Physics 341 - Lecture 18

(1) → Comparing two std. dev. to one another | F-test |

(2) → Remainder of Assignment 4

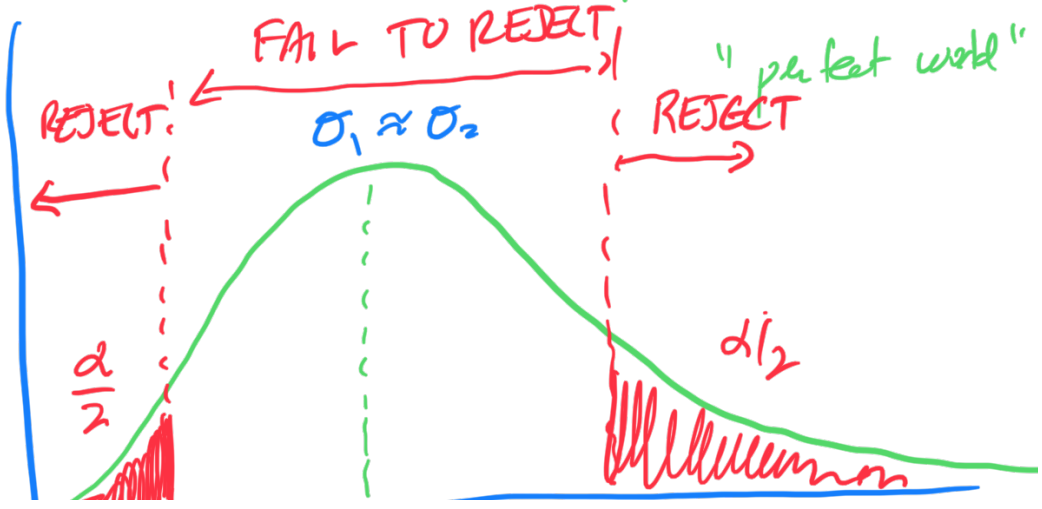
	Compare means	Compare std. dev.
Known σ	z	χ^2
Unknown σ	t	?

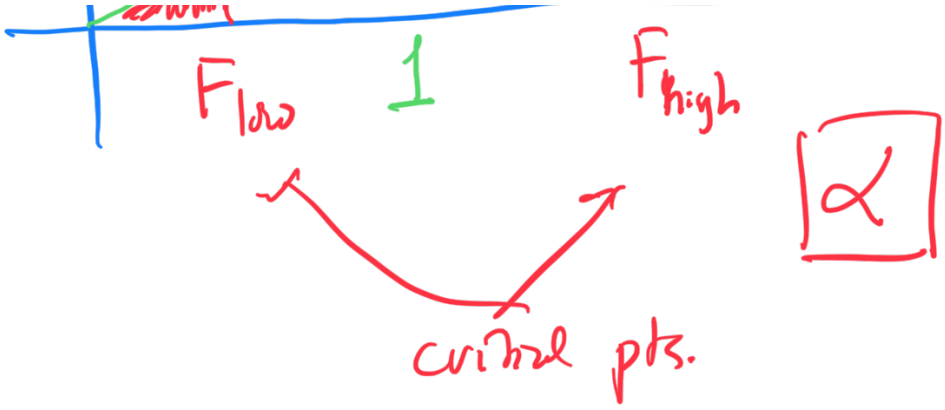
$$\chi^2 = \frac{(N-1)S^2}{\sigma^2}$$

New situation $\quad \frac{\sigma_1 \text{ vs. } \sigma_2}{S_1 \qquad S_2}$?

