

BST 140.753 Assignment 5

February 28, 2005

Fine print Please feel free to give each other small hints, but otherwise students must complete assignments individually. Assignments can be hand written, but note that sloppily prepared work will be returned ungraded.

1. This problem involves the following win-loss data for the 1987 AL.

Home Team	Away Team						
	Mil	Det	Tor	NY	Bos	Clev	Balt
Mil	-	4-3	4-2	4-3	6-1	4-2	6-0
Det	3-3	-	4-2	4-3	6-0	6-1	4-3
Tor	2-5	4-3	-	2-4	4-3	4-2	6-0
NY	3-3	5-1	2-5	-	4-3	4-2	6-1
Bos	5-1	2-5	3-3	4-2	-	5-2	6-0
Cle	2-5	3-3	3-4	4-3	4-2	-	2-4
Balt	2-5	1-5	1-6	2-4	1-6	3-4	-

Table 1: Win-loss data for 1987 AL. The w-l numbers are always for the home team.

- a. Fit a Bradley/Terry model that accounts for home/away team status.
 - b. Does there appear to be a home field advantage?
 - c. Rank the teams, quantify the uncertainty in your rankings.
2. McCullagh and Nelder problem 9.8.
 3. Consider the following table regarding subjects responses regarding three scenarios whether or not they supported legalized abortion in that scenario. An answer of 1 is yes they do support legalized abortion in this setting and 2 they do not.

Gender	Sequence of Responses							
	111	112	211	212	121	122	221	222
male	342	26	6	21	11	32	19	356
female	440	25	14	18	14	47	22	457

consider a model

$$\text{logit}\{P(y_{ij} = 1)\} = \alpha + \beta x_i + \gamma_j$$

where y_{ij} is the response of subject i for question j and x_i is 1 if person i is male and 0 if person i is female.

- Fit a logistic regression model that ignores the correlation for responses on a given subject.
- Fit analogous models using GEE with independence, exchangeable and unstructured working correlation matrices.
- Fit a random intercept logit/normal model
- Explain the difference between population averaged and subject specific effects in the context of this example.