



Bringing it All Together: Storytelling and Application

NORTHEASTERN UNIVERSITY

ALY6070 COMMUNICATION AND VISUALIZATION FOR DATA ANALYTICS

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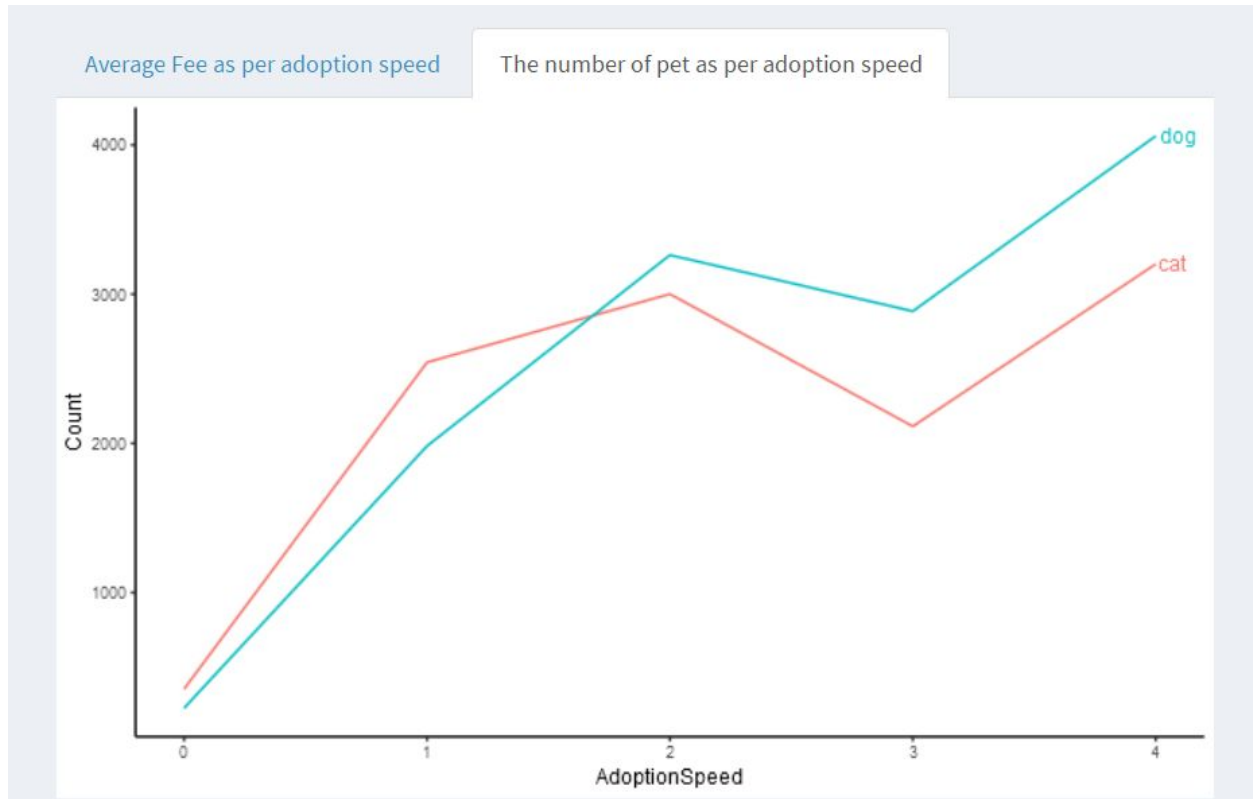
Introduction

Every year, around 1.2 million dogs are put down at shelters across the U.S. There are about 13,600 community animal shelters across the U.S. managing intake of about 7.6 million pets every year. And how many animals actually leave the system in that span? Around 2.7 million. We are provided with data of a similar type of shelter in the US. We will try to find out possibilities to increase the adoption rate of the shelter, in order to provide a home to a maximum number of pets. We will analyze the variables provided in the data to find out a solution for the pets.