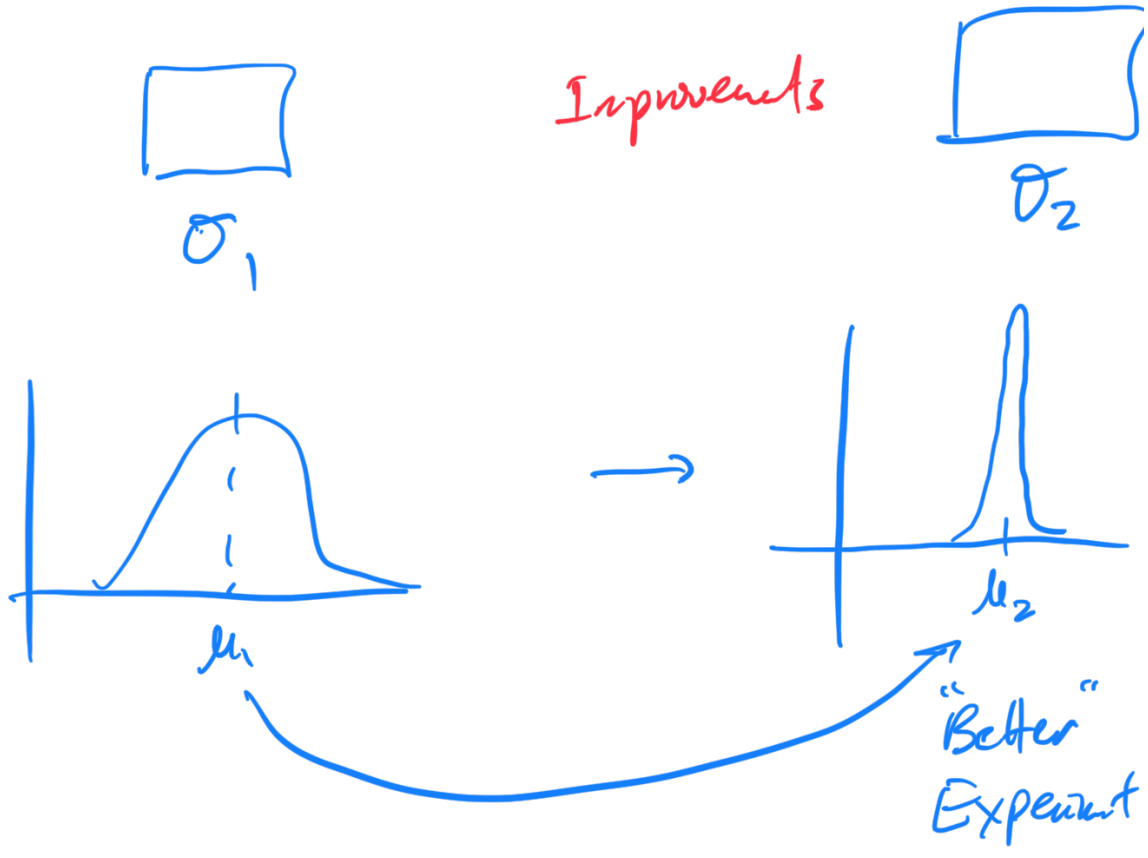
$$F_{data} = \frac{S_1^2}{S_2^2} \geq 0$$

