AUSTIN ANIMAL CENTER ADOPTIONS

By datAnimal

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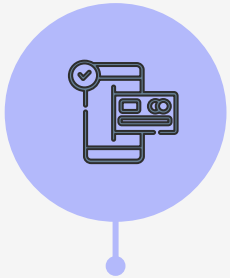

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INTRODUCTION

Austin Animal Center is a no kill shelter that provides care and shelter to about 16,000 animals annually.

All types of animals are taken in regardless of age, health, species, or breed. Their goal is to place all adoptable animals in forever homes.

The Austin Animal Center provides intakes and outcomes data on all their animals through the austintexas.gov site.

PROBLEM STATEMENT

We will predict whether an animal will be adopted or not based on the animal's intake information.

This information will help the Austin Animal Center understand which pets are likely to be adopted upon intake and better plan for capacity at the shelter.

We will evaluate our model's predictive effectiveness on the accuracy scores for each intake type.

DATA PRE-PROCESSING

DATA CLEANING

Clean intakes and outcomes datasets for usability on age, dates, breeds, and colors.

FEATURE ENGINEERING

Add historical data on animal's previous visits to shelter and extract info on if named, neutered, is mix, days in shelter, and dates.

JOINING DATASETS

Create key based on animal ID and date to join intakes and outcomes datasets.

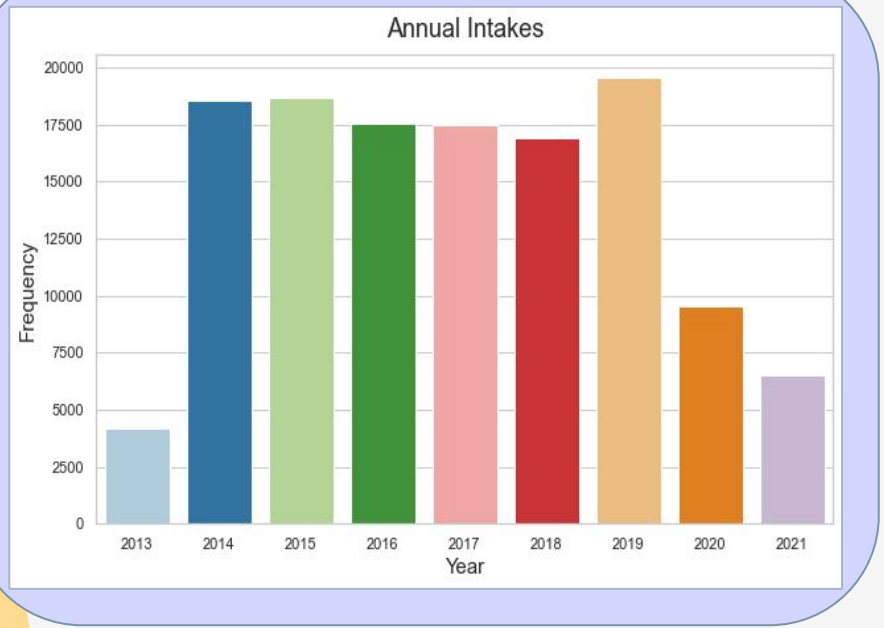
FOR MODELING

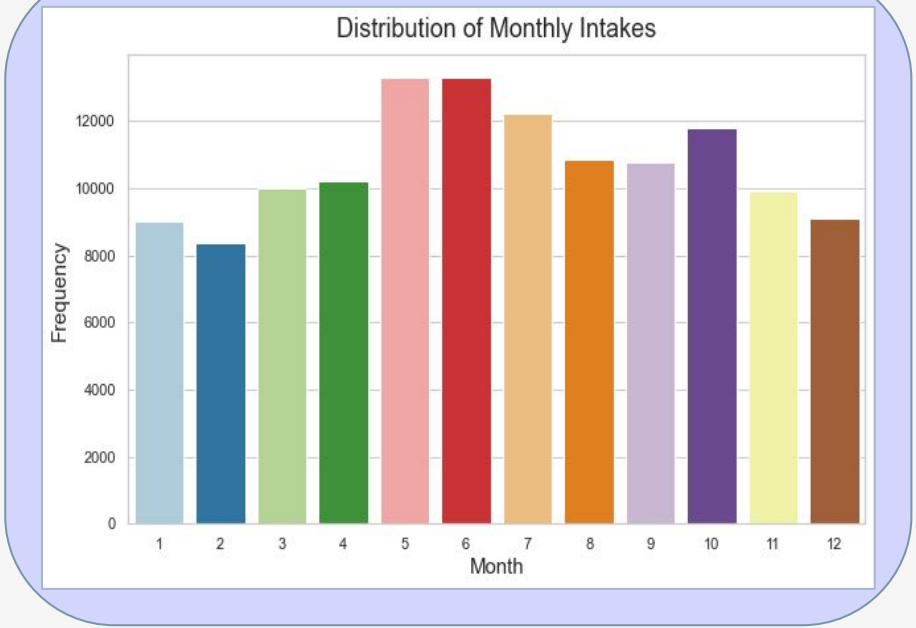
Change to binary classification, one hot encode categorical variables, and create separate dataframe for each intake type.

