

### Some example questions for practice:

1. Explain the following terms or concepts by using an example:
  - 1.a Prior and posterior probability.
  - 1.b Conjugate priors.
  - 1.c Elicitation of prior probability.
  - 1.d Anchoring (in prior elicitation process).
  - 1.e Epistemic and aleatory uncertainty.
  - 1.f Probability density function for transformation of random variable.
  - 1.g Bayes formula.
  - 1.h Combining individual expert knowledge: sum of prior densities versus product of prior densities.
  - 1.i Interpretation of 'weight' of prior distribution in terms of 'prior sample size'.
  - 1.j Posterior mean as a weighted average of data and prior mean.
  - 1.k Informative prior.
  - 1.l Uninformative prior.
  - 1.m Improper prior.
  - 1.n Bayes-Laplace prior, Jeffreys' prior, Haldane's prior (in binomial model).
  - 1.o Credible interval.
  - 1.p HPD interval.
  - 1.q Posterior predictive distribution.
  - 1.r Prior predictive distribution.
  - 1.s Law of total expectation and total variance.
  - 1.t Prior odds and posterior odds of a hypothesis.
  - 1.u Bayes factor.
  - 1.v Censored data.
  - 1.w Full likelihood.
  - 1.x Modal approximation of posterior density.
  - 1.y Marginal posterior distribution.
  - 1.z Monte Carlo approximation of a distribution.
  - 1.a' Monte Carlo sample mean of indicator variable as an approximation of  $P(\theta < a)$ .
  - 1.b' Gibbs sampling.
  - 1.c' Full conditional distribution.
  - 1.d' Burn-in period.
  - 1.e' Initial value of MCMC sampler.
  - 1.f' DAG.
  - 1.g' Stochastic node in a DAG.
  - 1.h' Deterministic node in a DAG.
  - 1.i' BUGS code as declarative language.

- 1.j' Relationship between a DAG, Bayes formula, and BUGS.
- 1.k' Identifiability.
- 1.l' Standardization of covariates in linear model.
- 1.m' Posterior predictive distribution from linear model.
  
- 2. Solving some conditional probabilities, such as questions 1 & 2 in the first exercises: 'Given that Jack survived, what is the probability that the island was...'
  
- 3. Solving posterior distributions and/or posterior probabilities when conjugate priors are used, for the common standard distributions.
  
- 4. Explaining how to construct a Gibbs-sampling algorithm for a given joint distribution.
  
- 5. Explaining how to write a BUGS code for a given mathematical description of a posterior distribution.
  
- 6. Basically, questions similar to those in exercises.