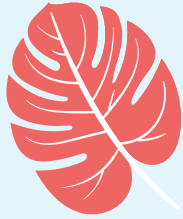


Petfinder: Bay Area Dog Adoption

Jessica Bow



Background



Dogs who spend extended periods in shelter are prone to behavioral challenges including:

- House-training regression
- Separation anxiety
- Excessive barking
- Destructiveness
- Fearfulness
- Food aggression

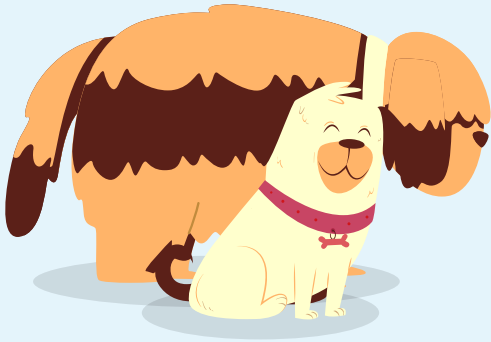


Problem Statement



I endeavor to infer the most influential features in predicting timely shelter dog adoption.

If we can better understand the features with the potential to reduce the amount of time a dog spends in rescue, we can reduce the strain on shelters and help dogs find their forever homes.



Overview

01

GENERAL DISTRIBUTIONS

Bay Area dog
demographics

02

MODELS + PERFORMANCE

Models, accuracy and
feature coefficients

03

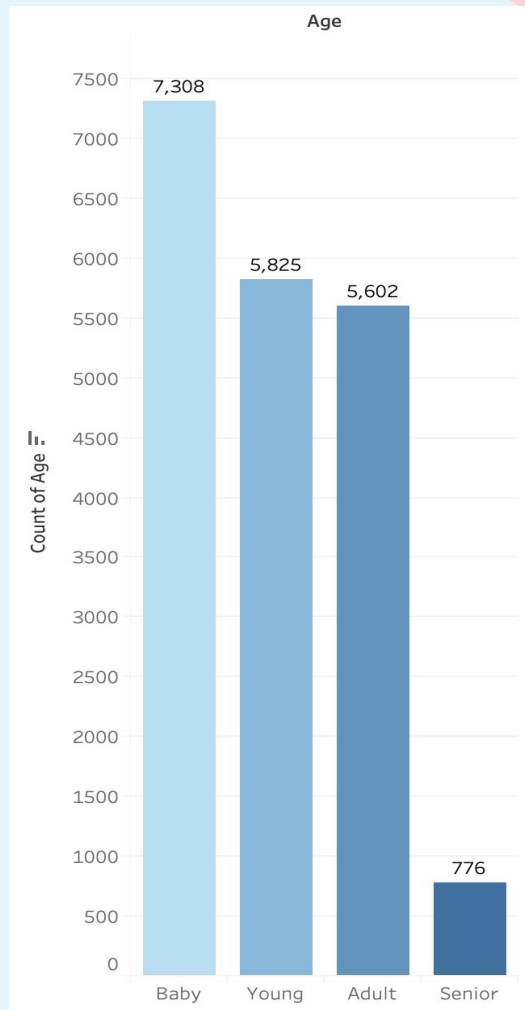
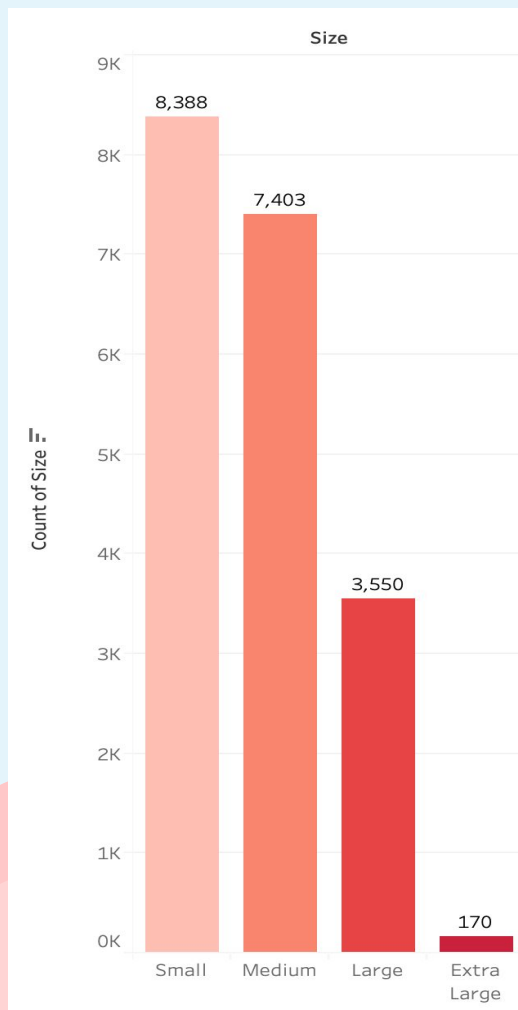
MISCLASSIFICATIONS

