

Sampling Summary

SMALL Samples

STATISTICS

Distribution

$$\sum_{i=1}^n X_i$$

$$\bar{X}$$

$$\max(X_i)$$

$$\min(X_i)$$

$X \sim N(\mu, \sigma^2)$
 σ^2 noto

$$N(n\mu, n\sigma^2)$$

$$N(\mu, \sigma^2/n)$$

$X \sim \text{Bernoulli}(\pi)$

$$\text{Binom}(n, \pi)$$

$$\approx \text{Binom}(n, \pi)$$

$$\text{Bernoulli} \\ (1 - (1 - \pi)^n)$$

$$\text{Bernoulli}(\pi^n)$$

$X \sim \text{Uniform}(0, \theta)$

$$\theta \times \text{Beta}(n, 1)$$

$$f_{X(n)} = \frac{n}{\theta} \left(\frac{x}{\theta}\right)^{n-1} I_{[0, \theta]}(x)$$

$$\theta \times \text{Beta}(1, n)$$

$$f_{X(1)} \\ = \frac{n}{\theta} \left(1 - \frac{x}{\theta}\right)^{n-1} I_{[0, \theta]}(x)$$

$X \sim \text{Exponential}(\lambda)$

$$\Gamma(n, \lambda)$$

$$\Gamma(n, \lambda/n)$$

$$\text{Exponential}(\lambda/n).$$

LARGE Samples

STATISTICS

Distribution

$$\sum_{i=1}^n X_i$$

$$\bar{X}$$

$\max(X_i)$

$\min(X_i)$

$X \sim N(\mu, \sigma^2)$
 σ^2 noto

$N(n\mu, n\sigma^2)$

$N(\mu, \sigma^2/n)$

$X \sim \text{Bernoulli}(\pi)$

$N(n\pi, n\pi(1-\pi))$

$N(\pi, \pi(1-\pi)/n)$

$X \sim \text{Uniform}(0, \theta)$

$N(n\theta/2, n\theta^2/12)$