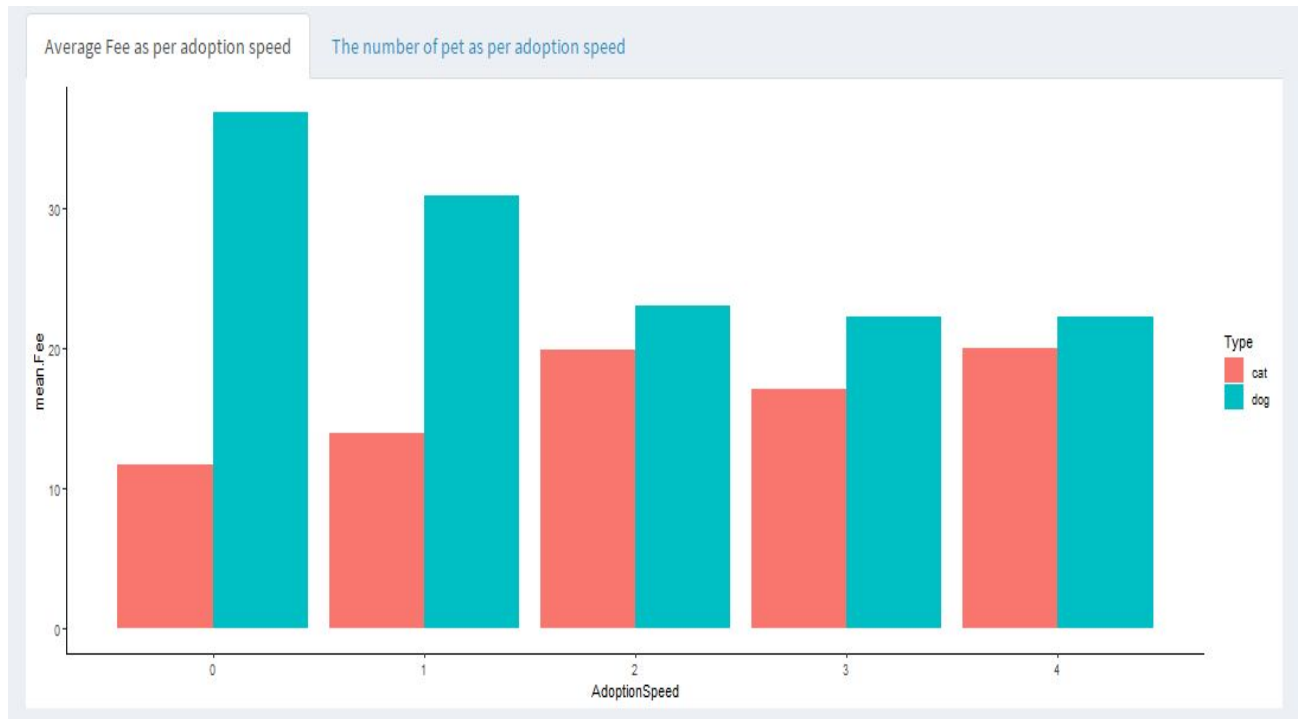
This project is based on the data collected from 14,993 pet adoption cases in Malaysia with 24 factors recorded from each case. By using some variables such as the type of pet, vaccinated, dewormed and sterilized conditions, the adoption fee, the number of pet and the adoption speed, we will determine the relationships between these factors. By the end of this project, we aim to find out which variables affect the pet adoption process in order to increase the adoption speed in the future.

