

## 6 Likelihood Inference

- Properties of estimators
  - Consistency
  - Asymptotic normality
- Maximum likelihood estimation
  - Fisher's information
  - Asymptotic distribution of mles
- Confidence intervals
  - Confidence intervals for the mean of a normal population
  - Using pivots to form confidence intervals
  - Forming approximate confidence intervals using the mle
  - Bootstrap confidence intervals

## 7 Bayesian approach to parametric inference

- Prior and posterior distributions
- Conjugate prior distributions
- Posterior mean, median, and mode
- Bayes intervals and Bayes HPD intervals

## 8 Testing Hypotheses

- A Bayesian approach to hypothesis testing
- The likelihood ratio and the Neyman-Pearson approach to testing
  - $H_0$ ,  $H_a$ , types of error, error probabilities, power, test statistic, rejection region

- Neyman-Pearson Lemma and most powerful tests
  - Uniformly most powerful tests
- Specification of level and  $P$ – values
- Duality of confidence intervals and hypothesis tests
- Generalized likelihood ratio tests
  - LR statistic and rejection region
  - Large sample distribution of the LR statistic
  - Wald and score tests
  - Forming confidence intervals from LR, Wald, and score tests