a) $R^2 = R^2_{adj}$

$\cancel{1} - \frac{SSE}{SST} = \cancel{1} - \frac{(n-1)MSE}{SST}$

$\cancel{\frac{SSE}{SST}} = \frac{(n-1)\cancel{SSE}}{(n-p)\cancel{SST}}$

$n-p = n-1$

¿$p = 1$? ✓

$R^2 < R^2_{adj}$

$1 - \frac{SSE}{SST} < 1 - \frac{(n-1)SSE}{(n-p)SST}$

$\frac{SSE}{SST} > \frac{(n-1)}{(n-p)}\frac{SSE}{SST}$

$n-p > n-1$

$p < 1$ NO

No es posible pues $p = k+1 = 1 \Rightarrow k = 0$

b) $\hat{\sigma}^2 = MSE = \frac{\overset{>0}{SSE}}{\underset{>0}{n-p}} > 0$

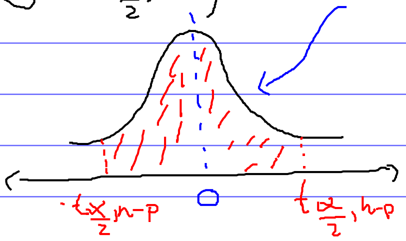
$n-p > 0 \Rightarrow n > p \Rightarrow n > k+1 \Rightarrow n \geq k+2$

El # mínimo de observaciones es $k+2$

c) $U = \frac{\hat{Y}_0 - E[Y|X_0]}{SE(\hat{Y}_0)} \sim t_{n-p}$

(1) $P\left(-t_{\frac{\alpha}{2},n-p} < U < t_{\frac{\alpha}{2},n-p}\right) = 1-\alpha$

Distribución t



(1) $= 2P(0 < U < t_{\frac{\alpha}{2},n-p}) = 1-\alpha$

$P(0 < U < t_{\frac{\alpha}{2},n-p}) = 0.5 - \frac{\alpha}{2}$

d) Como con $\underline{X}_0$ no se extrapola se cumple

$\underline{X}_0^T(XX^T)^{-1}\underline{X}_0 < \max\{h_{ii}\}$

y $h_{ii} < 1$, en particular $\max\{h_{ii}\} < 1$

$\Rightarrow \underline{X}_0^T(XX^T)^{-1}\underline{X}_0 < 1$

e) $\bar{h} = \frac{p}{n} \Rightarrow n\bar{h} = p \Rightarrow \sum_i h_{ii} = p$

5) Como $2p > n \Rightarrow \frac{2p}{n} > 1 \Rightarrow$ No funciona el criterio