Analysis

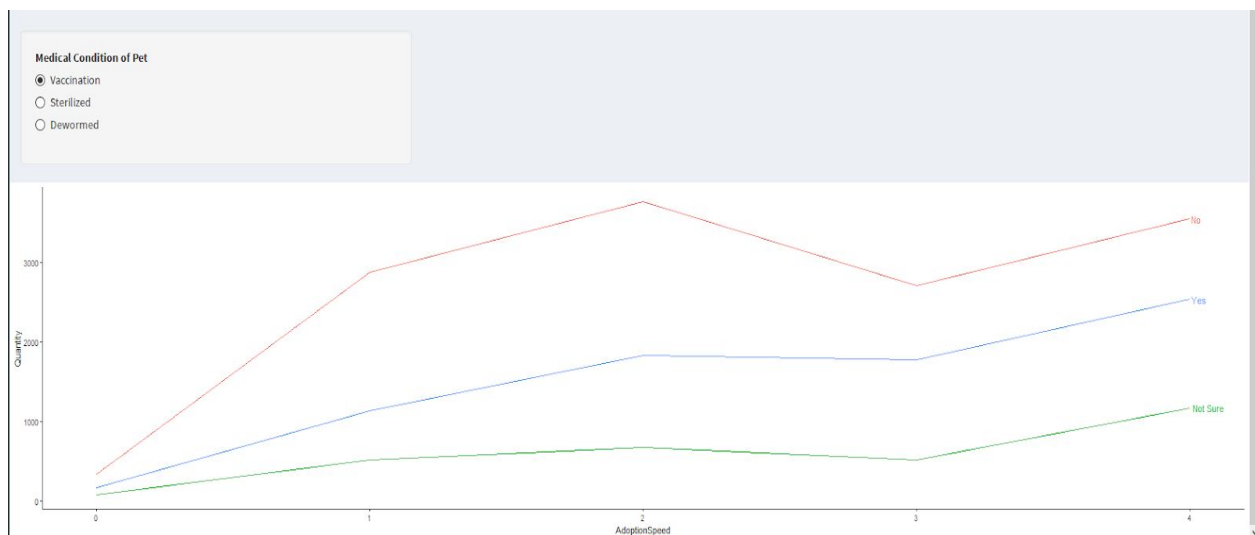
We wanted to analyze which pet was adopted more in the pet shelter from the day it was listed in the shelter, we found out that the adoption of dogs increased as the number of days passed in the shelter.



In order to understand the adoption fees for pets such as dogs and cats, we calculated the average of fees compared to the adoption speed in order to understand which type of pet is adopted more between a dog and a cat. The graph is shown below.

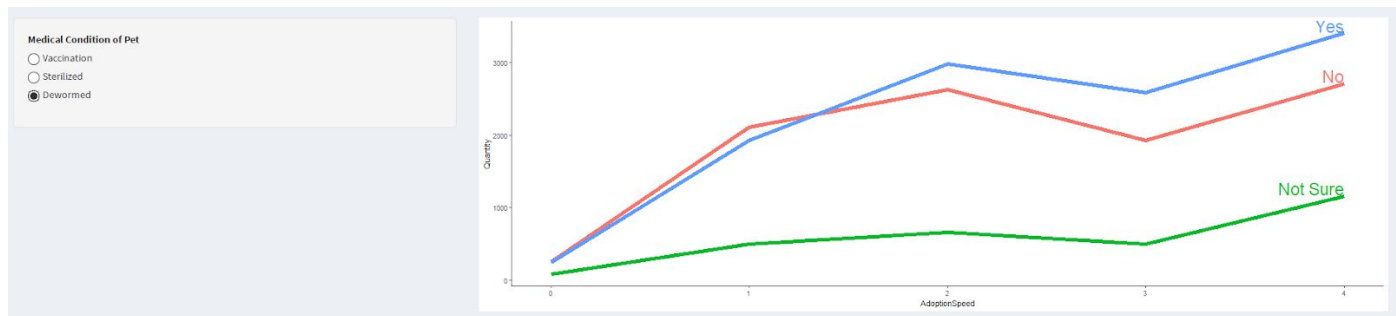


Next, we tried to find out if vaccinating pets played any part in the adoption rates, so we compared the number of pets in relation to the adoption speed condition is that the pets are vaccinated. The graph is shown below:

