

Questions for the Course on Bayesian Modeling

EJ Wagenmakers

Below are sets of questions that you'll be graded on. In order to answer these questions correctly and pass the course you will find it necessary to work through the chapters that the questions pertain to.

Exercises Chapter 6

Print out your answer to the exercise below and bring it with you next Wednesday. Before you concentrate on the exercises first work through chapter 6, up to and including section 6.4.

1. Consider the script **TwoCountryQuiz.txt** on page 86. The order-restriction $\alpha \geq \beta$ is implemented as $beta \sim d_{unif}(0, alpha)$. This intuitive approach is problematic. First, describe the problem (hint: page 131, Figure 9.4). Second, search online to find a satisfactory solution. NB: You are not allowed to use the solution described on page 131.
2. Read the Efron & Morris paper on Stein's paradox. You can find it in the BB folder, under "course materials". Describe the conceptual link between the James-Stein estimator and the result from Bayesian hierarchical modeling.
3. Here is a concrete problem in need of a solution. Assume that every year, each ResMas student can nominate a teacher for the much coveted "best teacher award". Currently, the award goes to the teacher with the most votes. Perhaps, you may think, it is a good idea to select the best teacher using a *hierarchical Bayesian model*. Write a letter to Sanne Bentvelzen in which you explain what is wrong with the old method, and how your new method works, from a conceptual point of view. No more than 1 A4 please.