

Stat 215b (Spring 2004): Some formula for simultaneous confidence intervals

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Suppose we are interested in simultaneous confidence intervals for linear combinations of the form $c'\beta$. We will look for $100(1 - \alpha)\%$ confidence intervals. There are two methods we can use.

Scheffe Simultaneous Intervals

$$c'\hat{\beta} \pm \sqrt{qF_{q,n-p}^{(1-\alpha)}} s \sqrt{c'(X'X)^{-1}c}$$

where q is the number of β involved in all the intervals being compared

Bonferroni Simultaneous Intervals

$$c'\hat{\beta} \pm t_{n-p}^{(1-\alpha/(2l))} s \sqrt{c'(X'X)^{-1}c}$$

where l is the number of linear combinations we are computing intervals for.