Office hours will be posted on the course web page no later than Fri 24 Jan, and will probably occur on HW draft 1 of take-home test 1.

HW is on the web page now; final draft no later than Fri 24 Jan; nominal due date Th 30 Jan (comp. dead line date probably 1 week later).

\[ p(\Theta | B) \leftarrow \text{prior distribution} \]

\[ U(0, 1) \leftarrow \text{uniform} \]

Conjecture, not a theorem.
unknown \( \theta = (\theta_1, \ldots, \theta_k) \) 

\[ p(B|AB) = \frac{p(B|B)p(A|BB)}{p(A|B)} \]

data \( D = (y_1, \ldots, y_n) = y \), each \( y \): real

\[ p(\theta|yB) = \frac{p(\theta|B)p(y|\theta B)}{p(y|B)} \]

Posterior dist. for \( \theta \)

dimensions

Probabilty density function

for \( \theta \)

Prior dist. for \( \theta \)

conjugate normal distribution

Sampling dist.

Bayes's theorem

for continuous

\( \theta \)

\( y \)

\( p(\theta|yB) \) is a fn of \( \theta \) for fixed \( y \)

once \( y \) observed

\( \theta \) still unknown.
before data arrives, \( p(y | \theta, B) \) is a \( f(\theta) \) of \( y \) for fixed \( \theta \);

after data arrives, logic of Bayes' Theorem forces us to think of \( p(y | \theta, B) \) as a \( f(y) \) of \( y \) for fixed \( \theta \).

\[
\ell_c(\theta | y, B) = c \cdot p(y | \theta, B)
\]

likelihood function

Fisher (1922) discovered

Leplae (1785)

11.03
\[ \text{posterior} = \left( \frac{\text{likelihood}}{\text{constant}} \right) \cdot \text{prior} \cdot \text{like} \]

\[ p(\theta | y | B) \propto c \cdot p(\theta | B) L(\theta | y | B) \]

\[ p(\theta | y | B) \propto c \cdot p(\theta | B) \]

Underline:

\[ p(\theta | y | B) \propto c \cdot p(\theta | B) \]

In general:

This is wrong because it omits the prior information.

\[ \frac{1}{2 n} \]
Venn, Kolmogorov

Frequentist
relative frequency
repeated sampling

approach to
merging
of prob.

de-pends on existence of a
related to heterogeneous sample space
repeatable collective, i.e.,

you can extend the thing
of interest to you in a
hypothetical series of
repetitions of something
ideal roulette wheel

<table>
<thead>
<tr>
<th>Rep. #</th>
<th>Outcome</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>n</td>
</tr>
<tr>
<td>2</td>
<td>n</td>
</tr>
<tr>
<td>3</td>
<td>y</td>
</tr>
<tr>
<td>4</td>
<td>n</td>
</tr>
</tbody>
</table>

- 38 slots (F0)
- 18 red
- 18 black

\[ P = \frac{18}{38} \text{ (green man next spin, 18)} \]