

March 31, 2006
Stat 320
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Lab-assignment 7

Problem 1:

A computer repair service is examining the time taken on service calls to repair computers. Data are obtained for 30 service calls. The data are in a file names COMPRER5 on the CD. Information obtained includes:

X1: number of machines to be repaired (NUMBER)

X2: years of experience of service person (EXPER)

Y: time taken (in minutes) to provide service (TIME)

1. Investigate the bivariate scatterplot of Y and X1 and Y and X2
2. Conclusion
3. Develop a polynomial regression model to predict average time on the service calls using EXPER and NUMBER as explanatory variables.

Problem 2:

Mileage and Weight

The variables CITYMPG (y), which is the number of miles per gallon obtained by a car in city driving, and WEIGHT (x), the weight in pounds of the car, are in a file named MPGWT5. This information is available for 147 cars listed in the Road and Track October 2002 issue.

1. Fit the linear regression using CITYMPG as the dependent variable and WEIGHT as the independent variable.
2. Examine a scatterplot of these two variables. Can you find a curvilinear model that better describes the relationship between these two variables?

Problem 3:

Research and development

Data: RD6

A company is interested in the relationship between profit (PROFIT) on a number of projects and two explanatory variables. These variables are the expenditure on research and development for the project (RD) and a measure of risk assigned at the outset of the project (RISK). PROFIT is measured in thousands of dollars and RD is measured in hundreds of dollars.

1. Provide the scatterplots of PROFIT versus RISK and PROFIT versus RD
2. Provide the linear regression fit results for the whole model

3. Using any of the given outputs, does the linearity assumption appear to be violated? Justify your answer.
4. If your answer is yes, state how the violation might be corrected.
5. Does your new model appear to be an improvement over the original model?