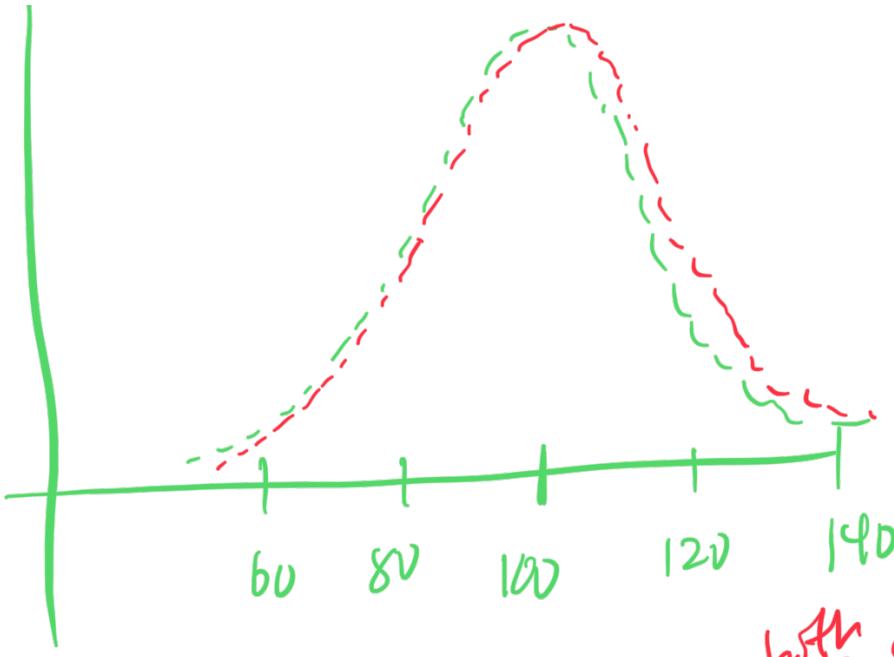
$$0 \leq F \leq \infty$$

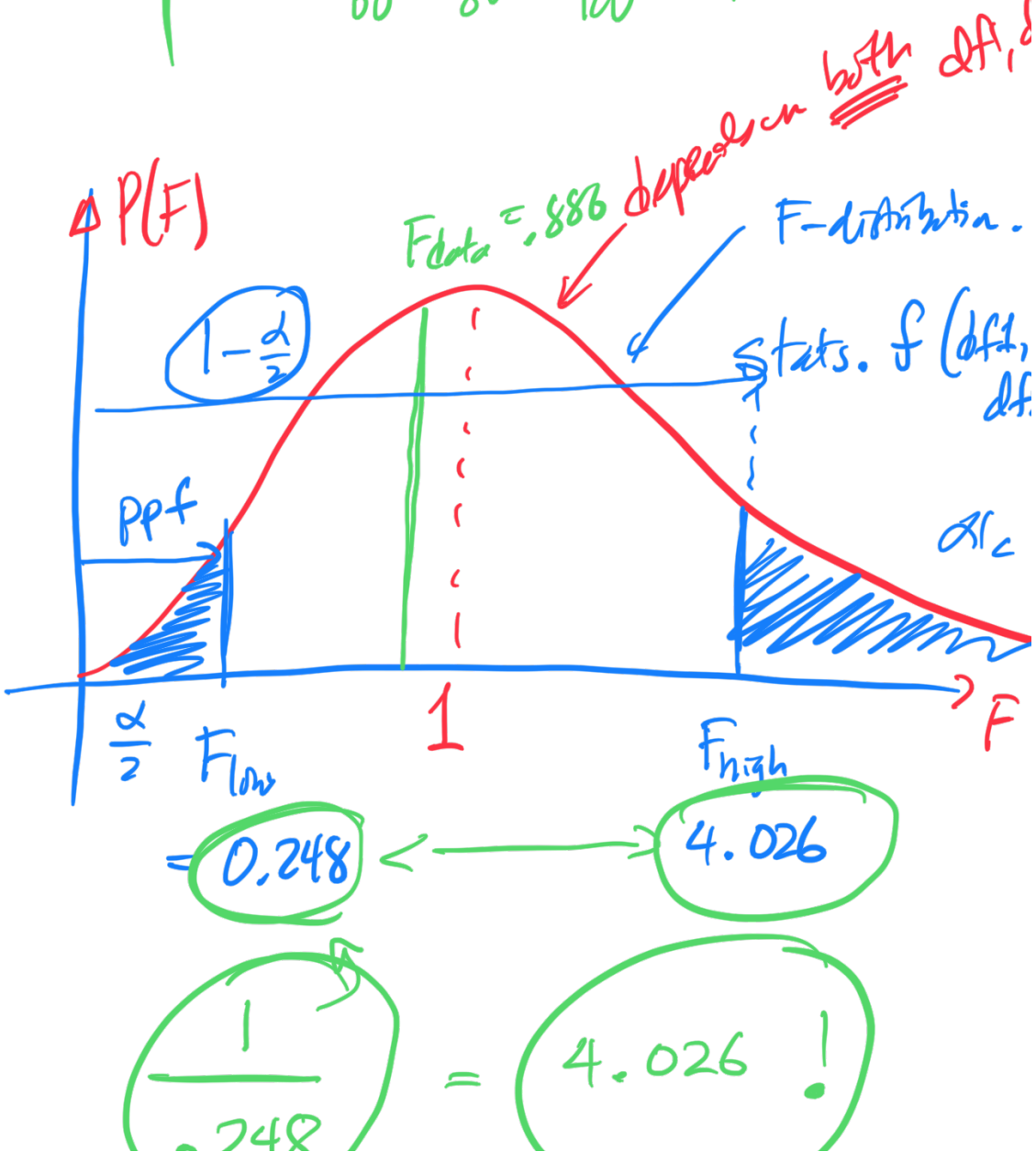




INDUSTRIAL PROCESS OPT.







$= 0.248 \longleftrightarrow 4.026$

$\frac{1}{.248} = 4.026$!

