Shiny Demos of Statistical Modelling

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In teaching statistical modelling, particularly to students with little mathematical background, it can be helpful to visualise properties of the model and associated statistics. Rather than producing several static visualisations, interactive or dynamic visualisations enable a number of concepts to be illustrated on the same data set. Furthermore, dynamic visualisations can be used to explore differences between data sets or alternative parameter settings.

Some interactive demos to illustrate ordinary least squares regression are available in the CRAN packages **rpanel** and **TeachingDemos**, implemented via Tcl/Tk and base graphics respectively. Both require a small amount of R code to set up the demo for a particular data set, which is unlikely to be a problem for the instructor but makes the demos less accessible to students without knowledge of R. In this talk we present our work on the development of statistical modelling demos using Shiny. Shiny provides a platform to implement R-based web apps, that may be accessed by students on their mobile computing devices via a browser.

Our initial focus has been on simple linear regression, where many fundamental concepts can be illustrated. The `linreg` app explores the optimisation process using absolute or quadratic loss functions and illustrates the fitted line, (squared) residuals, and fitted density in two or three dimensions. Several well known data sets that are often used in introductory courses are made available in the app, such as the `anscombe` data sets. The `linreg` app is hosted on a Shiny Server at the University of Plymouth and is publicly accessible at http://141.163.66.244:3838/linreg/ (a domain name is forthcoming). Further demos for more complex models, such as Poisson regression models, are in the pipeline and developments can be tracked in the GitHub repository: https://github.com/hturner/shiny-demos.