

Experimental Runs

Confidence Interval (CLT)

Random:

$$\bar{x}_n = 17.67 \text{ mins} \quad n = 500$$

$$\bar{s}_n = 0.606 \quad z_{\alpha/2} = 2.576$$

$$\begin{aligned} \text{Confidence Interval: } & \left(\bar{x}_n - z_{\alpha/2} \frac{\bar{s}_n}{\sqrt{n}}, \bar{x}_n + z_{\alpha/2} \frac{\bar{s}_n}{\sqrt{n}} \right) \\ & = \left(17.67 - 2.576 \cdot \frac{0.606}{\sqrt{500}}, 17.67 + 2.576 \cdot \frac{0.606}{\sqrt{500}} \right) \end{aligned}$$

$$\text{Confidence Interval (mins): } [17.60, 17.74]$$

Back-To-Front:

$$\bar{x}_n = 20.58 \text{ mins} \quad n = 500$$

$$\bar{s}_n = 0.819 \quad z_{\alpha/2} = 2.576$$

$$\begin{aligned} \text{Confidence Interval: } & \left(\bar{x}_n - z_{\alpha/2} \frac{\bar{s}_n}{\sqrt{n}}, \bar{x}_n + z_{\alpha/2} \frac{\bar{s}_n}{\sqrt{n}} \right) \\ & = \left(20.58 - 2.576 \cdot \frac{0.819}{\sqrt{500}}, 20.58 + 2.576 \cdot \frac{0.819}{\sqrt{500}} \right) \end{aligned}$$

$$\text{Confidence Interval (mins): } [20.48, 20.67]$$

Outside-In:

$$\bar{x}_n = 16.81 \text{ mins} \quad n = 500$$

$$\bar{s}_n = 0.548 \quad z_{\alpha/2} = 2.576$$

$$\begin{aligned} \text{Confidence Interval: } & \left(\bar{x}_n - z_{\alpha/2} \frac{\bar{s}_n}{\sqrt{n}}, \bar{x}_n + z_{\alpha/2} \frac{\bar{s}_n}{\sqrt{n}} \right) \\ & = \left(16.81 - 2.576 \cdot \frac{0.548}{\sqrt{500}}, 16.81 + 2.576 \cdot \frac{0.548}{\sqrt{500}} \right) \end{aligned}$$

$$\text{Confidence Interval (mins): } [16.75, 16.81]$$

After 500 Experimental runs:

Boarding strategy	Average boarding time (mins)	Variance in time (mins)	Confidence Interval (mins)
Random	17.67	0.606	[17.60, 17.74]
Back-To-Front	20.58	0.819	[20.48, 20.67]
Outside-In	16.81	0.548	[16.75, 16.81]