Parameters 2019 model 0

Rates for the home and away goals

$$\ln \lambda_k = \ln \alpha_i + \ln \beta_j + \ln \gamma_h$$

$$\ln \mu_k = \ln \alpha_i + \ln \beta_j$$

- i: home team index;

- j: away team index;

- α: attack strength parameter;

- $1/\beta$: defense strength parameter;

- γ_h: home advantage parameter.

Constraint

The constraint for identificability is

$$\sum_{i}^{n} \log(\alpha_i) = \sum_{i}^{n} \log(\beta_i).$$

```
options(knitr.kable.NA = "-")
options(scipen = 999)

library(dplyr)
library(knitr)

load("data/input.RData")
load("data/mod_0.RData")
```

```
alphas_betas = tibble(Team = times$Time,
              alpha = exp(mod_0$alpha),
              beta = exp(mod_0$beta))
kable(alphas_betas, digits = 4, caption = "Alphas and betas",
      col.names = c("Team", "$\\alpha$", "$\\beta$"))
```

Table 1: Alphas and betas

Team	α	β
Athletico-PR	1.1254	0.6954
Atlético-MG	1.0132	1.0584
Avaí	0.4108	1.2971

Team	α	β
Bahia	0.9835	0.9273
Botafogo	0.6940	0.9556
Ceará	0.8023	0.8757
Chapecoense	0.6998	1.1046
Corinthians	0.9286	0.7311
Cruzeiro	0.6050	0.9722
Csa	0.5454	1.2220
Flamengo	1.9129	0.8400
Fluminense	0.8521	0.9851
Fortaleza	1.1262	1.0649
Goiás	1.0551	1.3856
Grêmio	1.4253	0.8616
Internacional	0.9787	0.8409
Palmeiras	1.3467	0.7039
Santos	1.3261	0.7251
São Paulo	0.8581	0.6426
Vasco da Gama	0.8735	0.9648

```
Parameter = "$\\gamma_h$"
param = tibble(Parameter,
               Estimative = exp(mod_0$gamma))
kable(param, digits = 4, caption = "Other parameters")
```

Table 2: Other parameters

Parameter	Estimative
γ_h	1.4957

```
mod_0$loglik
```

```
## [1] -663.6837
```