Lecture 6.1: Continuous Distributions

2013/10/07

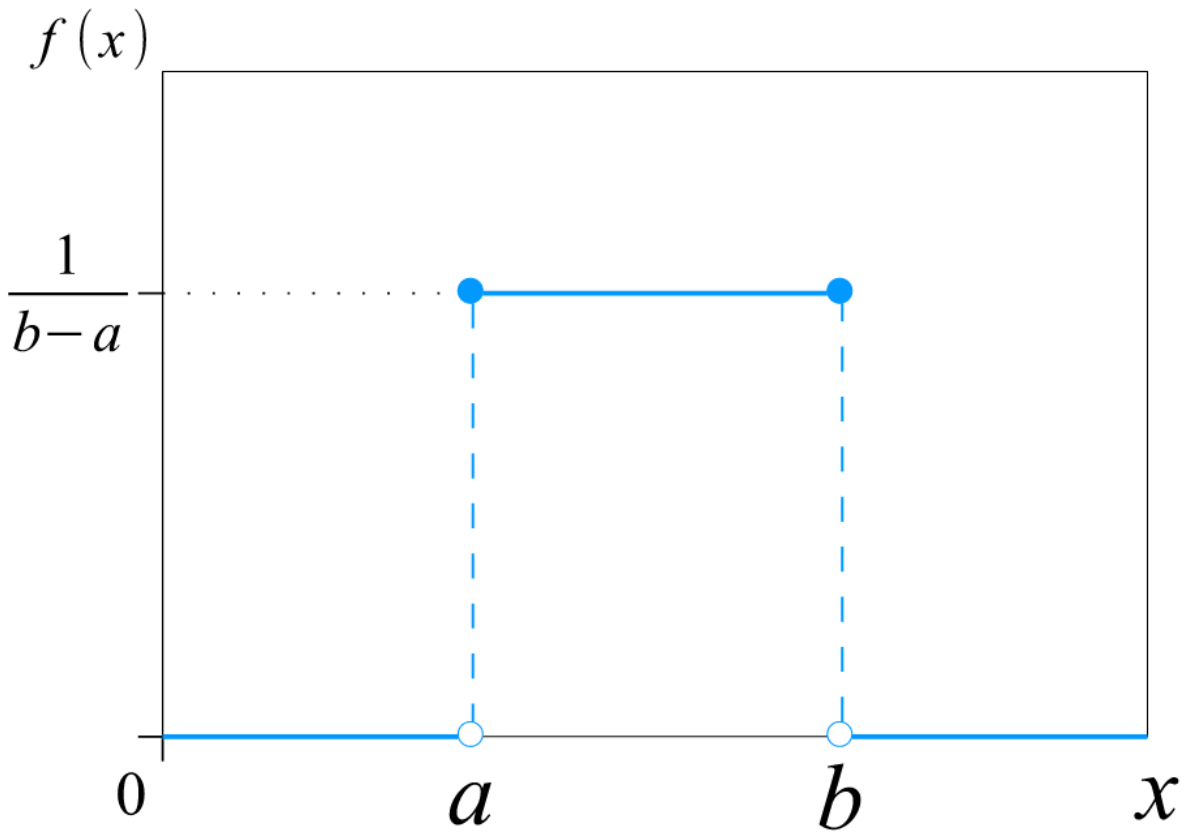
Goals for Today

Introduce the

- Uniform distribution
- Gamma distribution
- Exponential Distribution
- Beta Distribution

Uniform Distribution

Uniform Distribution



Uniform Distribution

Gamma Distribution

Gamma Distribution

Gamma Distribution

Gamma Distribution

Exponential Distribution

Exponential Distribution

Memoryless Property of the Exponential Distribution

If a random variable T is exponentially distributed, then

$$\mathbb{P}(T > s + t \mid T > s) = \mathbb{P}(T > t) \text{ for all } s, t \geq 0.$$

Let T be the time one needs to wait until a bus arrives. The memoryless property states if we've waited s minutes, then the probability that we need to wait another t minutes for the bus is the same as the initial probability that we need to wait more than t minutes for the bus.

Beta Distribution

Beta Distribution

Beta Distribution in Bayesian Statistics

The Beta(α, β) distribution is often used to model the prior distribution of a probability p. So say p is the probability of flipping a coin and getting heads. We can model different levels of prior belief that the coin is fair:

Next Time

- Normal Distribution
- t distribution