Assignment 8

LOO-CV model comparison

anonymous

1 General information

This is the template for assignment 8. You can download the qmd-file or copy the code from this rendered document after clicking on `</> Code` in the top right corner.

Please replace the instructions in this template by your own text, explaining what you are doing in each exercise.

2 A hierarchical model for chicken weight time series

2.1 Exploratory data analysis

2.1.1 (a)

```
# Useful functions: ggplot, aes(x=...), geom_histogram
```

2.1.2 (b)

```
# Useful functions: ggplot, aes(x=...,y=...,group=...,color=...), geom_line
```

2.2 Linear regression

2.2.1 (c)

In `brms`, a regression can be specified as below, see also below (#m) or the last template. Fill in the appropriate variables, data, and likelihood family. Specify the priors, then run the model (by removing `#| eval: false` below).

```
priors <- c(
  prior(normal(0, <value>), coef = "Time"),
  prior(normal(0, <value>), coef = "Diet2"),
  prior(normal(0, <value>), coef = "Diet3"),
  prior(normal(0, <value>), coef = "Diet4")
)

f1 <- brms::brm(
```

```
  # This specifies the formula
  <OUTCOME> ~ 1 + <PREDICTOR> + <PREDICTOR>,
  # This specifies the dataset
  data = <data>,
  # This specifies the likelihood / the observation family
  family = <observation_family>,
  # This passes the priors specified above to brms
  prior = priors,
  # This causes brms to cache the results
  file = "f1"
)
```

2.2.2 (d)

```
# Useful functions: brms::pp_check
```

2.2.3 (e)

```
# Useful functions: brms::pp_check(..., type = ..., group=...)
```

2.3 Log-normal linear regression

2.3.1 (f)

```
log_priors <- c(
  prior(normal(0, log(3)), coef = "Time"),
  prior(normal(0, log(5)), coef = "Diet2"),
  prior(normal(0, log(5)), coef = "Diet3"),
  prior(normal(0, log(5)), coef = "Diet4")
)
```

2.4 Hierarchical log-normal linear regression

2.4.1 (g)

2.4.2 (h)

2.5 Model comparison using the ELPD

2.5.1 (i)

```
# Useful functions: loo, loo_compare
```

2.5.2 (j)

```
# Useful functions: plot(loo(...), label_points = TRUE)
```

2.5.3 (k)

2.6 Model comparison using the RMSE

2.6.1 (l)