Hypothesis testing - distribution

test	hypothesis		test statistic	critical region W_α	note
	H - null	A - alternative			
test of skewness	$\alpha_3 = 0$	$\alpha_3 \neq 0$	$u_3 = \frac{a_3}{\sqrt{D(a_3)}}$	$\lvert u_3 \rvert \geq u_{1-\alpha/2}$	$D(a_3) = \frac{6(n-2)}{(n+1)(n+3)}$
test of kurtosis	$\alpha_4 = 0$	$\alpha_4 \neq 0$	$u_4 = \frac{a_4 + \frac{6}{n+1}}{\sqrt{D(a_4)}}$	$\lvert u_4 \rvert \geq u_{1-\alpha/2}$	$D(a_4) = \frac{24n(n-2)(n-3)}{(n+1)^2(n+3)(n+5)}$
Compound test of skewness and kurtosis	X has a normal distribution	X has not a normal distribution	$C = u_3^2 + u_4^2$	$C \geq \chi^2_{1-\alpha}(2)$	
χ^2-test goodness of fit	X has an assumed distribution $n_j = n\pi_j$	X has not an assumed distribution $n_j \neq n\pi_j$	$\chi^2 = \sum_{j=1}^{k} \frac{(n_j - n\pi_j)^2}{n\pi_j} = \sum_{j=1}^{k} \frac{n_j^2}{n\pi_j} - n$	$\chi^2 \geq \chi^2_{1-\alpha}(\nu)$	$\nu = k - c - 1$ for $\forall j : n\pi_j > 5$ $\pi_j = P(x_{j-1} \leq X < x_j)$ or $\pi_j = P(X = x_j)$