Football Scores*

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First sentence. Second sentence. Third sentence. Fourth sentence.

1 Model set-up

Define y_i as the number of goals a team scores in a game. Then λ_i is the amount of possession they had

$$y_i \sim \text{Poisson}(\lambda_i) \tag{1}$$
$$\mu_i = \alpha + \beta x \lambda_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\tag{5}$$

We run the model in R (R Core Team 2023) using the `rstanarm` package of Goodrich et al. (2022). We use the default priors from `rstanarm`.

1.1 Model justification

We use a poisson model in this case due to the relationship being between one input and one output. The input variable is the possession and a team possesses the ball many times throughout a game whereas the output variable being the number of goals scored where the probability of a goal being scored in each possession is relatively small. We assume each goal scoring chance from possession is independent of each other and therefore this follows a binomial which can be approximated to the poisson.

*Code and data are available at: https://github.com/Rahul-Uoft/Football-scores.git

	Goals
(Intercept)	2.291
Possession	0.033
Num.Obs.	20
Log.Lik.	−81.888
ELPD	−85.2
ELPD s.e.	10.3
LOOIC	170.3
LOOIC s.e.	20.5
WAIC	170.2
RMSE	11.30

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. "Rstanarm: Bayesian Applied Regression Modeling via Stan." https://mc-stan.org/rstanarm/.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.