$$F = \frac{s_1^2}{s_2^2}$$

$$= \frac{s_2^2}{s_1^2}$$

Question 7 → Mechanics of f-distribution

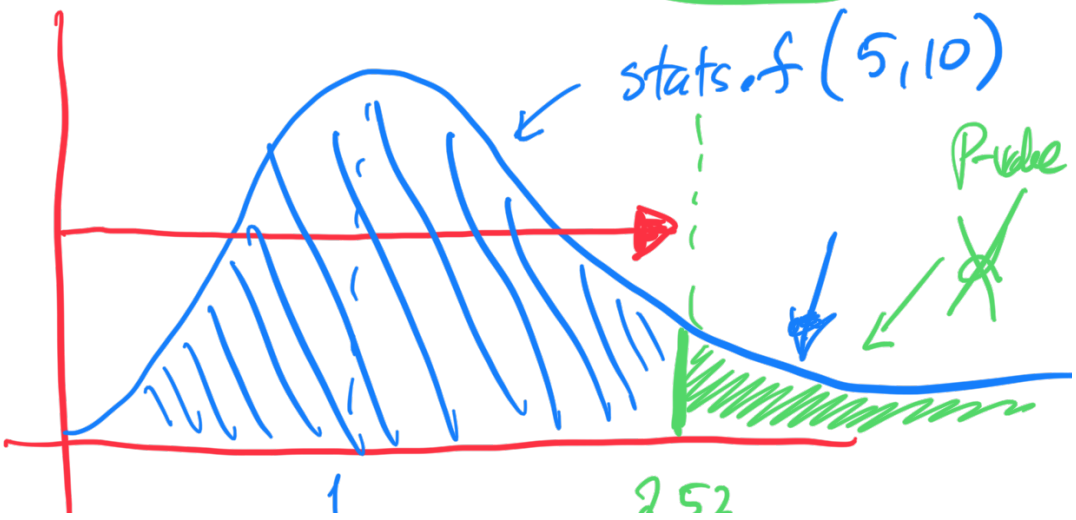
(a) $\nu_1 = 5$, $\nu_2 = 10$

df_1 df_2

$H_a: \sigma_1^2 > \sigma_2^2$

"upper-tailed test"

