MAST30027 Modern Applied, Statistics Assignment2

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1.Introduction

1.1 Background

This report is about evaluating chimpanzee's prosocial tendency by analyzing and fitting models to the data. The experiment has two options, one is the prosocial option, when human students participate in the experiment, they nearly always choose the prosocial option when another student sits on the opposite side of the table. The question is whether a focal chimpanzee behaves similarly, choosing the prosocial option more often when another animal is present.

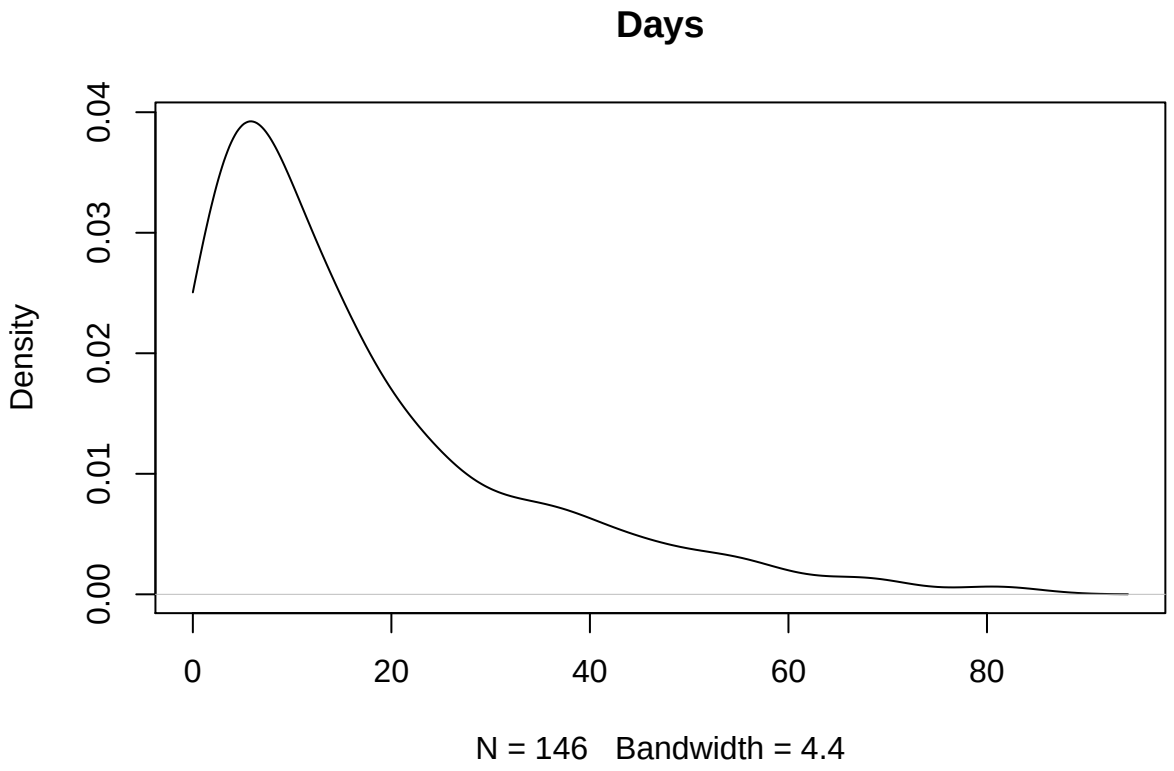
This report will analyse the dataset, visualize it, fit models to it and finally gives a conclusion.

1.2 Data

There are four attributes in the raw data. By looking through the dataset, it is found that there are 7 chimpanzees and every chimpanzee has the same number of instances of data (72 for each chimpanzee), therefore it does not tend to bias towards particular a chimpanzee. It should also be noted that the data is also balanced in condition and prosoc_left attribute, which means that each chimpanzee has 16 experiments on each combination of conditions and prosoc_left.

These are the 4 attributes in the raw dataset. actor (1 to 7) condition (0 or 1): prosoc left (0 or 1) pulled left (0 or 1)

```
# Load the dataset
library(MASS)
data(quine)
plot(density(quine$Days, from = 0),main = "Days")
```




```
r = 1.5
k_hat = mean(quine[,'Days'])

#MLE
p_hat_mle = k_hat/(r+k_hat)
```