Boosting Cat Adoptions:

Predicting Outcomes of Cats at the Austin Animal Center

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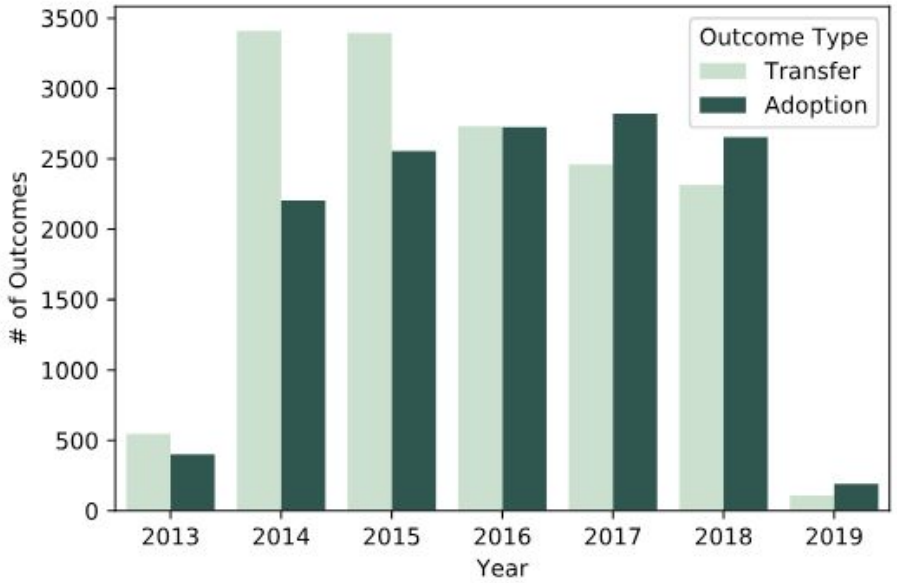
Cats in Shelters:
Yearly Totals, US

- 3.4 million cats brought to shelters
  - 1.4 million are euthanized
  - 1.3 million are adopted
  - 700k left in shelters

Austin Animal Center

- 2010 - “No Kill Implementation Plan”
- Largest no-kill shelter in the US
  - Accepts cats, dogs, birds, reptiles, and others

Adoptions and Transfers



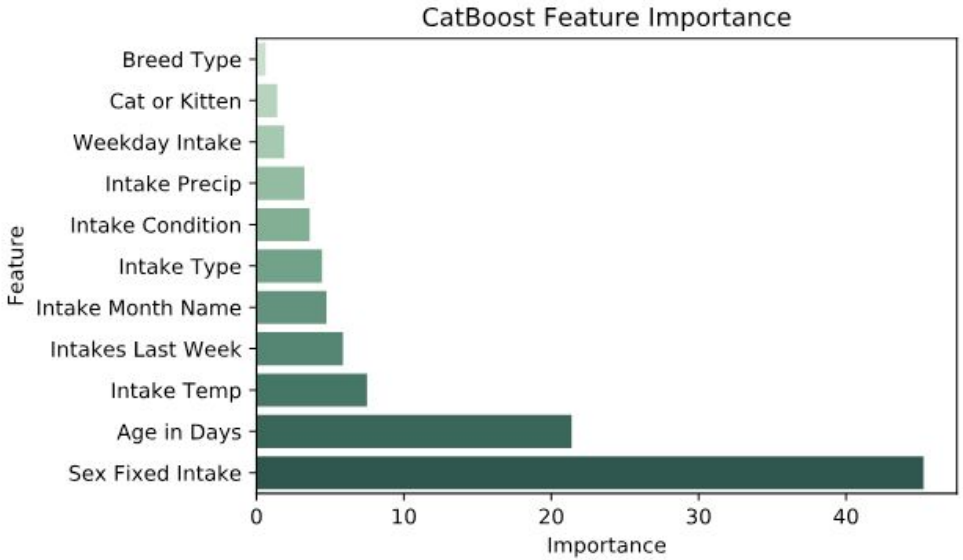
Cats: Oct 2013 - Present

Outcome	Adoption	Transfer
Total Outcomes	~13.5k	~15k
Median Stay	27 Days	2 Days

Goals and Methodology

- **Build a Model**
  Utilize intake and outcome data from Austin's data portal to train a classification model to predict outcomes
- **Gain insight**
  What attributes of an animal at intake are most important when predicting whether they will be transferred or adopted
- **Create a Flask App**
  Automate the process of figuring out where animals should be brought, instead of bringing them in and immediately transferring them

