

This zip archive contains the R/Stan scripts and summary output for the monograph “Stochastic Loss Reserving Using Bayesian MCMC Models - 2nd Edition.

The model scripts, e.g. Mack.R and CSR.R, correspond to the various models described in the monograph. They all have a similar structure which is as follows.

1. Various utility functions, e.g. read in the data from the CAS Loss Reserve Database and plotting functions, etc.
2. A long character variable with the Stan scripts.
3. Initialization functions and compiling the Stan code. Doing this in advance speed up the execution when fitting the models multiple times.
4. All of the Bayesian MCMC models have a function titled “model_function.” This function takes as input the data, the insurer group code and, when appropriate, the loss type (paid or incurred). At a high level it:
 - 4.1. Extracts the data for the particular insurer group.
 - 4.2. Creates the stanfit object.
 - 4.3. It uses the parameters created by the stanfit object to create “statistics (or objects) of interest.”
 - 4.4. It then puts the interesting objects in a list for output.
5. It then calls that function with a statement like “co_model=model_function{,,,}.” The output objects can be used to call residual plots, print tables of put summary statistics into a file. This step starts toward the bottom of the script.

The above steps describe the Bayesian MCMC models pretty succinctly. The dependency and risk margin scripts follow the same general logic, but are more complicated. This particular setup works well when you want set your computer to do multiple runs, and you go and do something else.

If you install the required R packages and put the CAS Loss Reserve Database files into your assigned directory, the scripts should run as is.

The zip archive also contains a spreadsheet with summary output for the various models for the 200 loss triangles, or the 119 pairs of loss triangles for the dependency model.