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Module 10 Discussion

Thanks for providing a page reference to your discussion. I was looking for something along these lines, but I wasn't able to find it in my own search. Therefore, I ended up trying to think of my own reasons to support my argument, but it was admittedly quite difficult. I think the idea about the determinant of the $\mathbf{X}'\mathbf{X}$ matrix is quite important. The reason is that in the subset selection techniques, the calculation requires that the partial F statistic is calculated. This however is based on finding the SS_R, which in turn depends on $\widehat{\boldsymbol{\beta}}$, which in turn depends on $(\mathbf{X}'\mathbf{X})^{-1}$. I was thinking that the orthogonal regressors would have an impact on this calculation but couldn't find it directly. It's interesting to see here that in the case of orthogonal regressors that the this evaluates to 1 and 0 if there is linear dependence.

I think that another interesting point is that from a simple view of the theory, we'd want the regressors to be at least close to orthogonal, if not entirely orthogonal. That is, we'd want our independent variables to be as independent as possible. The issue arises I believe when they aren't independent, and multicollinearity arises.

I saw your reply to my discussion response also, and I see that we had interpreted the discussion question differently. I think based on simply looking at $r_{x_i,y}$, it could be difficult to determine the chosen subset of regressors. I also think that it would take further analysis, since looking at $r_{x_i,y}$ compares the dependent response to one of the independent variables, while the orthogonal characteristic amongst the regressors seems somewhat apart from that fact.