Stat 705 Homework 7

I posted some sample SAS code that does most of what you need for the following problems.

- **Flu shots**: 14.14(a,b,c), 14.20(b), 14.22(a,b), 14.28(b,c), 14.32(a,b), 14.36(a). For 14.28(a,b), use a first-order model with x_1 & x_2 (age & awareness) only; 14.28(b) just use the standard SAS output from LACKFIT. For 14.32 and 14.36, use the model with just x_1 & x_2.

- **Falls**: For the data of problem 14.39, plot the numbers of falls Y_i versus each predictor and describe what you see. Fit a standard regression model to these data and plot residuals versus the fitted values. Is constant variance reasonable here? Now fit Poisson regression. 14.39 (a,c,d). Use the standard Wald test for (c) from SAS. Finally, obtain the studentized Pearson residuals and plot then versus fitted values and each predictor x_1, x_3, and x_4 to check model fit. Does it fit okay?

- Consider the **helicopter service** data from your first homework. These data are *counts*. Fit a Poisson regression model with log-link to these data *on the original scale* and intepret. Here's some sample code:

```
proc genmod data=helicopter plots=all;
 class shift;
 model count=shift / dist=poisson link=log type3;
run;
```

  1. We look for the Pearson goodness-of-fit statistic divided by its degrees of freedom to be close to one, and no greater than two. Is that the case here?
  2. Examine a plot of the Pearson residuals versus the linear predictor. There should be no pattern and roughly constant variance. Is that the case?
  3. The Type III likelihood ratio tests whether there is any difference due to shift, much like the overall F-test in ANOVA. What do you conclude at the 5% level?