MS Module 16: Regression estimates (overview)

(The attached PDF file has better formatting.)

Reading: §12.2 Estimating model parameters

The textbook shows how to derive the least squares estimators for β_0 and β_1 by the normal equations and then by the computational formulas using the summary statistics.

- Know how to derive S_{xx} and S_{xy} from the summary statistics.
- Know how to derive β_1 from S_{xx} and S_{xy}.
- Know how to derive β_0 from $\bar{x}$, $\bar{y}$, and β_1.

Know how to derive also the estimates of σ^2, σ, R^2, and ρ from the summary statistics. A final exam problem may give summary statistics and ask for β_0, β_1, σ^2, and R^2.

Review the practice problems on the discussion forum. Some final exam problems give X values as the integers from 1 to N, from which you derive Σx_i and Σx_i^2.

The Excel Analysis ToolPak has a Regression module that calculates most of the values taught in ths course. The ToolPak is particularly useful for ANOVA and for regression analysis, since the numerical computations are time-consuming.

For efficient study, enter the data from a textbook example into a spread-sheet and run the Analysis ToolPak on the data. Compare Excel's solutions to the textbook solutions to ensure that you are using the ToolPak correctly. Then solve the end of chapter exercises and check your answers with the Analysis ToolPak.