Winning Model - CatBoost Classifier



Metric	Score
Accuracy:	0.748
Precision:	0.771
Recall:	0.728

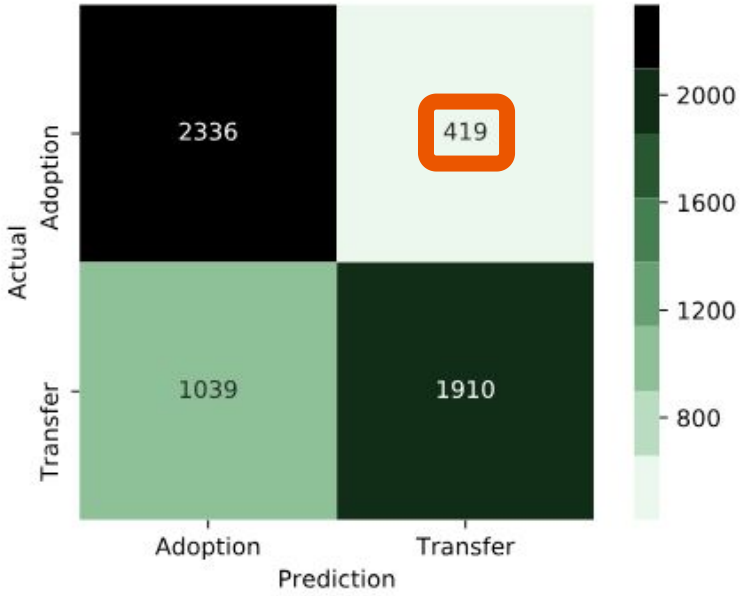
Confusion Matrix

0.5 Probability Threshold

Confusion Matrix

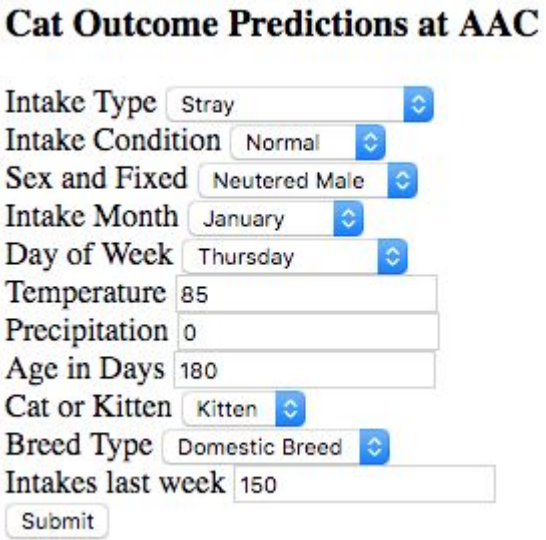
0.5 Probability Threshold

0.6 Probability Threshold



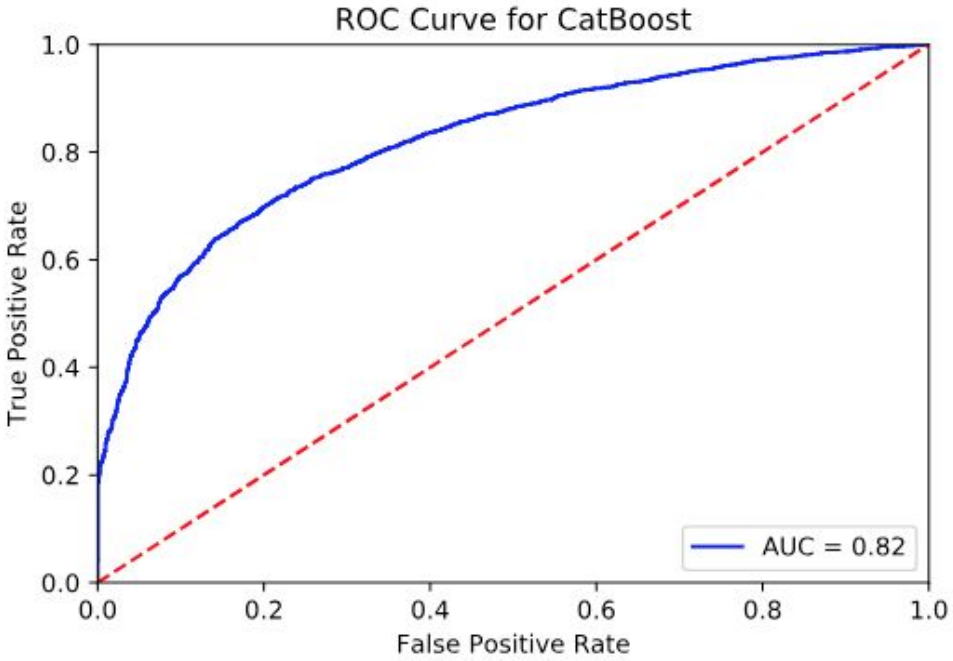
