Bernoulli and linear regression models

With more notes on building Stan models

Welcome to the fifth workshop of the BayesCog course!

Purpose of this workshop

Having introduced basics of Stan with our binomial model in the previous workshop, we will now implement two new types of models: **the Bernoulli model and linear regression.** We will understand how the Bernoulli is linked to the binomial model, describing the same underlying process (binary outcomes) but at an individual trial level. Meanwhile, linear regression will introduce us to models with multiple parameters and continuous outcomes. In doing so, we will also build further knowledge of the Stan language, including variable declaration, control flow and variable scope.

The goals of this workshop are to:

- Learn how to implement a Bernoulli model in Stan for modeling binary outcome data
- Master the principles of Bayesian linear regression and its implementation in Stan, including working with multiple parameters and continuous variables
- Gain deeper proficiency in Stan's programming features, including vectorization and efficient coding practices
- Practice model validation using posterior predictive checks and diagnostic tools

> **i** Working directory for this workshop
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> Model code and `R` scripts for this workshop are located in the (`/workshops/03.bernoulli_coin`) and (`/workshops/04.regression_height`) directories. Remember to use the `R.proj` file within each folder to avoid manually setting directories!

The copy of this workshop notes can be found on the course GitHub page.