

STAT 645

Categorical Data Analysis

Assignment IV

Generalized Linear Models

Readings

§4.1 - 4.5, §5.1 - 5.3.2, look over Appendix §A.6-A.8

Exercises (Along with any additional comments)

4.1

4.2

5.2

5.3 Find, plot, and compare the fitted probabilities for a linear link, logistic link, and probit link. Use the below code

5.3 (same data) Recode the explanatory variable to $\{2, 3, 4, 5\}$. Rerun the example from class for getting the estimated probabilities and their confidence intervals. How do the results of this new coding compare?

Due Date: March 24

```

data glm;
input snoring disease total;
cards;
0 24 1379
2 35 638
4 21 213
5 30 254
;
run;

data glm;
  set glm;
  id = _n_;
run;
proc genmod data=glm;
  model disease/total = snoring / dist=bin link=identity ;
  output out=temp1 p=pid;
run;
proc genmod data=glm;
  model disease/total = snoring / dist=bin link=logit ;
  output out=temp2 p=plogit;
run;
proc genmod data=glm;
  model disease/total = snoring / dist=bin link=probit;
  output out=temp3 p=pprobit;
run;

data combo;
  merge temp1 temp2 temp3;

```

```
    by id;
    prop = disease/total;
    no = total - disease;
run;
proc print data = combo;
    var snoring disease no prop pid plogit pprobit;
run;

symbol1 v=dot line=1 c=blue h=.4 i=join;
symbol2 v=_ line=2 c=red h=.4 i=spline;
symbol3 v=$ line=3 c=green h=.4 i=spline;
axis1 label=(angle=90 'Predicted Probabilities') order=(0 to .2 by .05);
legend label=none value=(h=1 font=swiss 'Linear' 'Logit' 'Probit')
    position=(bottom right inside) mode=share cborder=black;
proc gplot data = combo;
    plot (pid plogit pprobit)*snoring/overlay vaxis=axis1 legend=legend1;
run;
quit;
```