AUSTIN ANIMAL CENTER

EDA: INTAKES

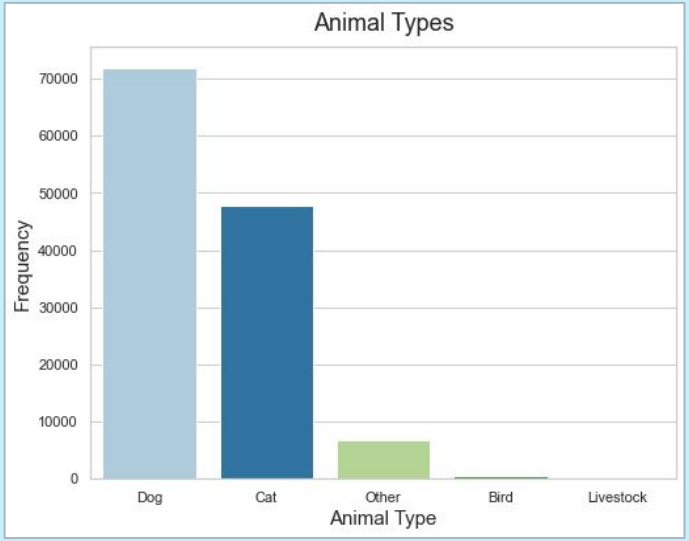
When are the animals arriving to the shelter?

