Assumptions when using statistics to infer population parameters.

Estimation of mean

number of samples	H_0	Assumptions	Test statistics
1 sample	H_0: $\mu = \mu_0$	σ^2 known	Z
1 sample	H_0: $\mu = \mu_0$	σ^2 unknown and population is normal, $n < 30$	T
2 samples	H_0: $\mu_1 - \mu_2 = d_0$	σ_1^2 & σ_2^2 known	Z
2 samples	H_0: $\mu_1 - \mu_2 = d_0$	$\sigma_1^2 = \sigma_2^2$ unknown and populations are independent and normal	pooled variance T
2 samples	H_0: $\mu_1 - \mu_2 = d_0$	$\sigma_1^2 \neq \sigma_2^2$ unknown and populations are independent and normal	separate variance T
2 samples	H_0: $\mu_1 - \mu_2 = u_d = d_0$	Populations are dependent and the difference is normal	Paired T
k samples	H_0: $\mu_1 = \mu_2 = \cdots = \mu_k$	$\sigma_1^2 = \sigma_2^2 = \cdots = \sigma_k^2$ unknown and populations are normal	F

Estimation of variance

number of samples	H_0	Assumptions	Test statistics
1 sample	H_0: $\sigma^2 = \sigma_0^2$	population is normal	χ^2
2 samples	H_0: $\sigma_1^2 = \sigma_2^2$	populations are independent and normal	F

Estimation of proportion

number of samples	H_0	Assumptions	Test statistics
1 sample	H_0: $p = p_0$	$\min\left(n\hat{p}, n\left(1-\hat{p}\right)\right) \geq 5$	Z
2 samples	H_0: $p_1 - p_2 = 0$	$\min\left(n\hat{p}_i, n\left(1-\hat{p}_i\right)\right) \geq 5$, $i = 1,2$	Z