

ST740 Homework #3

Due: in class on March 10

1. Derive equation 3.16
2. It has been suggested that the maximum likelihood estimates of the CAR model can be approximated by

$$p(y_1, \dots, y_n) \approx K \prod_i p(y_i | y_j, j \in \delta_i)$$

for some normalizing constant K . Comment on the validity of this approximation in the context of Brook's Lemma.

3. A single conjugate prior may be inadequate to accurately reflect available prior knowledge. However, a finite mixture of conjugate priors may be sufficiently flexible while still allowing for implied posterior calculations. Show that a two-component mixture of conjugate priors leads to a mixture of conjugate posteriors and give the form of the conjugate posterior.
4. Problem 4.1
5. Problem 4.3