

# 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)