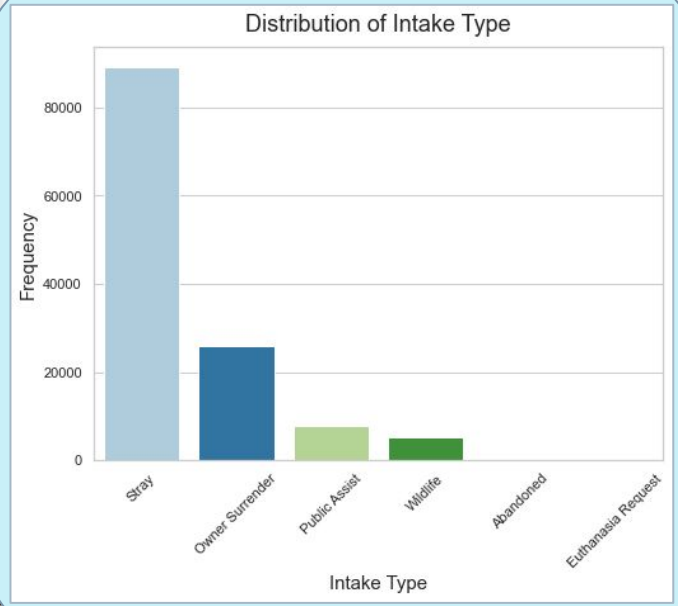




EDA: ANIMAL TYPES

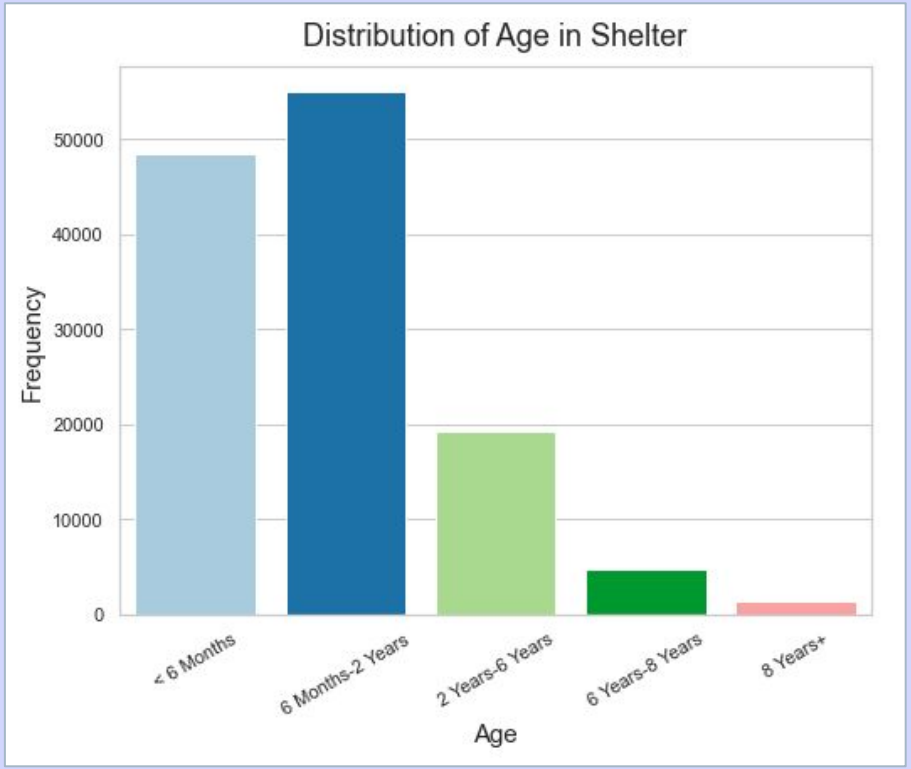
What types of animals are in the shelter? How were they brought in?





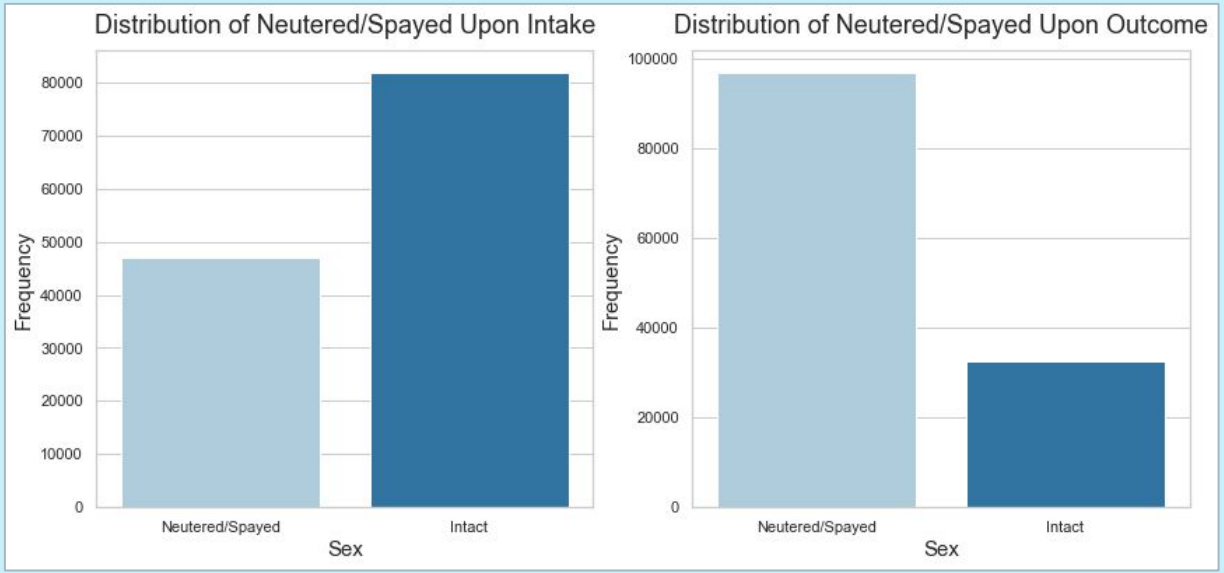
EDA: ANIMAL AGE

What are the ages of the animals in the shelter?



