

APPENDIX 1

1) Matlab command for fitting GLM :

(B, DEV, STATS)=GLMFIT (X, Y, 'DISTR', 'LINK', 'ESTDISP', OFFSET, PWTS, 'CONST') this commands fit GLM using the Design matrix X, response Y, and distribution DISTR.

Other options provides more control over the fit.

LINK is the link function, 'ESTDISP' is 'on' to estimate dispersion parameter in computing standard errors, or 'off' to use the theoretical dispersion parameter value, OFFSET is a vector that is used as an additional predictor but with a coefficient value fixed at 1.0, PWTS is a vector of prior weights, 'CONST' can be 'on' (the default) to include a constant term or 'off' to omit it. The coefficient of the constant term is the first element of B. (Do not enter a column of ones directly into the X matrix.)

This command give result in the terms B vector of coefficient estimation DEV is the value of the deviance at the solution. STATS is a structure that contains the following fields:

dfe: (degrees of freedom for error), s (theoretical or estimated dispersion parameter), sift: (estimated dispersion parameter), se (standard errors of coefficient estimates b), coeffcorr: (correlation matrix for b), t (t statistics for b), p: (p-values for b), resid (residuals), residp :(Pearson

residuals), residd: (deviance residuals), resida :(Anscombe residuals).

Example:

i) $(b, dev, sl) = \text{glm fit}(x, (y, n), 'binomial', 'logit')$

This example fits a logit regression model for y on x. Each $y(i)$ is the number of successes in $N(i)$ trials.

ii) $(b, dev, sl) = \text{glm fit}(x, y, 'poisson.', 'log')$ this command fits a log linear model for poisson response variables .

2) Matlab command for computing confidence intervals: Fitted

values and confidence intervals values for GLM.

$(YHAT, DYLO, DYHI) = \text{GLMVAL}(BETA, X, LINK, STATS, CLEV)$

computes the fitted values for the GLM with link function LINK and predictor values X. also computes confidence bounds on the predicted Y values. STATS is the stats structure returned by GLMFIT.

CLEV is the confidence level (default 0.95 for 95 confidence bounds).

That gives fitted values DYLO and DYHI define a lower confidence bound of $YHAT - DYLO$ and an upper confidence bounds of $YHAT + DYHI$.