

Homogeneity tests for <b>independent</b> samples			
Data		2 Samples	> 2 Samples
Continuous & Meets Normality Assumption	Mean	$\mathbb{H}_0 : \mu_1 = \mu_2$ $\mathbb{H}_1 : \mu_1 \neq \mu_2$ 2 Sample t-test if $\sigma_1 = \sigma_2$ Welch's t-test if $\sigma_1 \neq \sigma_2$	$\mathbb{H}_0 : \mu_1 = \mu_2 = \dots = \mu_K$ $\mathbb{H}_1 : \exists i \neq j, \mu_i \neq \mu_j$ ANOVA if $\sigma_1 = \dots = \sigma_K$
	Standard Deviation	$\mathbb{H}_0 : \sigma_1 = \sigma_2$ $\mathbb{H}_1 : \sigma_1 \neq \sigma_2$ Fisher test	$\mathbb{H}_0 : \sigma_1 = \sigma_2 = \dots = \sigma_K$ $\mathbb{H}_1 : \exists i \neq j, \sigma_i \neq \sigma_j$ Bartlett's test
Continuous & Non normal	Median	$\mathbb{H}_0 : \eta_1 = \eta_2$ $\mathbb{H}_1 : \eta_1 \neq \eta_2$ Mann Whitney test	$\mathbb{H}_0 : \eta_1 = \eta_2 = \dots = \eta_K$ $\mathbb{H}_1 : \exists i \neq j, \eta_i \neq \eta_j$ Kruskal-Wallis test
Discrete	Proportion	$\mathbb{H}_0 : \Pi_1 = \Pi_2$ $\mathbb{H}_1 : \Pi_1 \neq \Pi_2$ Asymptotic Z-test & Fisher exact test in the Bernoulli model	$\mathbb{H}_0 : \Pi_1 = \Pi_2 = \dots = \Pi_K$ $\mathbb{H}_1 : \exists i \neq j, \Pi_i \neq \Pi_j$ $\chi^2$ test

Homogeneity tests for <b>dependent</b> samples (matched/paired data)		
Data	2 Samples	> 2 Samples
Continuous	Wilcoxon signed rank test	Cochran Q-test
Discrete	Mc Nemar's test	Friedman test

Goodness of Fit for a Single Distribution			
Parametric model		Non Parametric model	
<b>General model</b> Nonasymptotic test Student-Wald test	<b>Gaussian model</b> Tests for $\mu$ : • $\sigma^2$ known: Z-test • $\sigma^2$ unknown: t-test Test for $\sigma^2$ : F-test	<b>Discrete model</b> $\chi^2$ test	<b>Continuous model</b> Kolmogorov Smirnov test (asymptotic or non asymptotic) Anderson Darling test

#### Goodness-of-fit for a family of distributions

- Discrete model:  $\chi^2$  test
- Continuous model: Lilliefors test, Shapiro-Wilk test, d'Agostino's K-squared test

#### Independence tests

- Discrete model:  $\chi^2$  test
- General model: (Kendal)  $\tau$  test
- Regression-based independence tests:
  - Linear: t- and F-tests
  - Logistic: likelihood ratio test