

Assignment 2

Loyn (1987) selected 56 forest patches in southeastern Victoria, Australia, and related the abundance of forest birds in each patch to six predictor variables

- patch area (ha)
- distance to nearest patch (km)
- distance to nearest larger patch (km)
- grazing stock (1 to 5 indicating light to heavy)
- altitude
- years since isolation (years).

Three of the predictor variables (patch area, distance to nearest patch and distance to nearest larger patch) were highly skewed, producing observations with high leverage, so these variables were transformed to \log_{10} .

To do

1. Do all necessary descriptive statistics. Show also the necessity for the logarithmic transformation of the predictor variables.
2. Compute the multiple linear regression and interpret all coefficients and significance values. Write down the null and alternative hypothesis. Write down the estimated model. Which variable has the highest impact. How much of the variance does each variable explain?
3. Do a profound diagnostic check of the model including the analysis regarding multicollinearity.

Reference

Loyn, R. H. (1987). Effects of patch area and habitat on bird abundances, species numbers and tree health in fragmented Victorian forests. In: *Nature Conservation: the Role of Remnants of Native Vegetation* (Saunders, D. A., Arnold, G. W., Burbidge, A. A. & Hopkins, A. J. M. eds), pp. 65–77. Surrey Beatty & Sons, Chipping Norton, NSW.