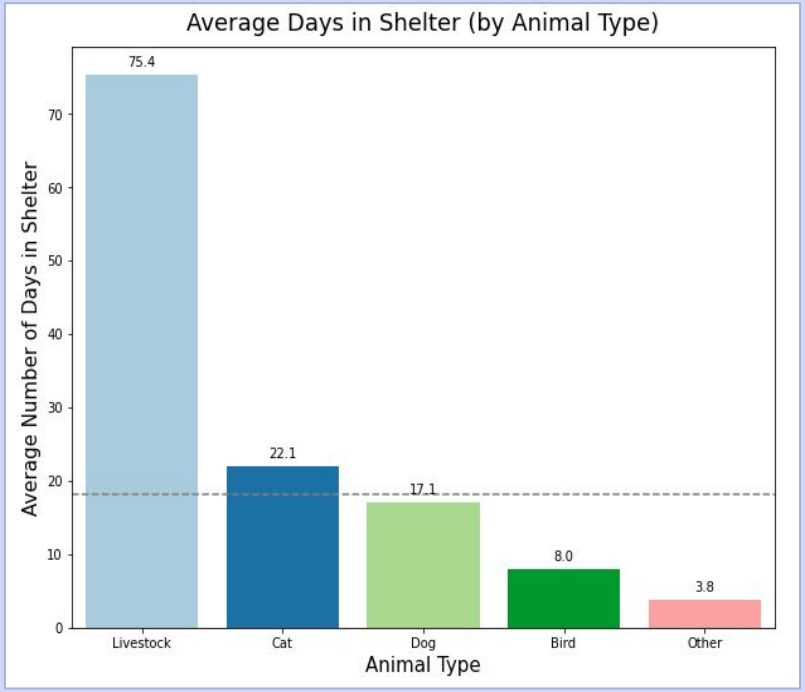
EDA: SPAYED/NEUTERED

The Austin Animal Center does a great job of neutering and spaying animals upon intake.



EDA: DAYS IN SHELTER

On average, how long are animals staying in the shelter?