Misclassified listing
trends

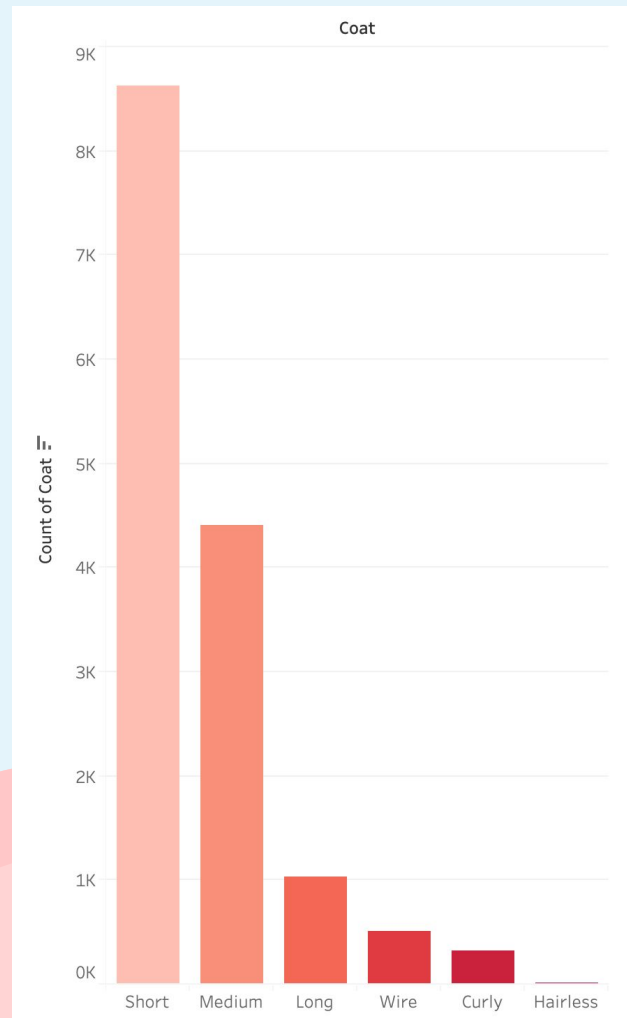
04

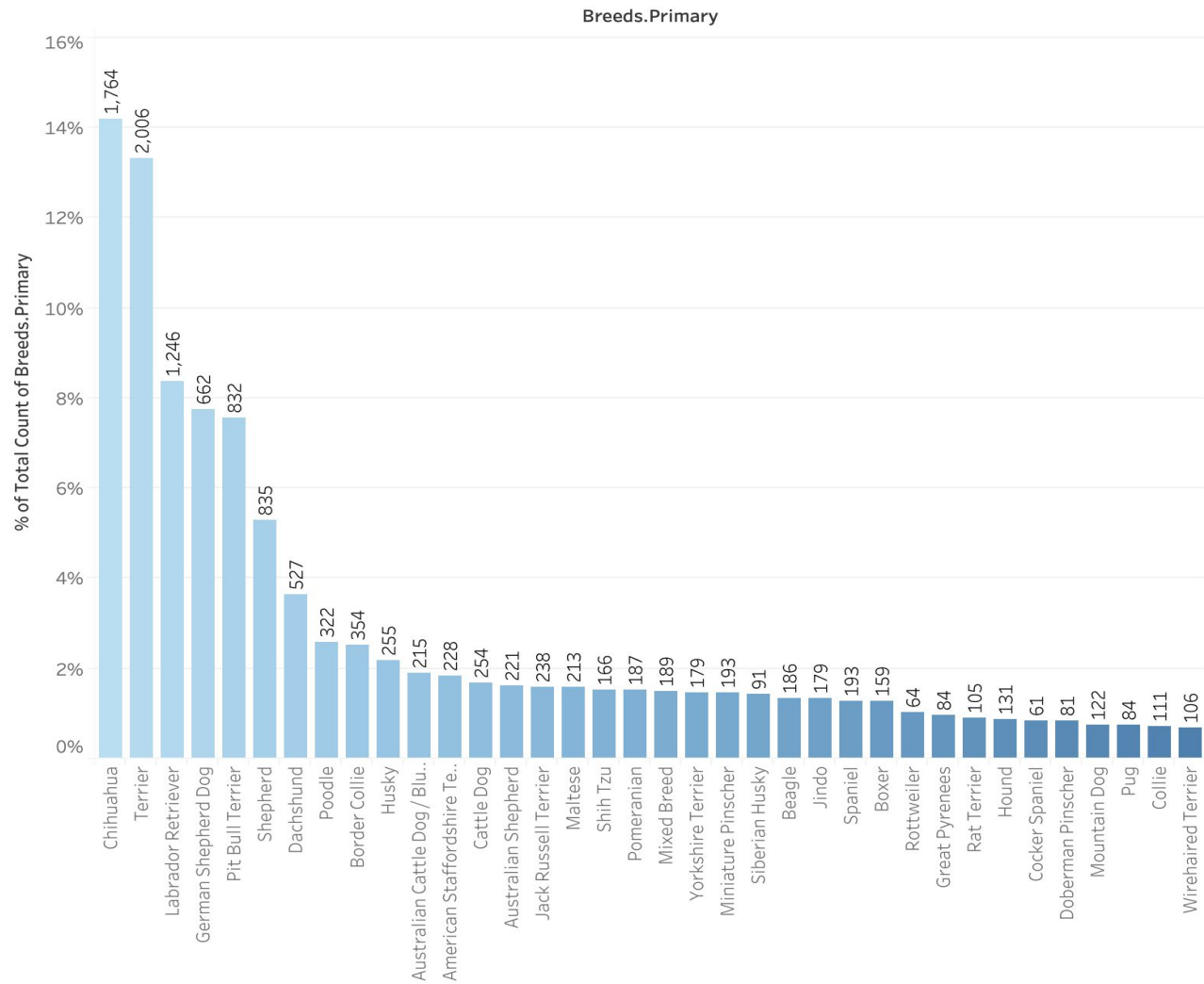
NEXT STEPS

Future improvements



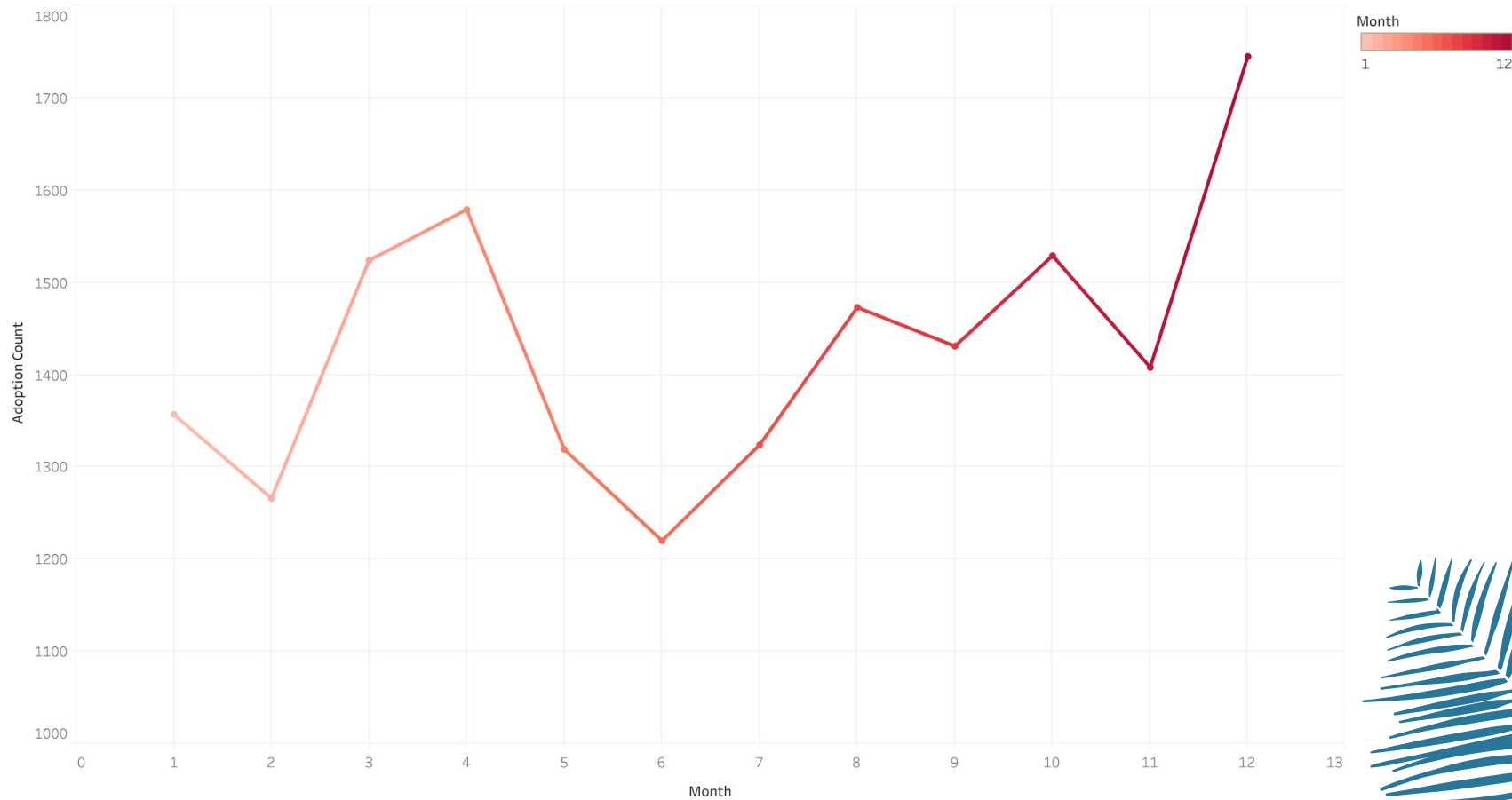
Coat Type





Primary Breed Distribution

Adoptions By Month



Days on Petfinder

Mendocino County
23.0

Colusa County
26.1

Yuba County
44.5

Sutter County
26.0

Placer County
67.0

El Dorado County
31.3

Sonoma County
24.3

Napa County
51.5

Yolo County
38.6

Sacramento County
42.6

Solano County
20.2

Calaveras County
18.7

Tuolumne County
61.4

Marin County
48.1

San Francisco County
28.5

San Joaquin County
48.3

Stanislaus County
26.4

San Mateo County
46.4

Santa Clara County
27.2

Merced County
