Predicting Adoptable Dogs' Time Spent in Shelters

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The Problem

Every year, nearly half of all dogs in shelters will go unadopted

Animal shelters are often underfunded and over capacity

Unadopted dogs put strain on shelters

Image source

The Idea

Develop a model to predict how long a dog will spend at the shelter

This will help:

- Shelters better advertise long-haul dogs
- Plan resource needs and available space for incoming dogs

The Data

- Data are from the Austin Animal Center (AAC) in Austin, TX

- This is the largest no-kill shelter in the US

- Includes ~7 years worth of intake and outcome data for each animal

Image source

What are we working with?

- 16,008 total adopted dogs
- ~1,400 unique breeds
  - Most dogs are listed as "mix" or a combination of two breeds
- 285 unique color combinations (one or two colors per dog)
- Intake condition and intake type
- Age
- Sex (including if they are nuetured or spayed)
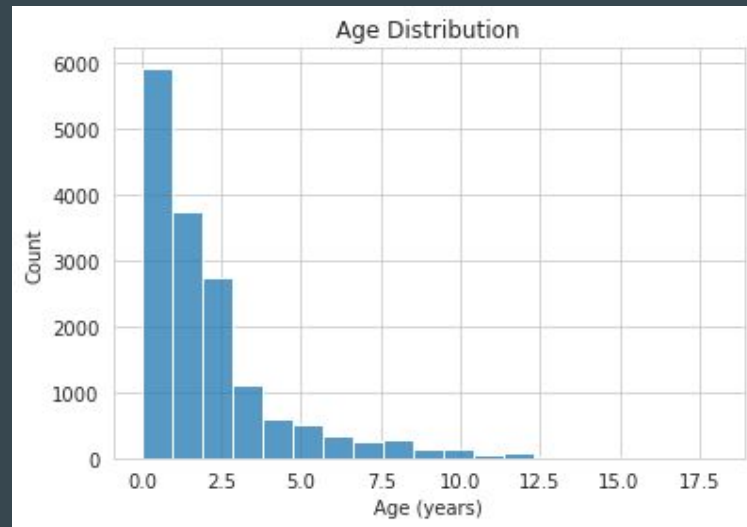- Time spent in the shelter

Exploratory Data Analysis

~50% of all dogs who are adopted from AAC spend less than 7 days in the shelter
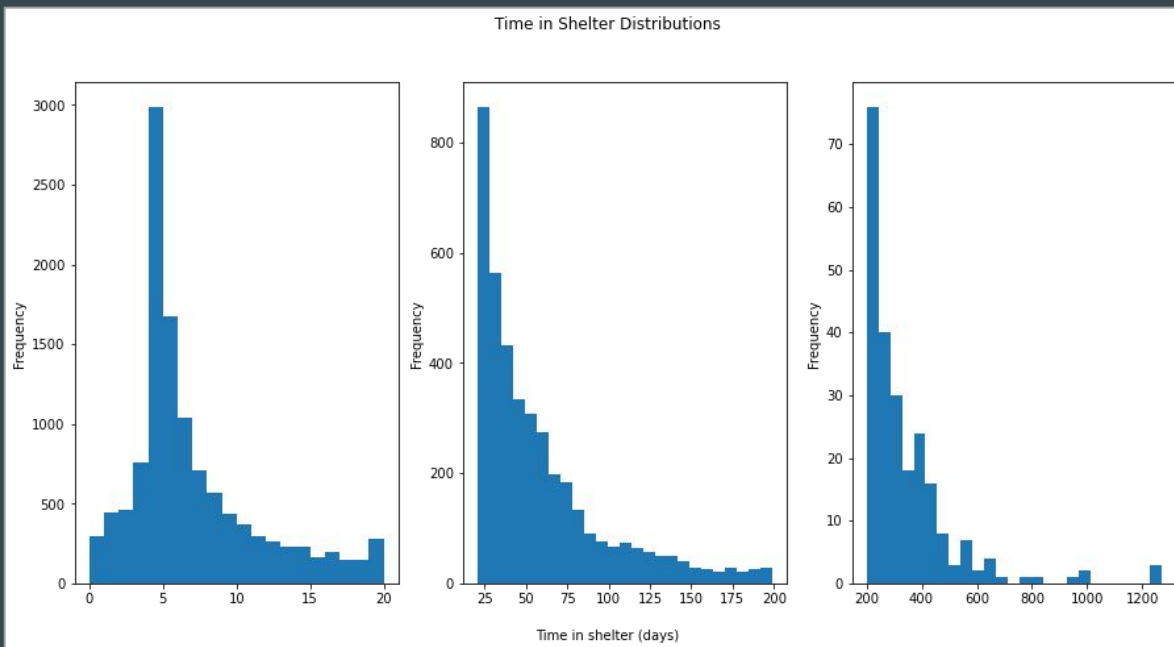
More EDA