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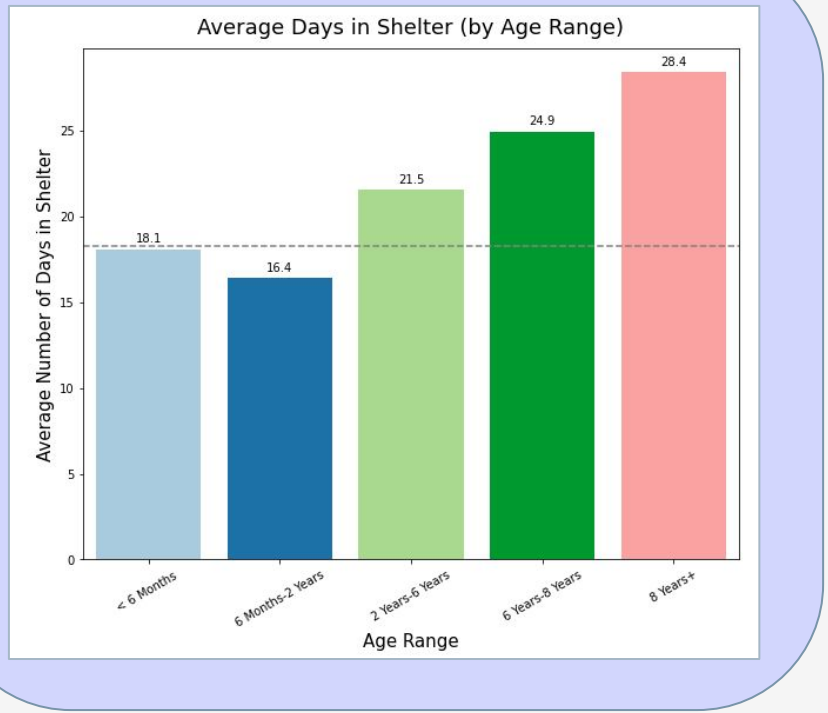
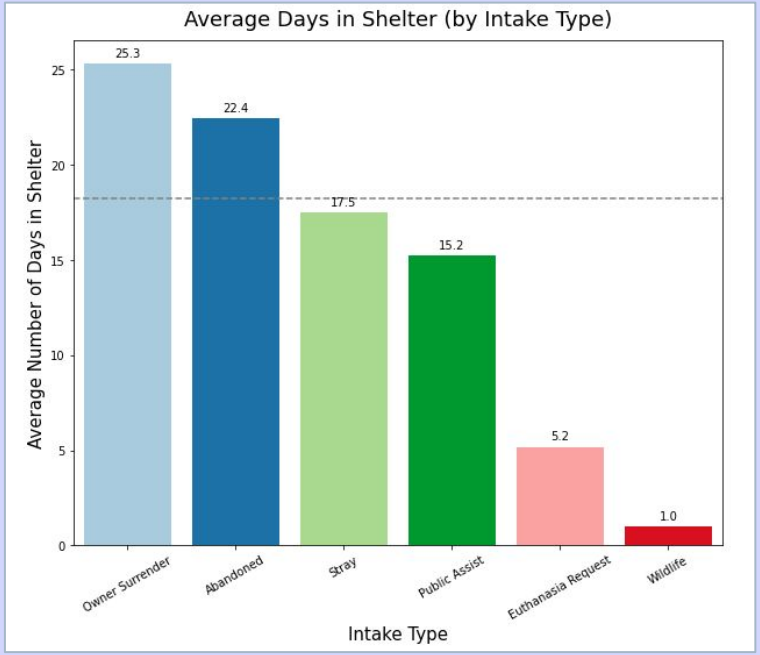
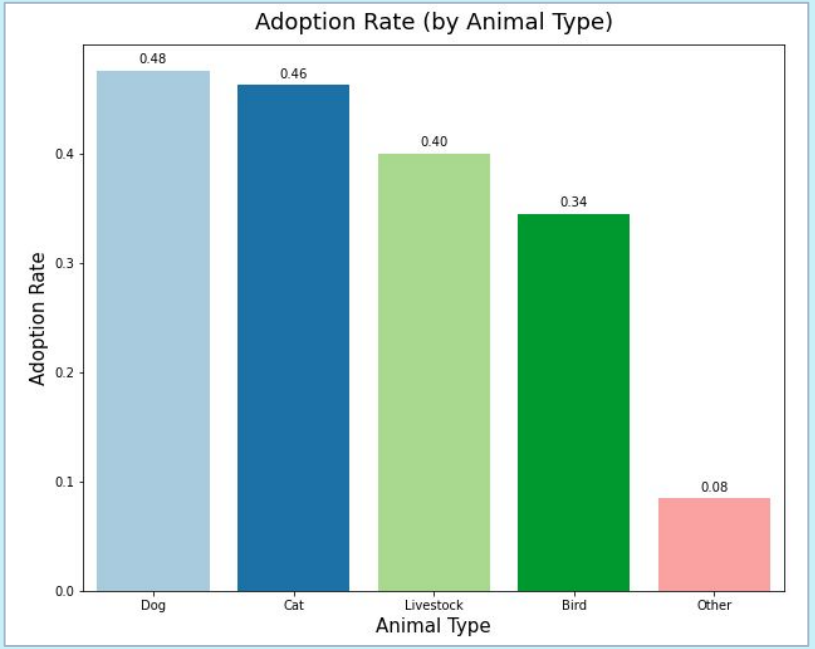




