| Paper STATS 330 | Assignment 1 | Due: Friday 16 August |
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To do your assignments for STATS 330 you may use either (1) the Advanced Lab located in Rooms 133 and 134 of Maths/Physics, or (2) the undergraduate laboratories located in B028 of the Chemistry building and at 9 Mount St., or (3) your home computer. If you are using either (1) or (2) the datasets for assignments will be in a folder called "STATS330" on the "U:drive" of "My Computer". If you are working at home then you can get the data from the STATS 330 webpage, http://www.stat.auckland.ac.nz/~miller/330/ , by clicking on "Data Sets".

A random sample of 25 sales territories for a certain company was taken (the data have been transformed to preserve confidentiality) and the following variables were measured for each territory:

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| **SALES** | sales in units for the territory (response). |
| **TIME** | length of time the salesperson has been with the company. |
| **POTENT** | industry sales in units for the territory. |
| **ADV** | dollar expenditures on advertising. |
| **SHARE** | weighted average of market share for 4 previous years. |
| **SHARECHG** | change in market share over the 4 previous years. |
| **ACCTS** | total number of accounts assigned to the salesperson. |
| **WORKLOAD** | an index that measures the average workload per account. |
| **RATING** | an aggregate rating of performance by the field sales manager. |

The goal of the study was to construct a model to explain sales performance. The fitted model model is to be used to assess whether salespersons in different territories are performing up to standard. The focus of this assignment is to have you construct a suitable model and then evaluate that model.

For this assignment use log(SALES) as the response and construct a simple regression using the remaining variables as regressors (note that there should not be any unnecessary regressors in your model). Your assignment should be divided into a written report and a statistical appendix.

1. The written report should be written in language that a non-statistics major can understand. It should present the model you have chosen and briefly explain how it can be used to predict SALES. You should assess the precision of estimates obtained using your model. Briefly discuss how the model might be used to identify regions where sales are unusually low.

2. The statistical appendix should briefly describe how you selected your model and evaluated its precision. The statistical appendix should consist of paragraphs – annotated computer output is not acceptable. You may wish to include a few key pieces of output but these must be accompanied by a written explanation. Also, assess the adequacy of the model using simple diagnostic procedures (note that you are not asked to fix up the model). In particular, discuss whether using log(SALES) for the response was sensible.

This assignment should be handed in to the appropriate box in the basement of the Maths/Physics building by the Resource Centre, by 4pm on Friday, 16 August.