Most dogs are under 3 years old

The Model

- After much trial and error, a random forest model run without color data performed the best.
- Color added too much noise (likely because it is so correlated with breed)
- Age is one of the most important features (people like puppies!)

Feature Importance
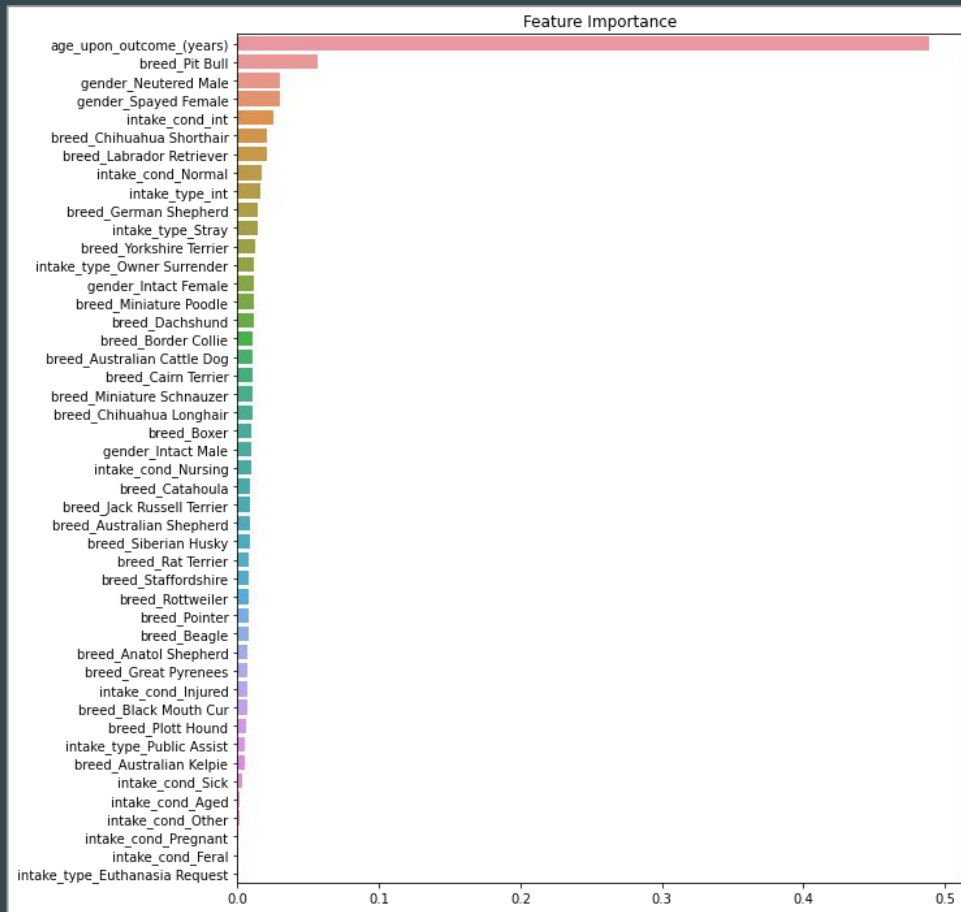
Useage

- Implement this model as a baseline predictor
- This should be used in conjunction with the expertise of experienced shelter staff in predicting adoption rates
- Improves the existing system of judging which dogs need more advertising

Future Improvements

- More data!
  - Dog size
  - Temperament
  - Training level (house trained? good on a leash?)
  - Is the dog socialized?

Image source