Formulario per il corso di Statisca CLEAM, AA 20/21

Media aritmetica	Varianza	Percentile
$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$	$\hat{\sigma}^2 = \dfrac{1}{n}\sum_{i=1}^{n} x_i^2 - \bar{x}^2$	$x_p = x_{\text{inf};j_p} + \dfrac{p - F_{j_p-1}}{f_{j_p}} \cdot \left(x_{\text{sup};j_p} - x_{\text{inf};j_p}\right)$

Binomiale	Poisson
$f(x) = \binom{n}{x}\pi^x(1-\pi)^{n-x}$	$f(x) = \dfrac{\lambda^x}{x!}e^{-\lambda}$

Test Z, 1 Campione	Test t, 1 Campione	Proporzione, 1 Campione
$z_{\text{obs}} = \dfrac{\hat{\mu} - \mu_0}{\sigma/\sqrt{n}}$	$t_{\text{obs}} = \dfrac{\hat{\mu} - \mu_0}{S/\sqrt{n}}$ $S^2 = \dfrac{n}{n-1}\hat{\sigma}^2$	$z_{\text{obs}} = \dfrac{\hat{\pi} - \pi_0}{\sqrt{\frac{\pi_0(1-\pi_0)}{n}}}$

Test t, 2 Campioni Omogeneità	Test t, 2 Campioni Eterogeneità	Proporzione, 2 Campioni
$t_{\text{obs}} = \dfrac{\hat{\mu}_A - \hat{\mu}_B}{\sqrt{\frac{S_p^2}{n_A} + \frac{S_p^2}{n_B}}}$ $S_p^2 = \dfrac{n_A\hat{\sigma}_A^2 + n_B\hat{\sigma}_B^2}{n_A + n_B - 2}$	$t_{\text{obs}} = \dfrac{\hat{\mu}_A - \hat{\mu}_B}{\sqrt{\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}}}$	$z_{\text{obs}} = \dfrac{\hat{\pi}_A - \hat{\pi}_B}{\sqrt{\frac{\hat{\pi}_C(1-\hat{\pi}_C)}{n_A} + \frac{\hat{\pi}_C(1-\hat{\pi}_C)}{n_B}}}$ $\hat{\pi}_C = \dfrac{\#\{\text{successi A}\} + \#\{\text{successi B}\}}{n_A + n_B}$ $= \dfrac{n_A\hat{\pi}_A + n_B\hat{\pi}_B}{n_A + n_B}$

Regressione		
$\text{cov}(x,y) = \dfrac{1}{n}\sum_{i=1}^{n} x_i\ y_i - \bar{x}\bar{y}$ $r = \dfrac{\text{cov}(x,y)}{\hat{\sigma}_X\hat{\sigma}_Y}$	$\hat{\beta}_1 = \dfrac{\text{cov}(x,y)}{\hat{\sigma}_X^2}$ $\hat{\beta}_0 = \bar{y} - \hat{\beta}_1\bar{x}$	$\hat{\sigma}_\varepsilon^2 = \hat{\sigma}_Y^2(1-r^2)$ $S_\varepsilon^2 = \dfrac{n}{n-2}\hat{\sigma}_\varepsilon^2$
$V(\hat{\beta}_1) = \dfrac{\sigma_\varepsilon^2}{n\hat{\sigma}_X^2}$	$V(\hat{\beta}_0) = \sigma_\varepsilon^2\left(\dfrac{1}{n} + \dfrac{\bar{x}^2}{n\hat{\sigma}_X^2}\right)$	$t_{j,\text{obs}} = \dfrac{\hat{\beta}_j - \beta_{j,H_0}}{\widehat{SE(\hat{\beta}_j)}}, \quad j = 0,1$

Chi-quadro χ^2
$\chi^2_{\text{obs}} = \sum_{i=1}^{I}\sum_{j=1}^{J} \dfrac{\left(n_{ij} - n_{ij}^*\right)^2}{n_{ij}^*}$