

Calculations

$$z_{\beta} = \Phi^{-1}(p)$$

$$\text{Estimated Test Average: } \mu_1 = \mu_0(1 + m)$$

No Bonferroni:

$$z_{\alpha} = \Phi^{-1}\left(1 - \frac{1-c}{T}\right)$$

$$\text{Sample Size Required Per Recipe: } n = \frac{(z_{\alpha} + z_{\beta})^2 2\sigma^2}{(\mu_1 - \mu_0)^2}$$

$$\text{Total Sample Size Required: } N_{total} = n(K + 1)$$

$$\text{Estimated Duration: } D = \left\lceil \frac{N_{total}}{D} \right\rceil$$

With Bonferroni:

$$z_{\alpha, Bon} = \Phi^{-1}\left(1 - \frac{1-c}{TK}\right)$$

$$\text{Sample Size Required Per Recipe: } n_{bon} = \frac{(z_{\alpha, Bon} + z_{\beta})^2 2\sigma^2}{(\mu_1 - \mu_0)^2}$$

$$\text{Total Sample Size Required: } N_{total, Bon} = n_{bon}(K + 1)$$

$$\text{Estimated Duration: } D_{Bon} = \left\lceil \frac{N_{total, Bon}}{D} \right\rceil$$

Legend

c = Confidence $\in (0, 1)$ This is $1 - \alpha$

p = Power $\in (0, 1)$ This is $1 - \beta$

m = MDE $\in (0, 1)$: minimum detectable effect as a relative lift

T = Tails $\in \{1, 2\}$: One or Two-Tailed test

K = Number of Test Variants $\in \mathbb{N}$ Number of test variants not including control

μ_0 = Mean Value $\in \mathbb{R}$

σ = Standard Deviation $\in \mathbb{R}$

D = Daily Traffic $\in \mathbb{R}^+$

$\Phi^{-1}(p)$ = Inverse of the normal distribution function. This Function takes a probability and returns the corresponding z.

Credits: Calculator by [Geoffrey Wortham](#); Documentation by [Merritt Aho](#)

Github Repo: <https://github.com/shongzahToo/continuous-sample-size-react>