KAAP 602

Statistics

Lecture #3 Notes

1. Review SPSS homework on correlation, simple linear regression, polynomial regression.
2. Review residuals: Residuals are the difference between the actual scores and the predicted scores.
3. Residuals determine the Standard Error of Estimate, which is the standard deviation of the residuals.
4. Standard Error of Estimate is a measure of the accuracy of the equation.
5. Explain the meaning of r2 (use Ven diagrams):
	1. r2 = proportion of variance in Y explained by X (predicted variance)
		1. $Σ\left(Y^{'}-\overbar{Y}\right)^{2}/\left(N-k\right)$
	2. (1-r2) = proportion of unexplained variance (residual)
		1. $Σ\left(Y-Y'\right)^{2}/\left(N-k\right)$
	3. Predicted variable is correlated with residuals (1-r2).
	4. Residuals not correlated with predictor variable (r = 0).
	5. Predicted values and predictor variable perfectly correlated.
6. Explain concept of Partial Correlation
	1. Used to remove confounding variables
		1. ie: Remove age from correlation between running speed and height among elementary grades 1-6.
	2. Correlation between residuals.
		1. Remove age from speed using simple regression.
		2. Remove age from height using simple regression.
		3. Correlate residuals.
7. Explain concept of semi-partial (or part) correlation
	1. Forms the basis of regression analysis
	2. Prevents contributions to explained variance in Y from being “double counted”
8. Introduce multiple regression
	1. Uses 2 or more independent variables to explain or predict dependent variable.
	2. Multiple semipartial correlations
	3. R2 is equal to the sum of the semipartial correlations squared.
	4. Standard error of Estimate
	5. Use of b-weights
	6. Use of Beta weights
	7. Checking for tolerance
		1. What to do if multicollinearity is present
	8. Checking for linearity
	9. Identifying significant variables
	10. How many cases?
	11. Method Enter
	12. Method Stepwise
	13. Method Forward
	14. Method Backward
	15. Show example
	16. Cross validation