Using Stan to Estimate Hierarchical Bayes Models
AMA ART Forum Tutorial
June 25, 2017

Welcome to the AMA ART Forum workshop on Using Stan to Estimate Hierarchical Bayes Models. In this hands-on tutorial, we will show how to use Stan to fit popular models in marketing including the hierarchical choice models typically used for conjoint and a nested logit model for the no-choice option.

This will be a hands on workshop and users are encouraged to bring a laptop and follow along. Stan is a stand-alone program that can be accessed from R (and several other languages like Python or Matlab, or even the command line). To run the code for the tutorial, you will need to install three (or four) programs: the R statistical language, RStudio (an environment for R), the Stan program and a C++ compiler that interfaces wiht R (if your system doesn't have one). R, RStudio and Stan are open-source, which means they are maintained by a collective of voluntary contributors and can be downloaded for free, but the installation process can sometimes be confusing. Please follow the directions below carefully. It will take about an hour to through the process.

Once you have R, RStudio, a C++ compiler and Stan installed, you will be ready to start the workshop. The slides and code for the workshop will be provided online in a GitHub repository, but we are still furiously working on it and will send a link as soon as we can. We'll start the workshop with a quick overview of the repository and then get into the R and Stan code.

Installation Instructions for R, RStudio and Stan

1. Download & install the R software
Windows Users: Go to http://cran.r-project.org/bin/windows/base/. Click on 'Download R 3.4.0' link in the top-left-hand-corner of the screen. Download and run the Application file.
Mac Users: Visit the R for Macs Download website: http://cran.r-project.org/bin/macosx/. Click on the link which corresponds to your operating system (i.e., Snow Leopard, Mavericks) and run the application file. Step 3 below will probably be simpler if you avoid R-3.4.0 and instead go with R-3.3.3, as the former depends on a compiler version and library different from the standard Mac versions.

In the installation process, use all default options. Once installation is complete, R should be listed as a program on your computer and you can run the base R package. Stan only works with the latest version of R, so if you have an older version of R, please update it.

2. Download and install RStudio
RStudio is an add-on interface for R that provides a lot of additional handy features. While it is possible to follow the workshop using base R, the workshop instructors will demonstrate in RStudio. So, if you want to follow along exactly, it is a good idea to download RStudio.

You can download the free desktop version of RStudio at https://www.rstudio.com/products/rstudio/download3/. The installation is straightforward. Note you must have base R installed before installing RStudio.

3. Install RStan

Running Stan requires that your system have a C++ compiler installed and linked to R. The links below provide detailed instructions on how to get this setup and then how to install RStan. Follow the directions carefully!

Mac or Linus Users: Follow instructions at
https://github.com/stan-dev/rstan/wiki/Installing-RStan-on-Mac-or-Linux

Windows users: Follow instructions at
https://github.com/stan-dev/rstan/wiki/Installing-RStan-on-Windows