14.3

San Benito County
22.5

Monterey County
46.2

MODELS

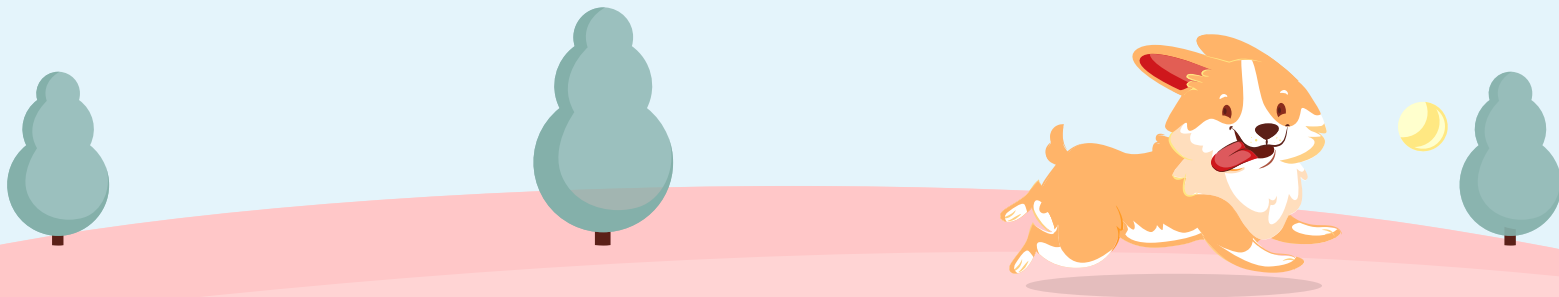
LOGISTIC
REGRESSION

BAGGING
CLASSIFIER

RANDOM
FOREST

ADABOOST

XG BOOST



Feature Union



Categorical data



LogReg

Numerical data

Train Score:
0.76

Baseline:
0.52

Test Score:
0.73

Feature Coefficients

FEATURES	COEFFICIENT
AGE - PUPPY	1.92
SIZE - SMALL	1.48
GOOD WITH KIDS	1.32
GOOD WITH CATS	1.40
SPECIAL NEEDS	0.48
AGE - SENIOR	0.55
BREED!	Terrier: 3.34 Dalmation: 0.20



Misclassified Dogs

ACTUAL	PREDICTED	COUNT	MISCLASSIFIED
SPEEDY ADOPTION	Speedy Adoption	2,305	No
SLOW ADOPTION	Slow Adoption	1,935	No
SPEEDY ADOPTION	Slow Adoption	794	Yes
SLOW ADOPTION	Speedy Adoption	820	Yes★

