Statistical Inference: Course Project

rtaph

Part II: Tooth Growth

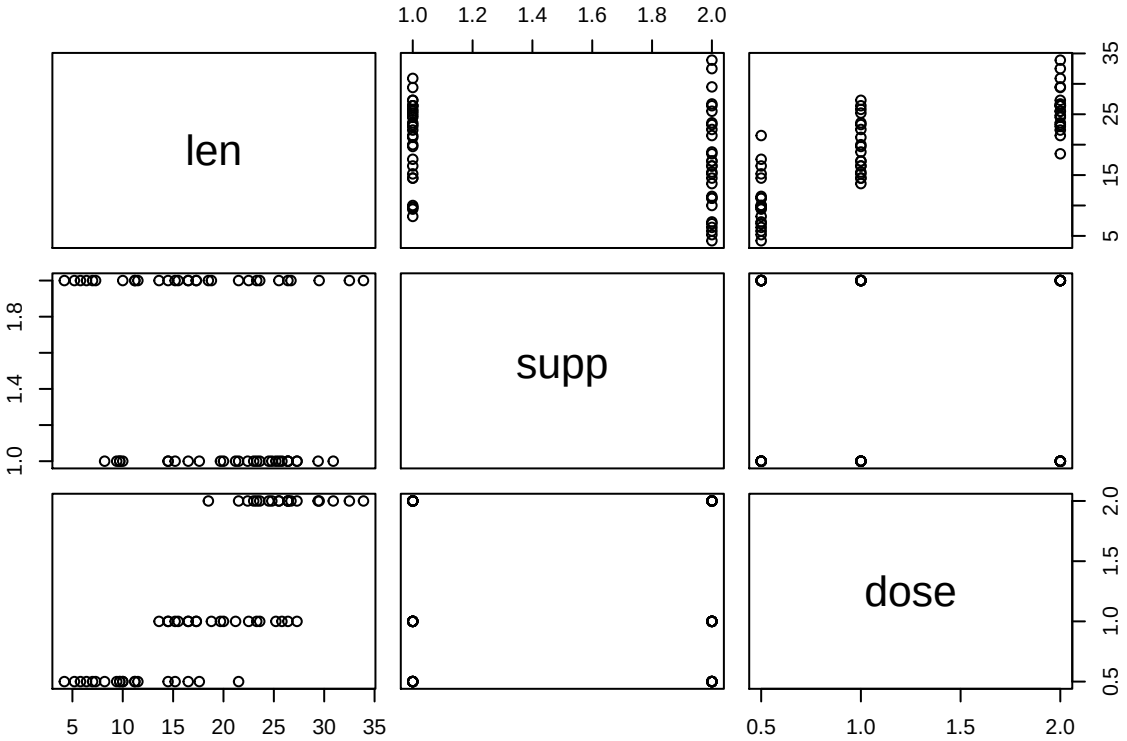
This paper will explore the ToothGrowth data in the R datasets package. In particular, the objective is to draw a few meaningful and valid conclusions about the data, using hypothesis tests.

The `?ToothGrowth` page gives insight into the dataset. Three variables describe the length of odontoblasts (teeth) in each of 10 guinea pigs at each of three dose levels of Vitamin C (0.5, 1, and 2 mg) with each of two delivery methods (orange juice or ascorbic acid): - **len:** Tooth length - **supp:** Supplement type (VC or OJ) - **dose:** Dose in milligrams

The data comes from C. I. Bliss (1952) *The Statistics of Bioassay.* Academic Press

To begin the analysis, we load the data and plot each variable against the others:

```
library(datasets); data(ToothGrowth);
pairs(ToothGrowth)
```



At first glance, it appears that there is a strong relationship between tooth length and dose. Any relationship between the other variables is less aparent.

Use confidence intervals and/or hypothesis tests to compare tooth growth by supp and dose. (Only use the techniques from class, even if there's other approaches worth considering) State your conclusions and the assumptions needed for your conclusions. Some criteria that you will be evaluated on Did you perform an exploratory data analysis of at least a single plot or table highlighting basic features of the data? Did the student perform some relevant confidence intervals and/or tests? Were the results of the tests and/or intervals interpreted in the context of the problem correctly? Did the student describe the assumptions needed for their conclusions?