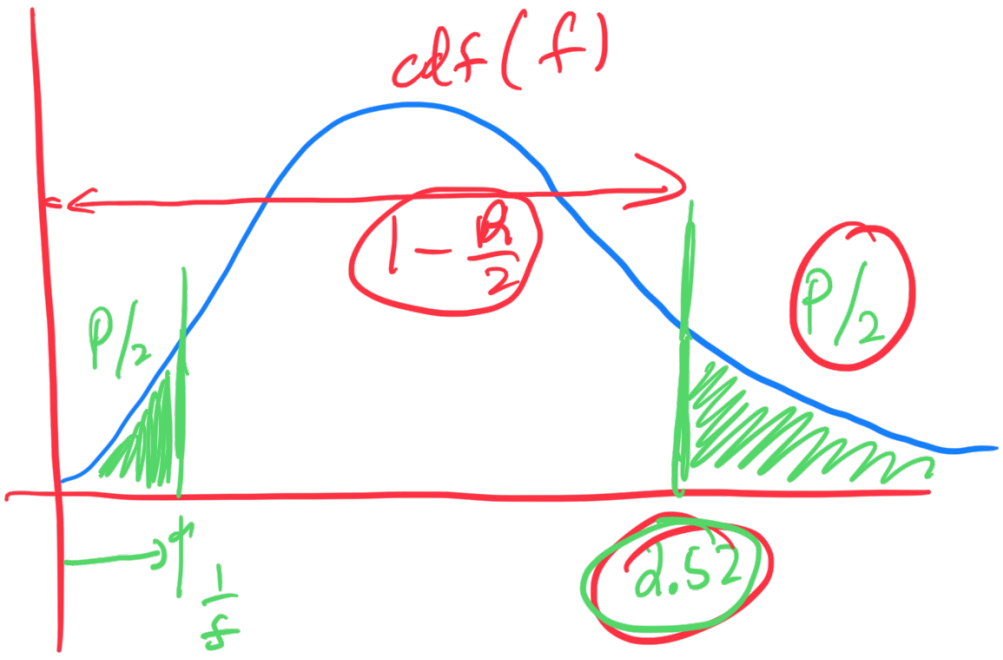
$f = 2.52$



$f = stats.f(5, 10)$

$pr = f.cdf(2.52)$

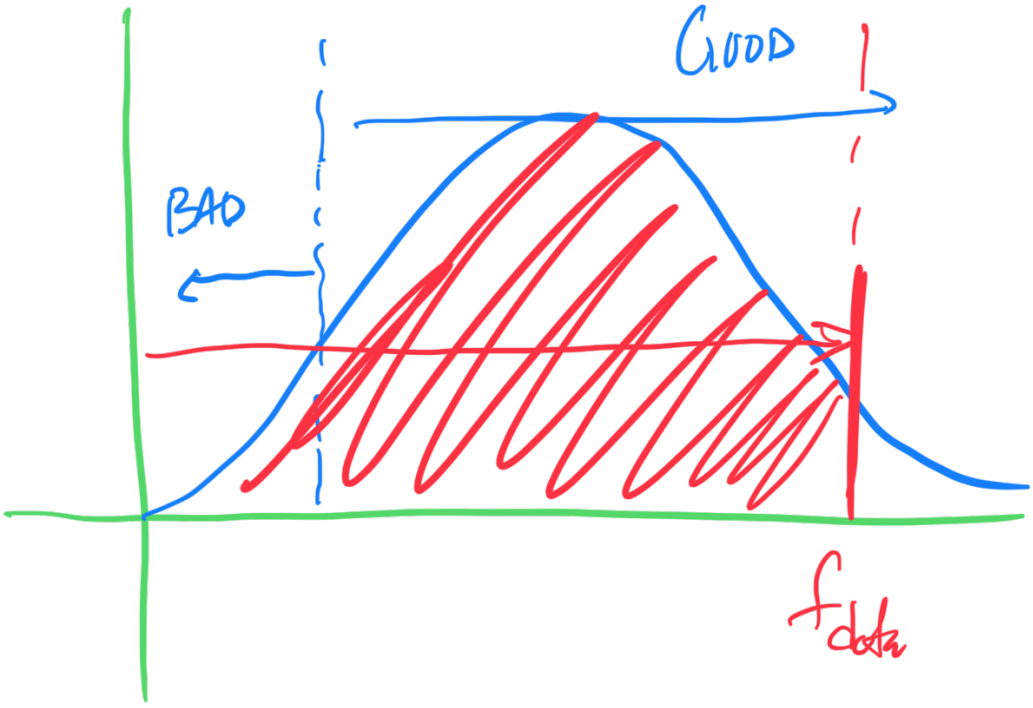
$p = 1 - f.cdf(2.52)$

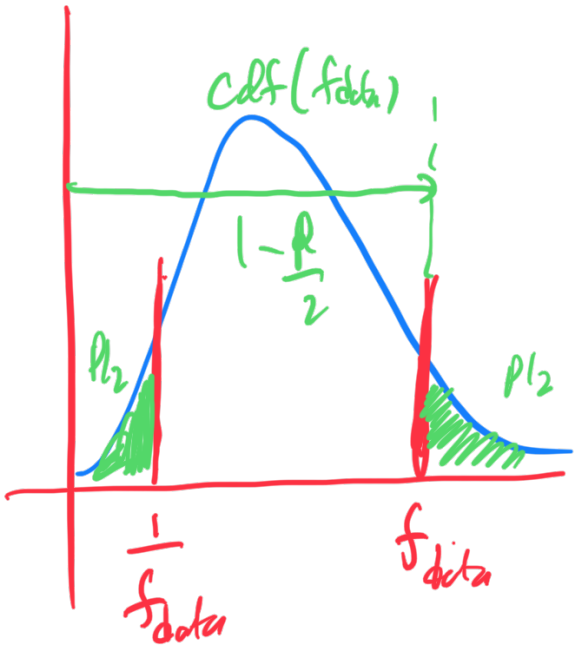


$cdf\left(\frac{1}{f}\right)$ $1 - \frac{p}{2} =$ fdist.cdf(f)

