Homework II (Option A)

- Choose a (possibly big) data set from a certain random variable.
- Assume a parametric model for this variable with a conjugate prior, e.g.:
  - Binomial data with a Beta prior for the success probability.
  - Poisson data with a Gamma prior for the mean.
  - Exponential data with a Gamma prior for the rate parameter.
  - Normal data with a normal-gamma prior for the mean and precision.
  - etc.
- Obtain the posterior distribution for the model parameters and the predictive density. These can be found in many Bayesian text books and also at:
  - http://halweb.uc3m.es/esp/Personal/personas/mwiper/docencia/English/PhD_Bayesian_Statistics/ch3_2009.pdf
  - https://en.wikipedia.org/wiki/Conjugate_prior
- Calculate various predictive posterior probabilities of quantities of interest. Note that this can be done sequentially if the data is very big.