Paper STATS 330 **Assignment 3** **Due: Friday 28 September, 2001**

In this assignment you will explore data that summarises the outcomes of 58 simulated side impact automobile collisions using crash-test dummies. In each crash, the following variable were measured.

Age: "age" of the crash-test dummy.
Acl: maximum acceleration on impact measured on the dummy's abdomen.
Vel: velocity of automobile at impact.
Y: 1 if the accident would be fatal, 0 otherwise.

A data frame containing this data called collide.df has been created in Splus on the advanced lab server. To access this data simply logon to the advlab computer, start Splus and type

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> collide.df
```

If you want to use your own computer, the data set can also be obtained from the "Data Sets" page of the STATS 330 Webpage.

For this assignment, first fit a logistic regression model that predicts the probability of a fatal crash, π, as a function of all three explanatory variables. Then investigate the possibility of eliminating some of the explanatory variables from the model. Once you have identified a suitable model, use this model to explain how the explanatory variables affect π. Your report should be understandable to a non-statistics major. It should clearly communicate how π is affected by the other variables and what values of π would be expected in practice (a well chosen plot or table might be useful). Further, your discussion should take into account the uncertainty in your fitted model.

This assignment is intended to test your understanding of the logistic regression model and your ability to use such a model. Therefore, the majority of marks will be given for your explanations of what the model indicates about π.

In addition to your report, your assignment should include a short statistical appendix that briefly explains to the marker what you did. Identifying a suitable model should not be too difficult but you need to justify your choice. For this assignment, you are only expected to use the material covered in Lecture Notes 7.

This assignment should be handed in to the appropriate box in the basement of the Maths/Physics building by the SMIS Resource Centre, by 4pm on Friday, 28 September.