$N(\theta/2, \theta^2/(12n))$

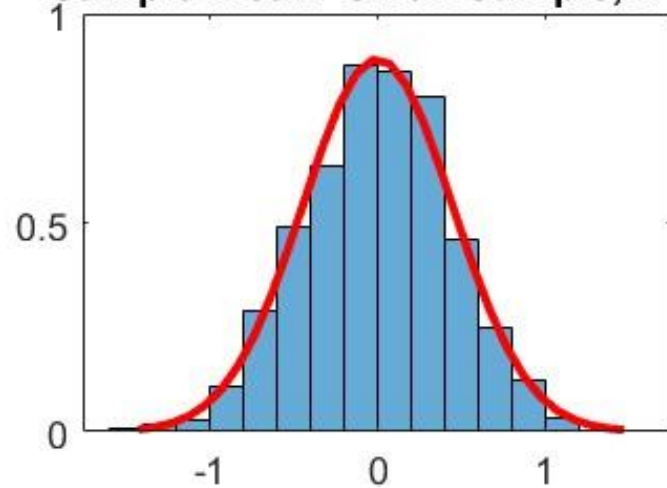
$X \sim \text{Exponential}(\lambda)$

$N(n\lambda, n\lambda^2)$

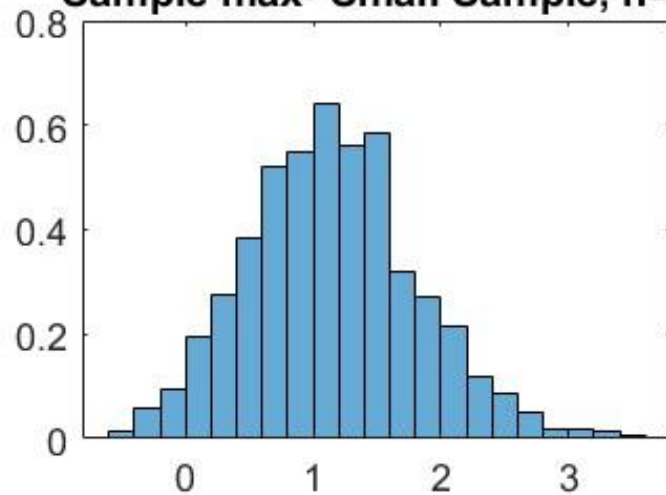
$N(\lambda, \lambda^2/n)$

$$X \sim N(0,1)$$

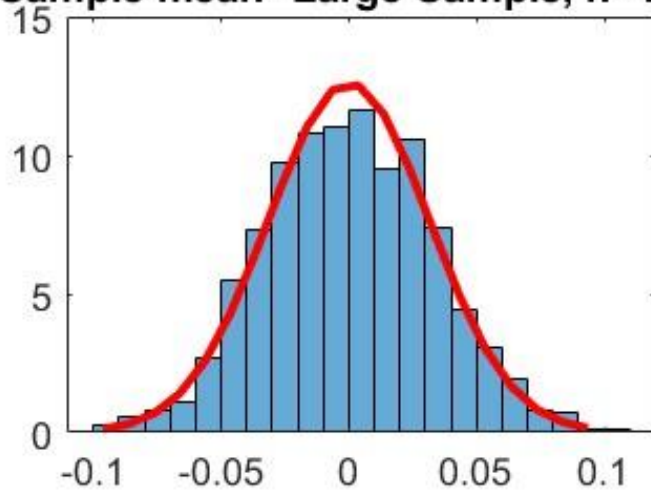
Sample mean- Small Sample, n=5



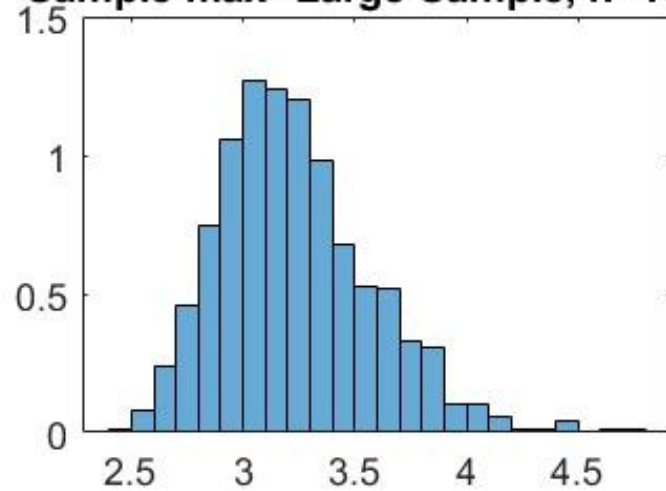
Sample max- Small Sample, n=5



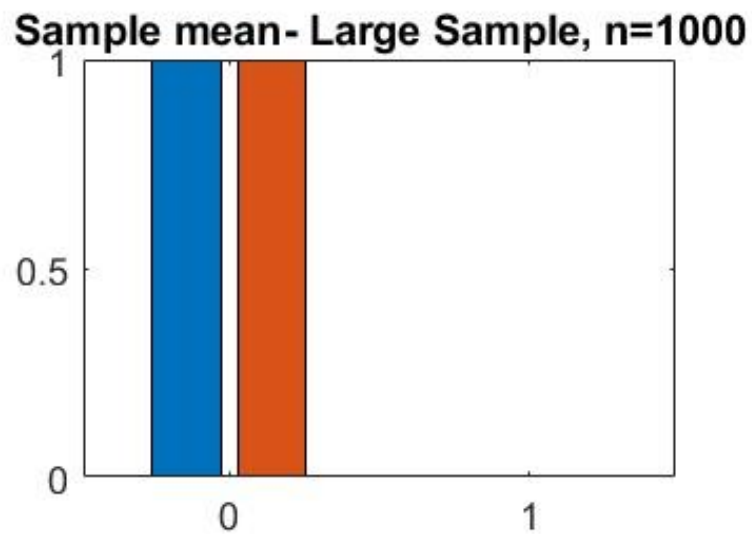
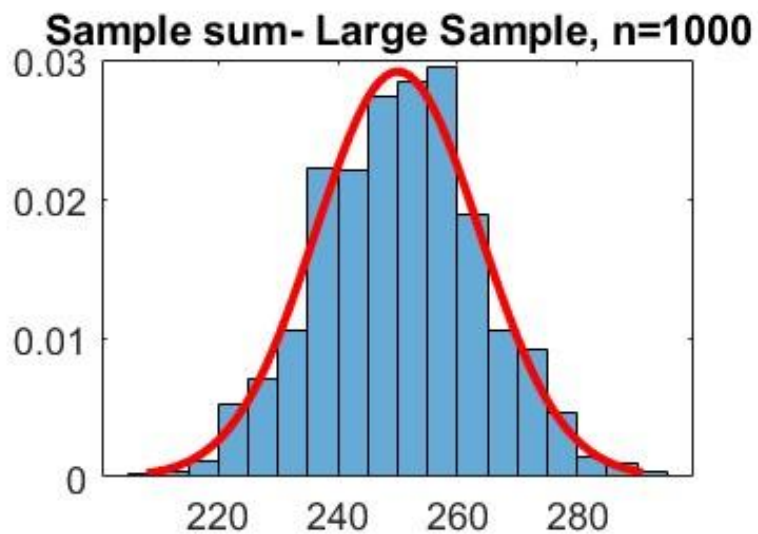
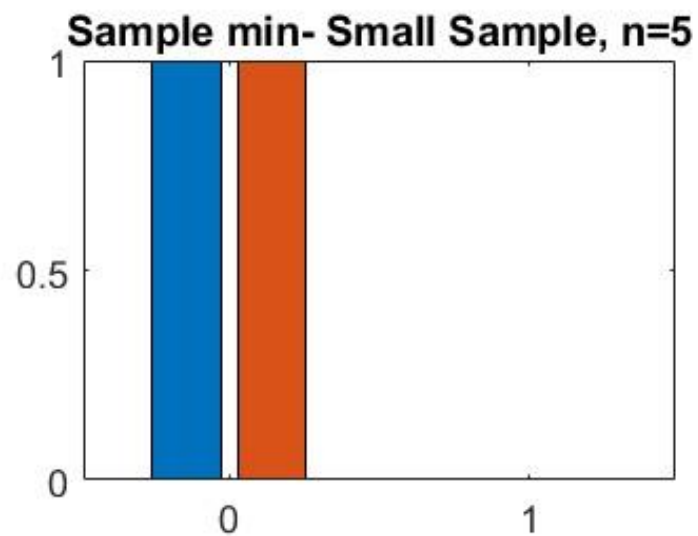
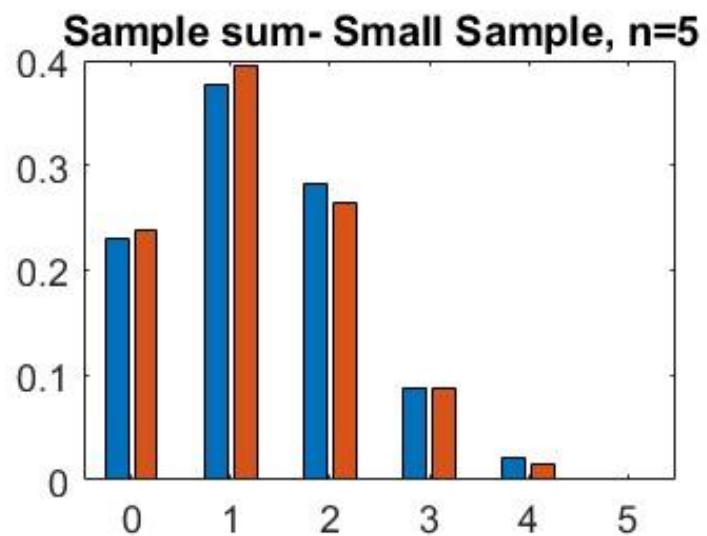
Sample mean- Large Sample, n=1000



