Statistics 300:
Elementary Statistics

Section 6-4

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Sampling Distributions

- **Given: X has mean = m and standard deviation = s**
- **For a specified sample size "n"**
- **How many samples are possible?**
- **What is the distribution for means of all of these samples?**
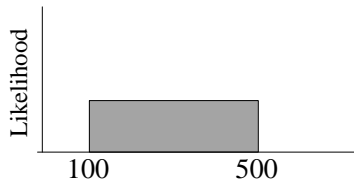
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Sampling Distributions
- **Consider 400,000 acres of grazing land for cattle**
- **Select 80 acres at random**
- **How many samples are possible?**
- **Measure the biomass for each**
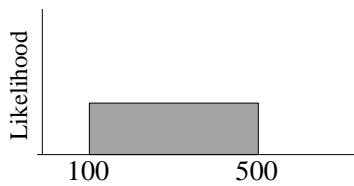- **What is the distribution of the st.dev. of all of these samples?**

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The Uniform Distribution

X ~ U[a,b]

Likelihood

The total area = 1

a   b

The Uniform Distribution

X ~ U[100,500]

Likelihood
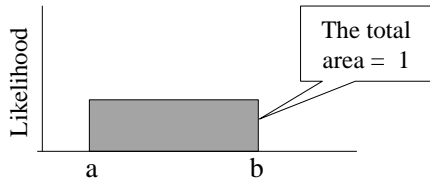
100   500

The Uniform Distribution

X ~ U[100,500]

P(2 values are both < 140)

Likelihood

100   500

If   X ~ U[a,b] then

$$P(c < x < d) = \frac{d - c}{b - a}$$

Likelihood

a   c   d   b
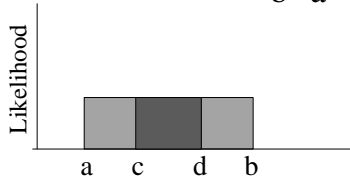
If X ~ U[100,500] then

- $P(x_1 < 140 \text{ and } x_2 < 140) =$
- $P(x_1 < 140)\, P(x_1 < 140) =$
- $(0.1)(0.1) = 0.01$

100 140   500