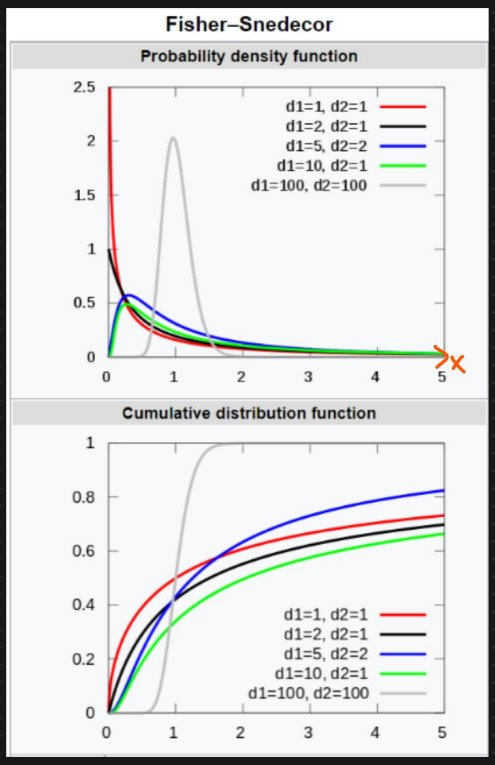
F distribution

In probability theory and statistics, the F-distribution or F-ratio, also known as Snedecor's F distribution or the Fisher–Snedecor distribution (after Ronald Fisher and George W. Snedecor) is a continuous probability distribution that arises frequently as the null distribution of a test statistic, most notably in the analysis of variance (ANOVA) and other F-tests.



Parameters : $d_1, d_2 > 0$ degree of freedom

Support $x \in (0, +\infty)$

F table

$\alpha = 0.05$ d_1 d_2

pdf =

$$f(x; d_1, d_2) = \frac{\sqrt{\frac{(d_1 x)^{d_1}\, d_2^{d_2}}{(d_1 x + d_2)^{d_1 + d_2}}}}{x\,\mathrm{B}\left(\frac{d_1}{2}, \frac{d_2}{2}\right)}$$

Beta function

$$\mathrm{B}(m,n) = \frac{(m-1)!\,(n-1)!}{(m+n-1)!} = \frac{m+n}{mn} \Big/ \binom{m+n}{m}.$$

The F distribution with d_1 and d_2 degree of freedom is the distribution of

$$X = \frac{S_1/d_1}{S_2/d_2}$$

S_1 = Independent random variables { Chi square distribution }

S_2 = " " "

(S_1) d_1 = Degree of freedom

(S_2) d_2 = " "

F Test : Variance Ratio Test