Bayesian Regression

When to use Bayes:

- To generate probabilities along with a quantification of uncertainty

Helpful examples

- When selecting different fruits from different boxes, the observation of which fruit can be used to update our belief about which box a fruit was selected from.

Implementation Considerations:

- Bayes theorem gains new significance: we define the probability of our estimators (w) as p(w|data), which is equivalent to the probabiltiy of the data given our estimators, times the probability of the estimators over the probability of the data.
- The probability of the data is the normalization constant which ensures a probability density which integrates to one.
- To find the MAP estimator of w, find the minimum of eq 1.67 (pg 31)

Resources:

- Bayesian_regression.pdf
- Sections 1.2.3-1.2.6 of bishop_pattern-recognition-and-machine-learning.pdf (pages 21 - 32)
- Chapter 11 of All of Statistics.pdf