Previously on MA40189:

- exchangeable sequences with exponential family likelihood have sufficient statistics:

$$t_n \;=\; t_n(X_1, \ldots, X_n) \;=\; \left[n, \sum_{i=1}^{n} u_1(X_i), \ldots, \sum_{i=1}^{n} u_k(X_i)\right]$$

- conjugacy of exponential family distributions:
  - regard $f(x \mid \theta)$ as a function of θ,

$$f(x \mid \theta) \;=\; \exp\left\{\sum_{j=1}^{k} u_j(x)\phi_j(\theta) + 1g(\theta) + h(x)\right\}$$

  - posterior is

$$f(\theta \mid x) \;\propto\; \exp\left\{\sum_{j=1}^{k} (a_j + u_j(x))\phi_j(\theta) + (d+1)g(\theta)\right\}$$

Today on MA40189:

- usefulness of conjugate priors
  - ease the inferential process, posterior simple to obtain
  - ease burden on prior specification
- noninformative prior distributions: let the data speak for themselves
  - represent ignorance by using improper uniform distribution; posterior is then the scaled likelihood
  - alternative is the Jeffreys prior for univariate θ, $f(\theta) \propto \sqrt{I(\theta)}$ where $I(\theta)$ is the Fisher information