Sample max- Large Sample, n=1000

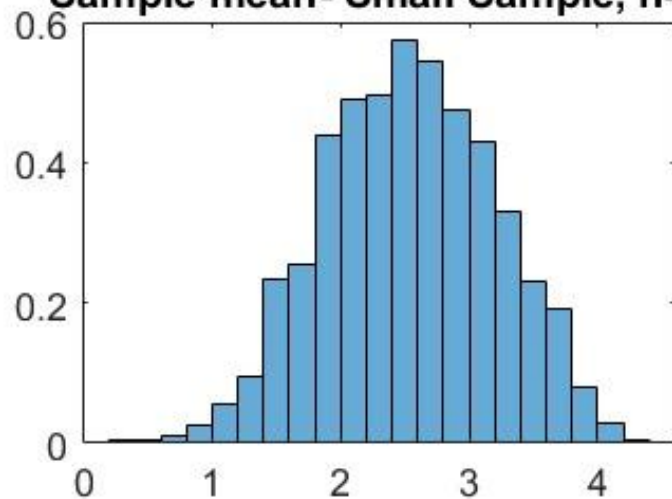


$$X \sim \text{Bernoulli}(0.25)$$

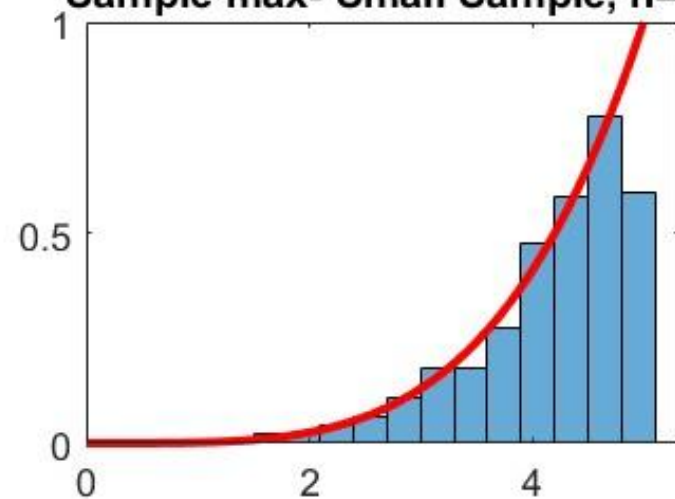


$$X \sim \text{Uniform}(0,5)$$

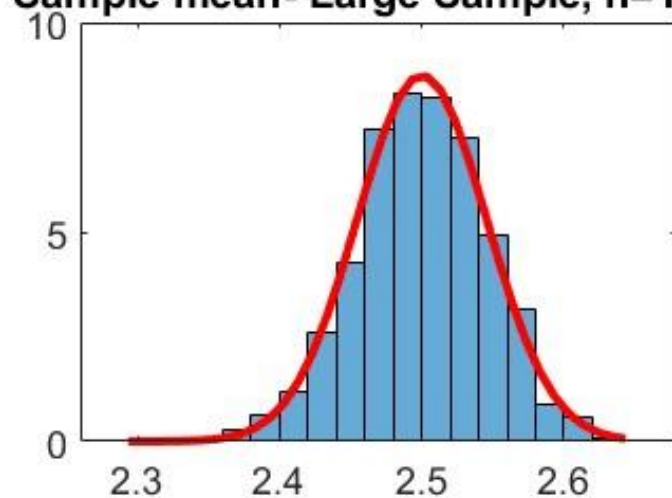
Sample mean- Small Sample, n=5



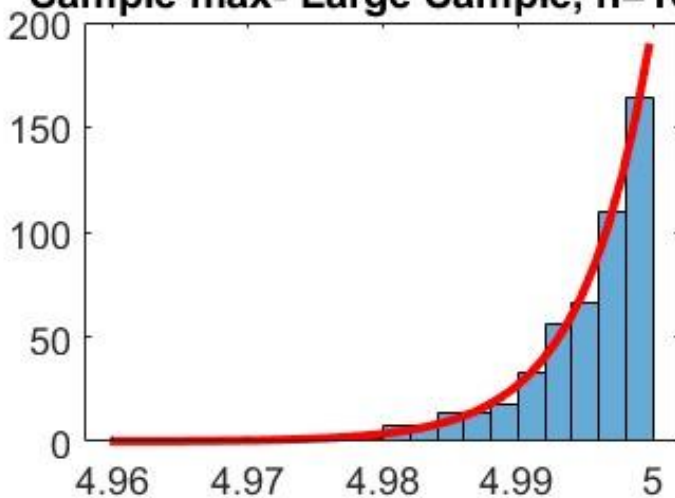
Sample max- Small Sample, n=5



Sample mean- Large Sample, n=1000



Sample max- Large Sample, n=1000



$$X \sim \text{Exponential}(10)$$

