Newsom
PSY 591 Multivariate Analysis

Summary of Regression Diagnostics

Measure	Description	Approximate Cutoff (for identifying a problem)	Source
Outliers			
(Internally) Studentized Residuals	Indicates outlier on y.	t (df = n - p - 1). For quick reference: > 2.5 or 3.0	NWK
Studentized Deleted Residuals	Indicates outlier on y. i^{th} case removed.	t (df = n - p - 1). For quick reference: > 2.5 or 3.0	NWK
Leverage (h_{ii})	Also called hat values. Multivariable outlier (on x) based on distance from mean of x.	> 2p/n. For quick reference: .5 high, .2-.5 mod.	NWK
Mahalanobis	Multivariate distribution outlier on x.	$> \chi^2$ (df = p - 1, α = .001)	TF
Influential cases			
Cook's Distance	Influence on all coefficients. Partly a function of unstandardized residuals and leverage.	> 4/n. Quick reference: substantially larger than 1.	BJ
DFFits*	Based on change in MSE by deleting i^{th} case. Partly a function of studentized deleted residuals and leverage.	> 1, for small n. $> 2\sqrt{p/n}$, for large n.	BJ
DFBetas*	Change in regression coefficients by deleting i^{th} case.	> 1, for small n. $> 2/\sqrt{n}$, for large n.	BJ
COVRATIO	Change in the joint confidence region (standard errors) by deleting i^{th} case. Partly a function of h and studentized residuals.	Substantially larger or smaller than 1. Alternatively, |COVRATIO - 1| > 3p/n COVRATIO > 3p/n + 1 or COVRATIO < 3p/n - 1	F
Multicollinearity			
Variance Inflation Factors (VIF)	A function of the inflation of the variances of b.	> 6 or 10	NWK
Tolerance	Reciprocal of VIF	< .16 or .10	NWK

(see reverse side of page)

p = k + 1
(number of predictors plus the intercept)