Final Exam

1. I generated data from the GSS website cross-tabulating Happy (1=Very Happy, 2=Pretty Happy, 3=Not Too Happy), Health (1=Excellent, 2=Good, 3=Fair, 4=Poor) and Educ (0=Less than High School, 1=High School, 2=Junior College, 3=Bachelor, 4=Graduate). We will study cumulative logit models with Health as the response, and Educ and Happy as ordinal covariates.

   (a) Test the proportional odds main effects model for Happy and Educ. Comment on test results for model terms and the proportional odds assumption. Explain.

   (b) Divide all observations by 30 and re-run the model (*Note: I do not advise this as acceptable practice*). Compare results to results with the original data. Interpret the parameter coefficients (but not the intercept estimates) as odds, and comment on the modelling results.

   (c) Fit a non-proportional odds main effects model to the smaller data set (You will need to use the ADDCELL option in the MODEL command for PROC CATMOD). Interpret the parameter estimates as odds.

   (d) Compare and contrast the proportional odds model and non-proportional odds models.

2. Two ordinal variables are being studied for strength of association. Results from an experimental study appear in the table below:

		C		
R	1	2	3	4
1	51	42	33	19
2	39	53	60	66
3	70	87	112	117
4	77	49	58	67

   (a) Test for independence, then test for linear-by-linear association. Comment on goodness of fit.

   (b) It is also possible to test ANCOVA-type models (Row association and Column association models) by including interactions between a row (column) factor and a column (row) covariate. Test these models as well.

   (c) Compare your 4 models; which seems to provide the best fit? Compute odds ratios to support your conclusion.