Calculations

zBeta: $z_{\beta} = \phi^{-1}(p)$

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

No Bonferroni:

zAlpha: $z_{\alpha} = \phi^{-1}(1 - \frac{1-c}{T})$

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

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

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

With Bonferroni:

zAlpha: $z_{\alpha,Bon} = \phi^{-1}(1 - \frac{1-c}{TK})$

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

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

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

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-calculator