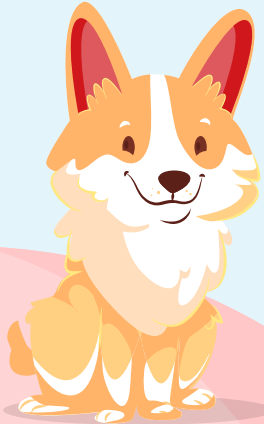
- ★ Investigating False Negatives can prove insightful for how struggling shelters can do better.

MISCLASSIFICATIONS

Positive Misclass-

1. Animal Friends Connection: 9.6%
2. Bella Vita Rescue: 9.6%
3. Love & Second Chances: 5.7%

*Description polarity score 2x as positive as negative misclass



Negative Misclass -

1. Dogwood Animal Rescue: 9.1%
2. Underdog Animal Rescue: 7.4%
3. Solano County SPCA: 6.8%



TAKEAWAYS

- Specify and spread out. By targeting a specific demographic of shelter dog in your area shelters can better support their dogs and make quicker matches with potential adopters.
- Transfer pets based on local demand
- Volunteer outreach and training
- More in depth application process
- Include details and unique mission statement on your Petfinder shelter page
- Seek sponsorship with local business/corporation
- Test and report if your shelter dogs are compatible with cats, children and other dogs
- See the bright side - end descriptions on a positive note!

SOURCES:

Maddie's Fund

NEXT...

- Pull corresponding images
- Continue tuning hyperparameters for models
- Try more models (SVM)
- Add in data prior to 2019
- Predict dogs still in shelter



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[GitHub](#)

[LinkedIn](#)

Thank you for your time.

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