EDA: ADOPTION RATES

What is the adoption rate for the animals in the shelter?



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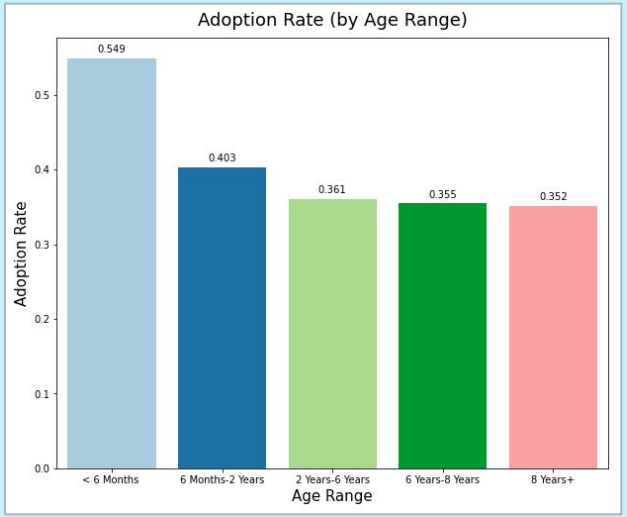
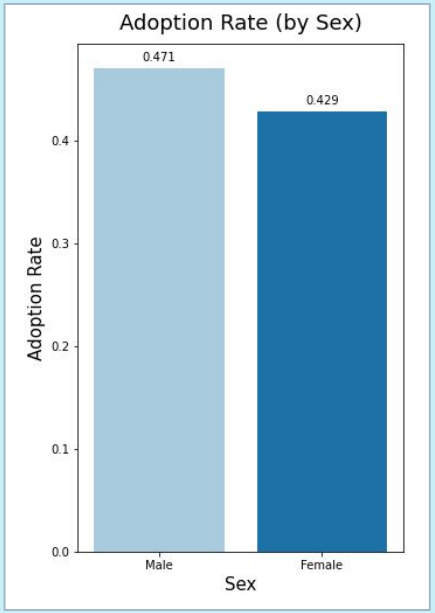
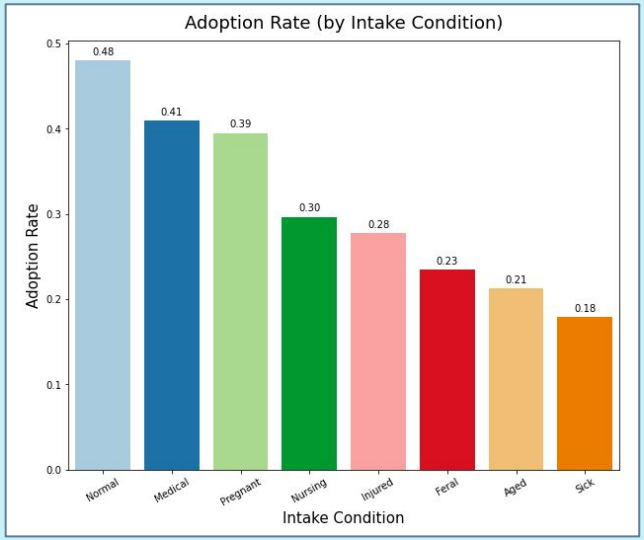
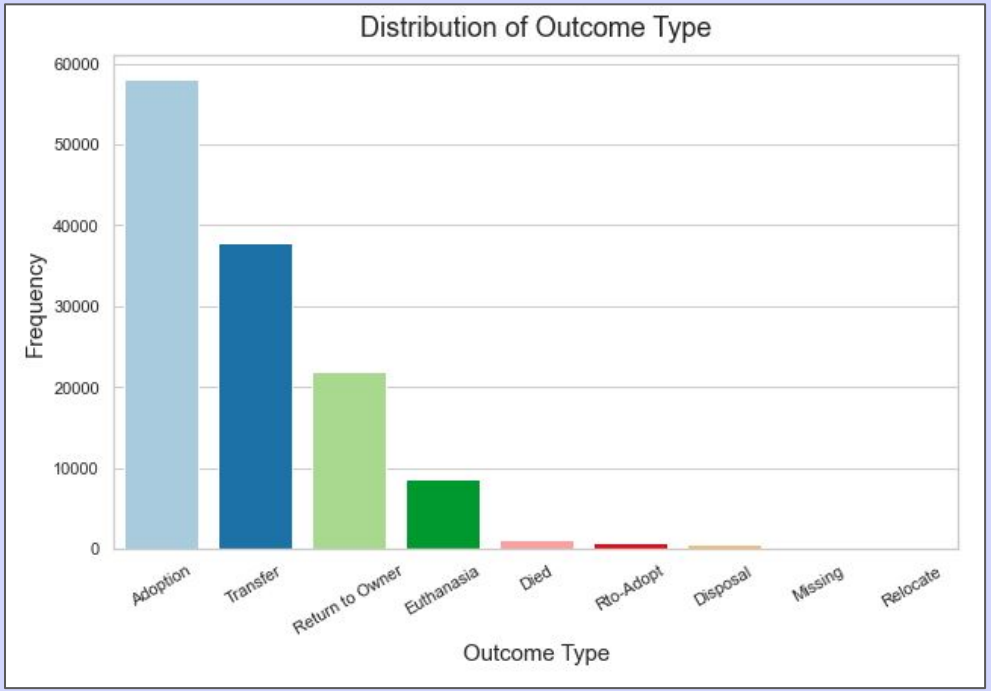






EDA: OUTCOMES ♡

What happens to the animals after the shelter?



