

Exercise: Prior for the Bernoulli rate parameter in the spike and slab model

Consider the spike and slab prior. Suppose we put a separate prior on the sparsity rates for each dimension, $\pi_j \sim \text{Beta}(\alpha_1, \alpha_2)$. Derive an expression for $p(\gamma|\alpha)$ after integrating out the π_j 's. Discuss some advantages and disadvantages of this approach compared to assuming $\pi_j = p_1$ for fixed p_1 .