Summary of Bayesian Estimates

- Model the distribution of the variable given the parameter.
- Pick a prior
- Posterior = Bayes factor X prior
- Bayes factor α likelihood (constant of proportionality usually not needed)
- Bayes estimator = E(posterior)

Choice of Prior

Cox and Hinkley's three possibilities:

1. A frequency distribution based on previous data
2. Based on rational belief about the parameter (e.g., positive, max, min).
3. A subjective expression of belief.

Also: Maximum entropy, etc. considerations

Further Types of Bayesian Analysis

- Use the posterior to get "credible intervals"
- Bayesian hypothesis testing: calculate posterior odds of competing hypotheses
- Bayesian decision theory: optimization (maximize utility X posterior) or minimax (minimize the maximum possible risk)

Pros and Cons

Pro:

- Allows use of prior or "collateral" knowledge
- Allows subjectivist interpretations
- Allows comparison of multiple hypotheses
- More likely than frequentist to force thought

Con:

- May require intensive computation
- Deciding priors requires skill