MODELING PROCESS

MULTI-CLASSIFICATION

Fit models to predict all outcome options

REGRESSION

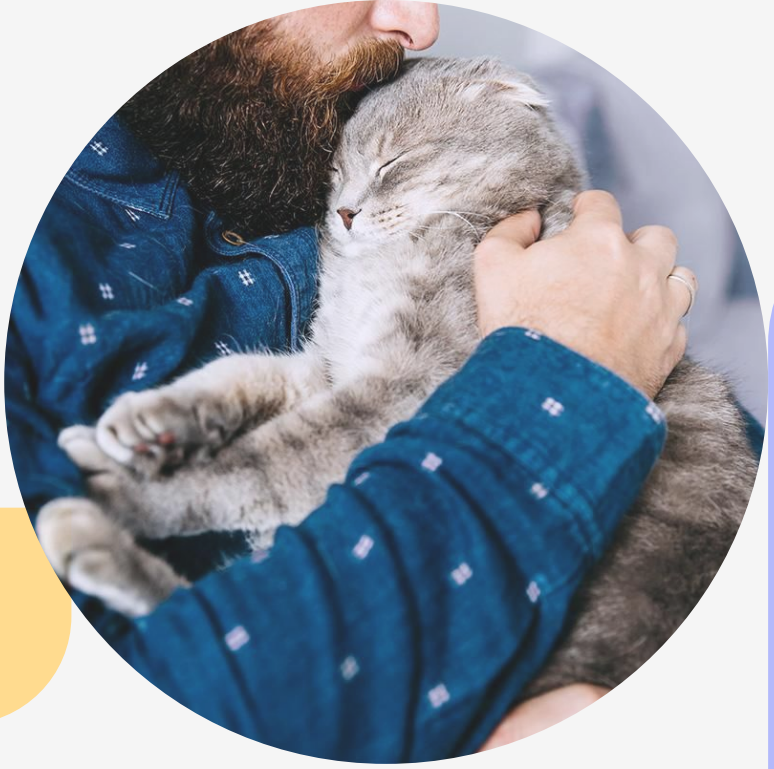
Fit models to predict amount of time animal would be in shelter

BINARY CLASSIFICATION

Fit models to predict if adopted or not

TRAIN ON EACH INTAKE TYPE

Trained binary classification model on intake type dataframe



PRODUCTION MODEL

We selected binary classification as the optimal model to use to help predict outcomes at the animal shelter. This type of model predicted the most accurate results and we believe the adoption prediction is the most valuable metric.

Out of all classification models fit, the Gradient Boosting Classifier was consistently chosen for each intake type model. This is because the accuracy scores were the highest and most consistent between training and testing data in each group.

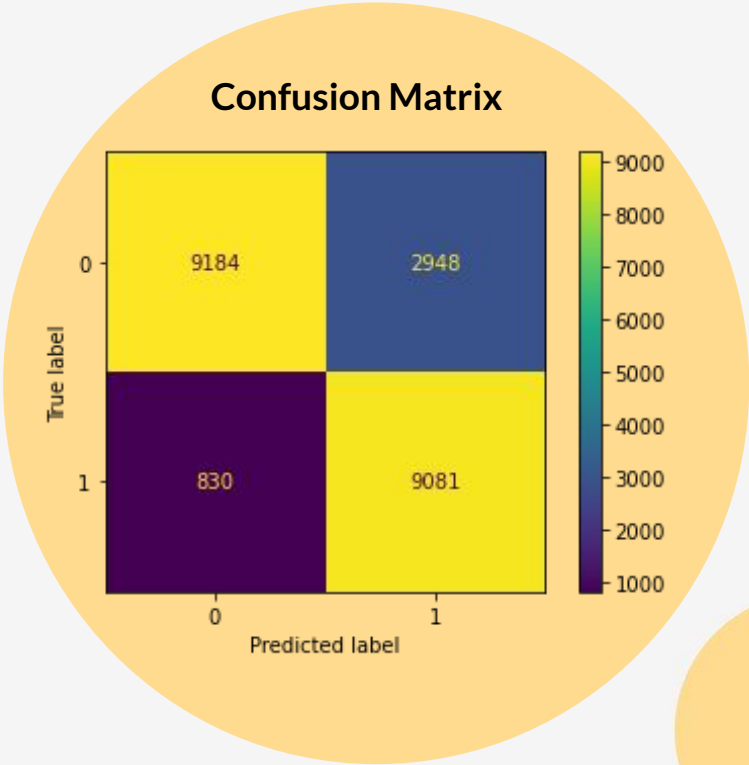
They hyperparameters were then tuned for each intake type GBC model.

