Developing shiny applications for the classroom

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The **shiny** package (RStudio, 2013) provides a flexible framework for developing web applications using *R* and holds potential for use in teaching in a variety of settings. **shiny** allows *R* users to develop interactive applications customized to the specific teaching application and data source without specialized knowledge of web development. Its web-based deployment allows these programs to be accessible on any devices with web access, not requiring software installation. By minimizing the gap between teacher and software developer, **shiny** allows *R* users to directly bring statistical concepts to students in cases where a deeper understanding of programming or statistical software is not feasible or desired.

We illustrate its use in teaching with case studies, including an application for data linearization developed for the physics classroom (Griffith & Lerner, 2014) using the **shiny**, **shinyIncubator**, and **ggplot2** packages. This was prompted by hands-on lab assignments requiring students to collect and enter experimental data, graphically display both raw and model-based visualizations of the data in conjunction with a variety of possible transformations, and grasp concepts of uncertainty. Although many general mathematics and statistical tools exist with similar functionality, none were tailored to the specific audience and available on a web-based platform. We quickly developed a **shiny** application to achieve these needs and piloted it in the classroom. Students found the application intuitive and easy to use. Based on observation and feedback, we were able to rapidly make changes to the application for use in subsequent lab sessions.

References

RStudio and Inc. (2013). shiny: Web Application Framework for R. R package version 0.8.0. http://CRAN.R-project.org/package=shiny

Griffith SD and Lerner M (2014). Physics linearization web app (available at http://spark.rstudio.com/sgriffith/lerner/).