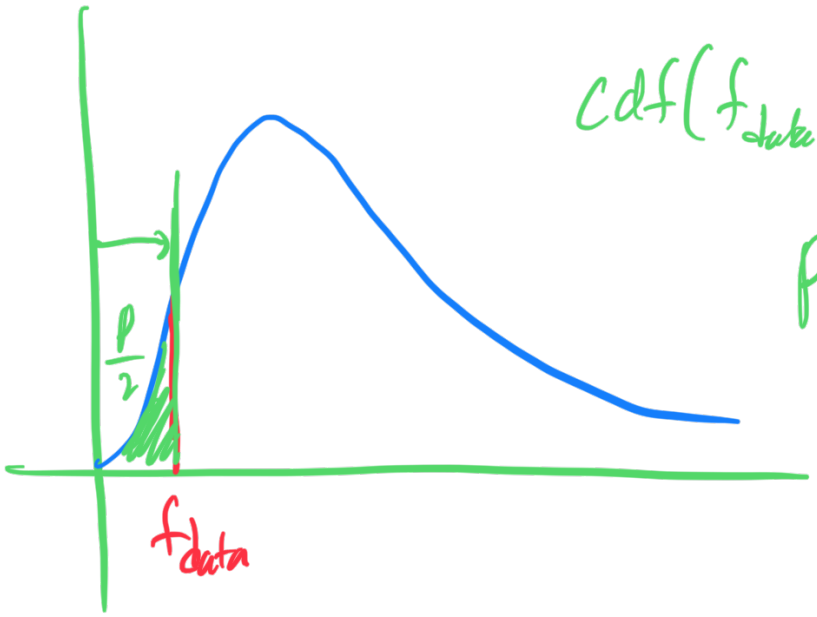
$= p/2$ $p = 2\left(1 -$ fdist.cdf(

$$p = 2 * fdist.cdf\left(\frac{1}{f}\right)$$





$$p = 2(1 - cdf(f_{data}$$



$$cdf(f_{data}) = \frac{p}{2}$$

$$p = 2 * cdf($$