April 11, 2013

Bayesian inference

- 1. Simulate 3 sets of samples from $N(5, \sigma^2 = 1)$ with n = 100, 200, 500.
- 2. Find Bayes estimate for μ with prior distribution N(1,5), N(5,0.01), N(2,4) for each of the 3 datasets assuming $\sigma^2 = 1$ is known. Classify them as precise / less precise prior information. So you have 3 estimates for n = 100, 3 for n = 200 and 3 for n = 500.
- 3. Obtain the MLE as the fourth estimate for each of the sets of samples.
- 4. Compare the 4 estimates for each of the 3 sets of samples and explain your observation.
- 5. Repeat the above exercise if $\sigma^2 = 1$ is unknown and you obtain the Bayes estimate based on the plugged-in sample variance. Report any difference of results from 4.