**X** = {x1, x2, x3, x4, x5, x6, x7, x8,… xn}

$\hat{p}=\frac{n\_{s}}{n}$ where *ns* represents a subgroup of *n,* likewise, $π=\frac{N\_{s}}{N}$

$\overbar{x}=\frac{1}{n}\sum\_{i=1}^{n}x\_{i}= \frac{x\_{1}+x\_{2}+…+x\_{n}}{n}$ µ $=\frac{1}{N}\sum\_{i=1}^{N}x\_{i}= \frac{x\_{1}+x\_{2}+…+x\_{N}}{N}$

$s= \sqrt{\frac{\sum\_{i=1}^{n}\left(x\_{i}-\overbar{x}\right)^{2}}{n-1}}= \sqrt{\frac{\left(x\_{1}-\overbar{x}\right)^{2}+\left(x\_{2}-\overbar{x}\right)^{2}+…+\left(x\_{n}-\overbar{x}\right)^{2}}{n-1}}$

$$σ= \sqrt{\frac{\sum\_{i=1}^{n}\left(x\_{i}-µ\right)^{2}}{N}} = \sqrt{\frac{\left(x\_{1}-µ\right)^{2}+\left(x\_{2}-µ\right)^{2}+…+\left(x\_{N}-µ\right)^{2}}{N}}$$

$z\_{i}=\frac{x\_{i}-µ}{σ}$ $t\_{df}=\frac{\overbar{x}-µ}{^{s}/\_{\sqrt{n}}}$ $z= \frac{\hat{p}-π}{\sqrt{\frac{π(1-π)}{n}}}$ $z=\frac{\overbar{x}-µ}{^{σ}/\_{\sqrt{n}}} z\_{i\_{x}}=\frac{x\_{i}-\overbar{x}}{s}$

$$r=\frac{1}{n-1}\sum\_{i=1}^{n}\left(\frac{x\_{i}-\overbar{x}}{s\_{x}}\right)\left(\frac{y\_{i}-\overbar{y}}{s\_{y}}\right)=\frac{1}{n-1}\sum\_{i=1}^{n}z\_{i\_{x}}z\_{i\_{y}}$$

C.I.: (mean) ± (confidence statistic) x (SE)

 $\overbar{x}$ $t\_{\frac{α}{2},df}$ $^{s}/\_{\sqrt{n}}$

$ \overbar{x}$ $z\_{\frac{α}{2}}$ $^{σ}/\_{\sqrt{n}}$ (rare situation but possible)

 $\hat{p}$ $z\_{\frac{α}{2}}$ $ \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Sigma Operator Examples:

$$\sum\_{i=1}^{n}z\_{i}= z\_{1}+z\_{2}+z\_{3}+…+z\_{n}$$

$$\sum\_{k=1}^{6}kz\_{k}= z\_{1}+2z\_{2}+3z\_{3}+4z\_{4}-5z\_{5}+6z\_{6}$$