STA 1013 : Statistics through Examples

Lecture 19: Review for LSQA

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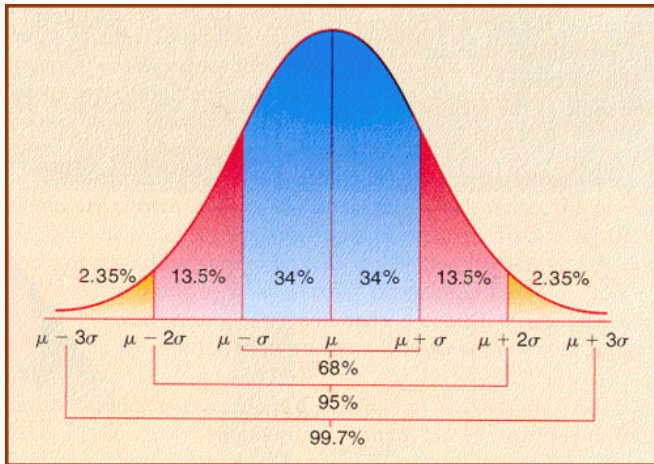
Topics :

- Normal distribution
- Central Limit Theorem

Section 15 : MWF (10:10 $\sim$ 11:00)

- Test Date : Oct 21 (Mon) HCB 217

Section 05 : MWF (12:20 $\sim$ 1:10)

- Test Date : Oct 18 (Fri) OSB 108

Unusual values : values that are more than 2 standard deviations away from the μ

- Unusual low : values **Less than** $\mu - 2\sigma$
- Unusual high : values **Greater than** $\mu + 2\sigma$

Normal Probability

- **normalcdf** : Find the probability from the given value
- **invNorm** : Find the value from the given probability

Central Limit Theorem

Central Limit Theorem (CLT)

Suppose the population distribution (**Not necessarily a normal distribution**) has population mean μ, and population standard deviation σ, then the distribution of sample means (Sampling distribution of $\bar{X}$) converges to $N\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$

$$X \sim \textbf{Any distribution } (\mu, \sigma)$$

$$\bar{X} \sim N\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$$

- The distribution of sample means will be approximately a normal distribution for **large sample sizes ($n \geqslant 30$)**.
- If the population distribution is normal distribution, a sample size doesn't matter.