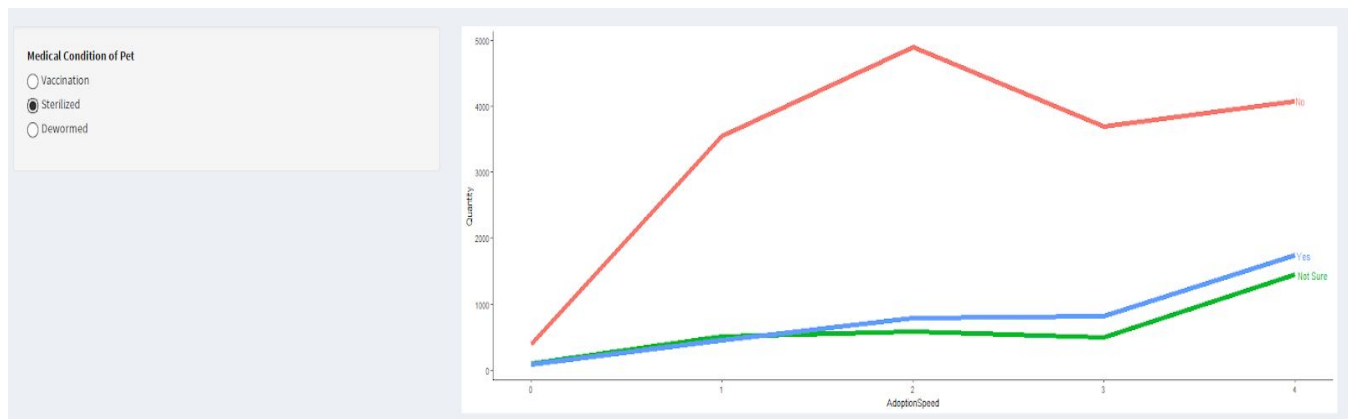


We were amused as of why would people adopt pets that are not vaccinated, but later we considered the fact that this has to be related to the age of the pets. Very young puppies/kittens who are 100 days old can get adopted without vaccination as some vaccinations for pets require the pets to be of a certain age.

Again we analyzed the fact that whether deworming the pets affected the rate of adoption, we observed that there was not any significant difference in the number of pets being adopted quickly, we considered the fact that possibility of pets being young can be a condition of them getting adopted quickly, but if the pets were old enough people were considering the fact whether the pets are dewormed or not. So the adoption quantity of dewormed pets was highest. The graph is shown below:

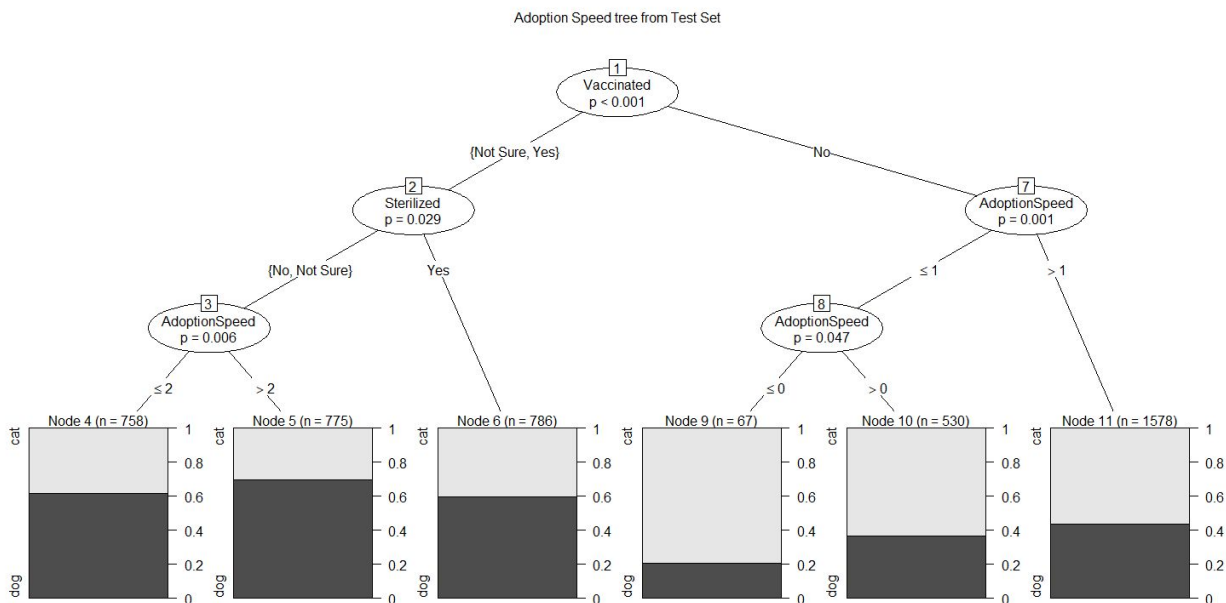
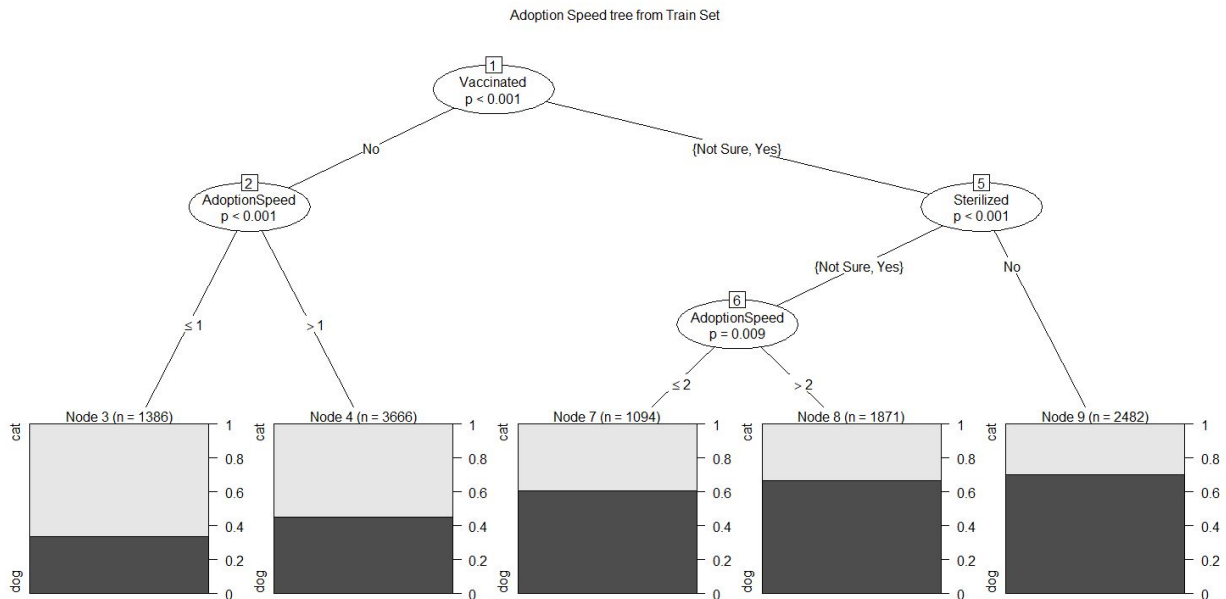


