

Data Science I TA Audition

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Introduction

The original spreadsheet “dog_weights.xlsx” comes from a friend of Prof. Jeff Goldsmith. It primarily records dogs’ weights on every measurement date for the three dogs: Raisin, Simone, and Gagne. The recording period spans from 2018-08-12 to 2020-06-13. **Our goal** is to see the trend of each dog’s weight and their RER over time.

Data manipulation

After importing and tidying the original spreadsheet, the working dataset “dog_data” now contains 181 observations and 7 variables. On every measurement date (`date`), the dataset contains weight measurements in pounds for each dog (`weight_raisin_lbs`, `weight_simone_lbs`, `weight_gagne_lbs`), and resting energy requirements (RER) in calories for each dog (`rer_raisin`, `rer_simone`, `rer_gagne`) (Appendix Table 1). RER was calculated by multiplying the each dog’s body weight in kilograms raised to the $\frac{3}{4}$ power by 70 [1]. Therefore, we could foresee that the trend of dog weights and RER would be the same.

A descriptive statistics table (Appendix Table 2) and a panel of three boxplots (Appendix Figure 1) were created to show the distribution of each dog’s weight. Both suggested that there were several outlier measurements for each dog. All weight measurements were decided to be kept since the way of data collection was longitudinal and some large deviations in dog weights may require further investigation.

Results

The line plot (Appendix Figure 2) showed that all three dogs had a decreasing trend in dog weights from the beginning to early January 2019. In particular, Raisin was affected the most at this period. After January 2019, Raisin and Simone reached a steady plateau with small deviations in weights. Gagne, however, continued to lose weight until the time of death. A significant drop-off in Raisin’s weight was spotted on the graph, and after re-checking the dataset, this was largely due to a measurement error in weight.

Resting energy requirements for each dog (Appendix Figure 3), as discussed earlier, showed the same trend as the line plot for weights.

Discussion

The early decreasing trend in all three dogs’ weights may result from a change in their living environment. Notes from the original spreadsheet indicated their living at Webers’s places from time to time at this period. A continuous change in living places may affect their appetite and sense of security. There could also be something affecting their health status at Webers’s place, such as rivalry with other dogs on food, harmful living conditions, etc. Before Gagne’s death, we saw that its weight had been decreasing for months. This could be a lesson for us to learn that we should pay attention to the dog’s weight over time since this may indicate how healthy it is.

Reference

[1] Basic Calorie Calculator. (n.d.). Retrieved from <https://vet.osu.edu/vmc/companion/our-services/nutrition-support-service/basic-calorie-calculator>

Appendix

Table 1: First 5 rows of dataset

date	weight_raisin_lbs	weight_simone_lbs	weight_gagne_lbs	rer_raisin	rer_simone	rer_gagne
2018-08-12	19.7500	10.875	10.6250	362.4703	231.6963	227.6899
2018-08-19	20.1875	11.125	10.7500	368.4758	235.6797	229.6960
2018-08-22	20.2500	11.250	10.8125	369.3311	237.6629	230.6969
2018-08-24	19.8125	11.250	11.0625	363.3302	237.6629	234.6859
2018-08-27	19.3750	10.500	10.3750	357.2962	225.6779	223.6599

Table 2: Descriptive Statistics

date	weight_raisin_lbs	weight_simone_lbs	weight_gagne_lbs	rer_raisin	rer_simone	rer_gagne
Min. :2018-08-12	Min. : 7.938	Min. : 9.125	Min. : 8.00	Min. :183.0	Min. :203.1	Min. :184.0
1st Qu.:2018-10-28	1st Qu.:17.812	1st Qu.:10.125	1st Qu.:10.09	1st Qu.:335.5	1st Qu.:219.6	1st Qu.:219.1
Median :2019-03-21	Median :18.062	Median :10.375	Median :10.56	Median :339.0	Median :223.7	Median :226.7
Mean :2019-05-06	Mean :18.199	Mean :10.375	Mean :10.29	Mean :340.8	Mean :223.6	Mean :222.2
3rd Qu.:2019-10-22	3rd Qu.:18.500	3rd Qu.:10.562	3rd Qu.:10.75	3rd Qu.:345.1	3rd Qu.:226.7	3rd Qu.:229.7
Max. :2020-06-13	Max. :20.250	Max. :11.250	Max. :11.12	Max. :369.3	Max. :237.7	Max. :235.7
NA	NA's :3	NA's :8	NA's :62	NA's :3	NA's :8	NA's :62

Figure 1. Distribution of each dog's weight

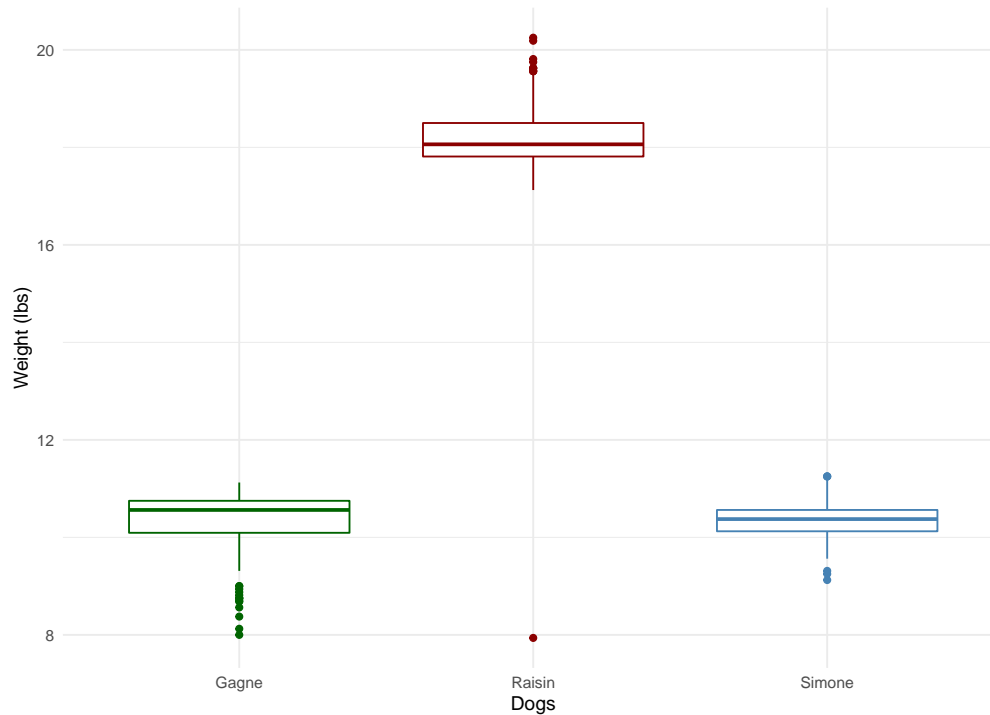


Figure 2. Dog weight measured from 2018-08-12 to 2020-06-13



Figure 3. Resting Energy Requirement measured from 2018-08-12 to 2020-06-13

