

If R is used, present the required output and the (relevant) syntax.

1. Recall that the  $(t + 1)$ -th iteration used to obtain the ML estimators of  $\beta$  can be written as:

$$\beta^{(t+1)} = (\mathbf{X}^\top \mathbf{D} \mathbf{X})^{-1} \mathbf{X}^\top \mathbf{D} \mathbf{z}$$

where  $\mathbf{D}$  and  $\mathbf{z}$  are obtained using  $\beta^{(t)}$ . Show what is the explicit form of  $\mathbf{D}$  and  $\mathbf{z}$  in terms of  $\hat{\mu}$  and  $\beta^{(t)}$  for the Poisson regression.

(Hint: Check your 2-15-18 notes for the binomial)

2. From ELM<sup>1</sup> Chapter 5 Exercise 1

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<sup>1</sup>Acronym for Extending the Linear Model in R by Faraway