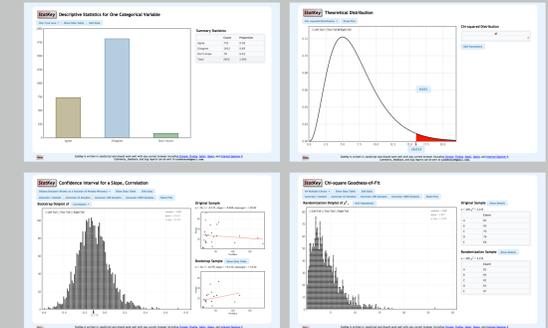
Solution: Use *Version Control*. Each user works on his or her own copy of the files, called a *repository*. Version control software (such as Mercurial) tracks changes made to these files and keeps files in separate repositories consistent with each other.

The code stored in the Mercurial Repositories for StatKey is spread across many files and geographic locations, and StealJS is used to compress and combine these files into a production version. This speeds up downloads and obfuscates the code to protect it.



Effective Software Design

► Maintain consistency in appearance across all pages



- Avoid repeating code in multiple pages
- Use adapters and façades to unify resources
- Provide basic functionality for all major web browsers

Resources

- jQuery (<http://www.jquery.com>)
 - jQueryUI (<http://www.jqueryui.com>)
 - Flot (<http://www.flotcharts.org>)
 - jStat (<http://www.jstat.org>)
 - StealJS (<http://javascriptmvc.com>)
 - Mercurial (<http://mercurial.selenic.com>)
- *All resources used for this project were free and open source.

StatKey on the Web

StatKey is hosted at <http://lock5stat.com/statkey> and may also be downloaded from the Google Chrome Web Store. The source code is hosted in a Google Code project.

Acknowledgements

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