We also tried to analyze if sterilizing the pets affected the adoption speed, we found out that people who wanted to adopt the pets, they prefer their pets not sterilized. So sterilizing the pets would harm the chances of adoption of the pet. The graph is shown below:



Conditional Inference Tree

The variables that were used by our algorithm are categorical variables. First, it will divide the data set based on those variables, which has three possible outcomes, viz. the pet is vaccinated, the pet is not vaccinated, and the last one is that we are not sure.



If the pet is not vaccinated, then the tree moves to the next most important attribute that is adoption speed. Moving on from there, if the adoption speed is less than or equal to 1, then there is around 33% chance that it will be a dog and 67% chance that it will be a cat. Since more weight is given to a cat, it classifies this leaf node as a cat. Similarly, if the adoption speed is greater than 1 then also the probability of having a cat is higher than having a dog, hence if the pet is not vaccinated and whether or not the adoption speed is less than one, it classifies it like a cat.

If however, the pet is vaccinated or if we are not sure that the tree moves to towards the right direction. It then looks into another variable called the sterilized. If the pet is not sterilized than node 9 has a probability of around 70% being a dog, which classifies it like a dog. On the other hand, if we are not sure if the pet is sterilized or know for sure that it is sterilized than again in node 8 and 7 it classify it as a dog because a dog has a higher probability.

References:

1/ Shiny Dashboard. (n.d.). Retrieved March 21, 2019, from https://rstudio.github.io/shinydashboard/get_started.html

2/ Amr. (2018, March 22). Build your first web app dashboard using Shiny and R. Retrieved March 21, 2019, from <https://medium.freecodecamp.org/build-your-first-web-app-dashboard-using-shiny-and-r-ec433c9f3f6c>

3/ Vaccination Recommendations – Practice and Shelter-Housed Dogs. (n.d.). Retrieved from https://www.aaha.org/guidelines/canine_vaccination_guidelines/faq_practice_and_shelter.aspx