Quiz 5

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1. Siddhartha Chib; Ivan Jeliazkov, Journal of the American Statistical Association; Mar 2001; 96, 453; ABI/INFORM Completepg. 270-280

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Siddhartha Chib and Ivan Jeliazkov

This article provides a framework for estimating the marginal likelihood
extends and completes the method presented in Chib (1995) by overcor
full conditional densities. The proposed method is developed in the co
algorithm, whose building blocks are used both for sampling and marg
effort and programming. Experiments involving the logit model for binary
data, Poisson regression model for clustered count data, and the multivaria
the performance and implementation of the method. These examples den

KEY WORDS: Bayes factor; Bayesian model comparison; Clustered
reversibility; Metropolis–Hastings algorithm; Multivaria

1. INTRODUCTION

Consider the problem of comparing a collection of models $\{\mathcal{M}_1, \ldots, \mathcal{M}_L\}$ that reflect competing hypotheses about the data $\mathbf{y} = (y_1, \ldots, y_n)$. Suppose that each model $\mathcal{M}_l$ is characterized by a model-specific parameter vector $\boldsymbol{\theta}_l \in S_l \subseteq \Re^{k_l}$ of dimension k_l and sampling density $f(\mathbf{y}|\mathcal{M}_l, \boldsymbol{\theta}_l)$. In this context, Bayesian model selection proceeds by pairwise comparison of the models in $\{\mathcal{M}_l\}$ through their posterior odds ratio, which for any two models $\mathcal{M}_i$ and $\mathcal{M}_j$ is written as

$$\frac{\Pr(\mathcal{M}_i|\mathbf{y})}{\Pr(\mathcal{M}_j|\mathbf{y})} = \frac{\Pr(\mathcal{M}_i)}{\Pr(\mathcal{M}_j)} \times \frac{m(\mathbf{y}|\mathcal{M}_i)}{m(\mathbf{y}|\mathcal{M}_j)} \qquad (1)$$

where

$$m(\mathbf{y}|\mathcal{M}_l) = \int f(\mathbf{y}|\mathcal{M}_l, \boldsymbol{\theta}_l)\pi_l(\boldsymbol{\theta}_l|\mathcal{M}_l)\, d\boldsymbol{\theta}_l \qquad (2)$$

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