PRODUCTION MODEL EVALUATION

MODEL TYPE	BASELINE SCORE	TRAINING SCORE	TESTING SCORE
Stray	55%	83%	83%
Owner Surrender	63%	74%	73%
Public Assist	85%	91%	90%
Abandoned	50%	87%	83%
Euthanasia Requests	95%	100%	95%
Wildlife	99%	100%	99%

MODEL FINDINGS: STRAY MODEL

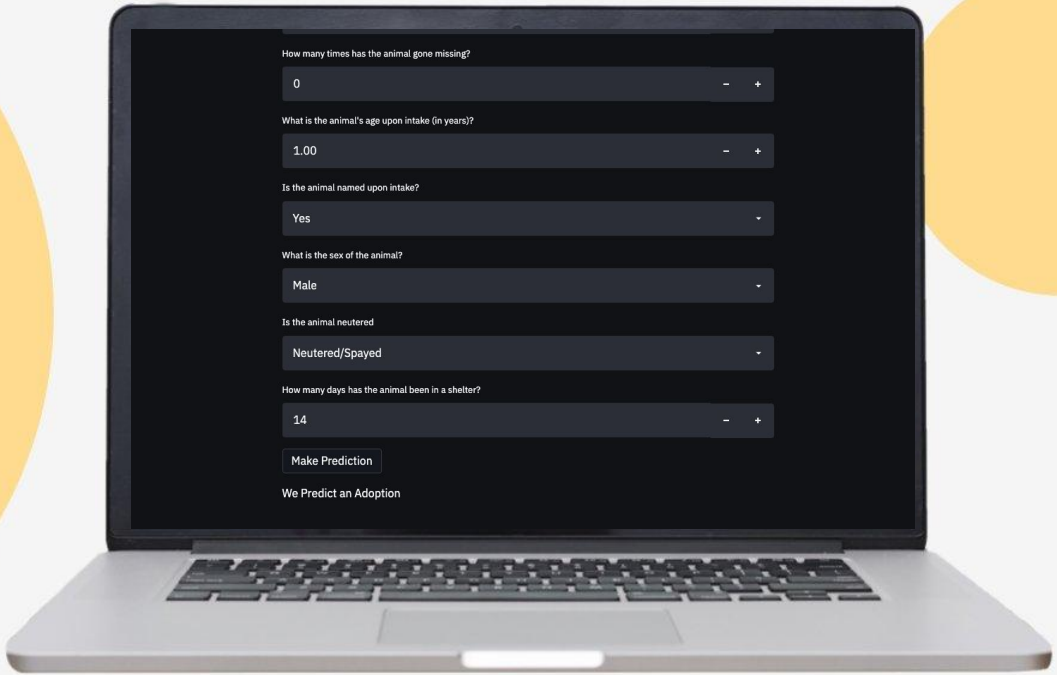
Feature	Feature Importance
days_in_shelter	0.835807
age_upon_intake	0.081602
animal_type_Cat	0.025108
is_named_in	0.014161
intake_condition_Normal	0.012038
animal_type_Dog	0.010166
is_neutered_Neutered/ Spayed	0.004267
age_type_< 6 Months	0.002986
breed_pit bull mix	0.002458
is_neutered_Intact	0.001768



STREAMLIT APP

The Austin Animal Center can use datAnimal's app to input information on any animal in the shelter and generate a prediction on their adoption in a matter of seconds.

Let's take a look at the app on Streamlit.



CONCLUSION: RECOMMENDATIONS

Austin Animal Center can run our model with all of their intakes on a weekly basis to understand expected capacity at shelter and plan accordingly.

Austin Animal Center should keep up the great data collection work! Standardizing inputs such as age, DOB, breed, and color could help make the information even more accurate and usable in the future.

CONCLUSION

There are limitations to our predictive model when looking at the intake type. This model may not make sense to use on wildlife or euthanasia intakes, as the chance of adoption is unlikely and the adoption prediction would not be as useful. Also, this model is specifically tailored to the Austin Animal Center and has not been tested for other shelter data this time.

Next steps for this project would be to work with Austin Animal Center to standardize data collection for inputs and collect more information on intakes on to keep improving the adoption predictor.

THANKS!

Questions?

REFERENCES

INTAKES DATA

https://data.austintexas.gov/Health-and-Community-Services/Austin-Animal-Center-Intakes/wter-evkm

AAC INFORMATION

https://www.austintexas.gov/content/austin-animal-center

OUTCOMES DATA

https://data.austintexas.gov/Health-and-Community-Services/Austin-Animal-Center-Outcomes/9t4d-g238

PRESENTATION TEMPLATE

SlidesGo