STATISTICAL RETHINKING 2026
HOMEWORK B06

In the lecture, we modeled the island tools data using a Gaussian process on location to adjust for spatial autocorrelation. Now I want you to model the effect of each society's population size using the same approach.

Construct a distance matrix for the log-population values for all pairs of islands. This matrix should look like the distance matrix, but the entries should be absolute differences between the log-population values of each society. You can normalize the matrix as well, so the largest value is 1. This will help with choosing priors.

Then add another Gaussian process to the islands model that models the effect of population, using the matrix you just constructed. The population variable itself should not appear anywhere in your model, except in the distance matrix.

What relationship between log-population size and tool counts does the Gaussian process find? Can you compare this to the log-linear trend assumed in the earlier model? What do you conclude?