Future Work

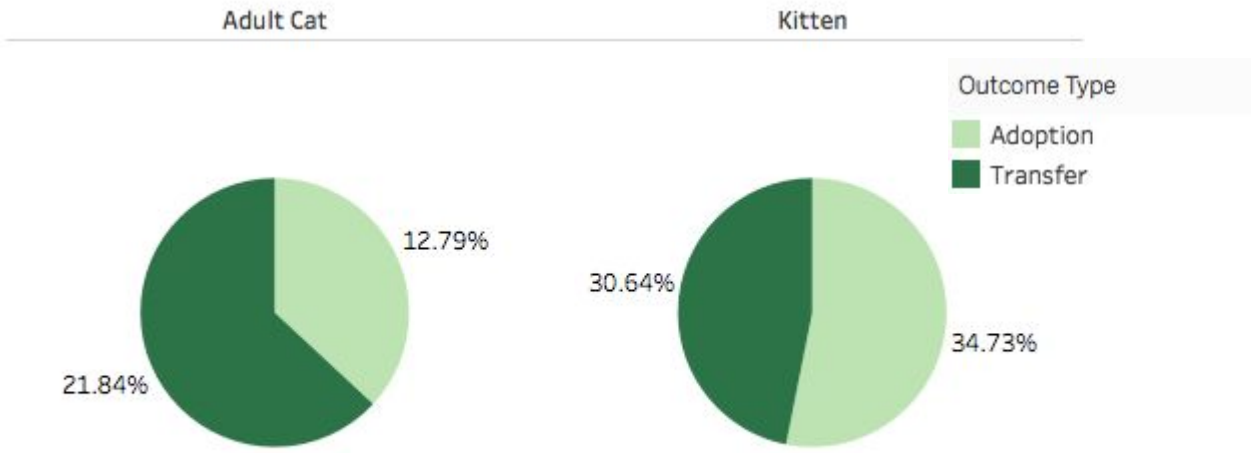
- Flask - work in progress
  - Some information would need to be automated / populated by shelter
- Add observations as more data comes in to further train model
- Utilize this project to make similar model for dogs, etc.

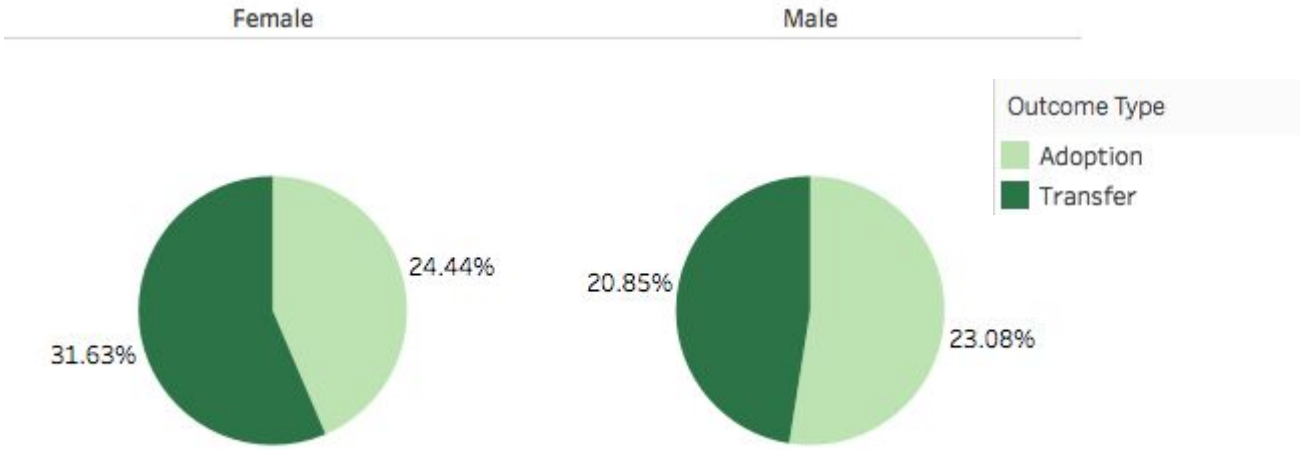


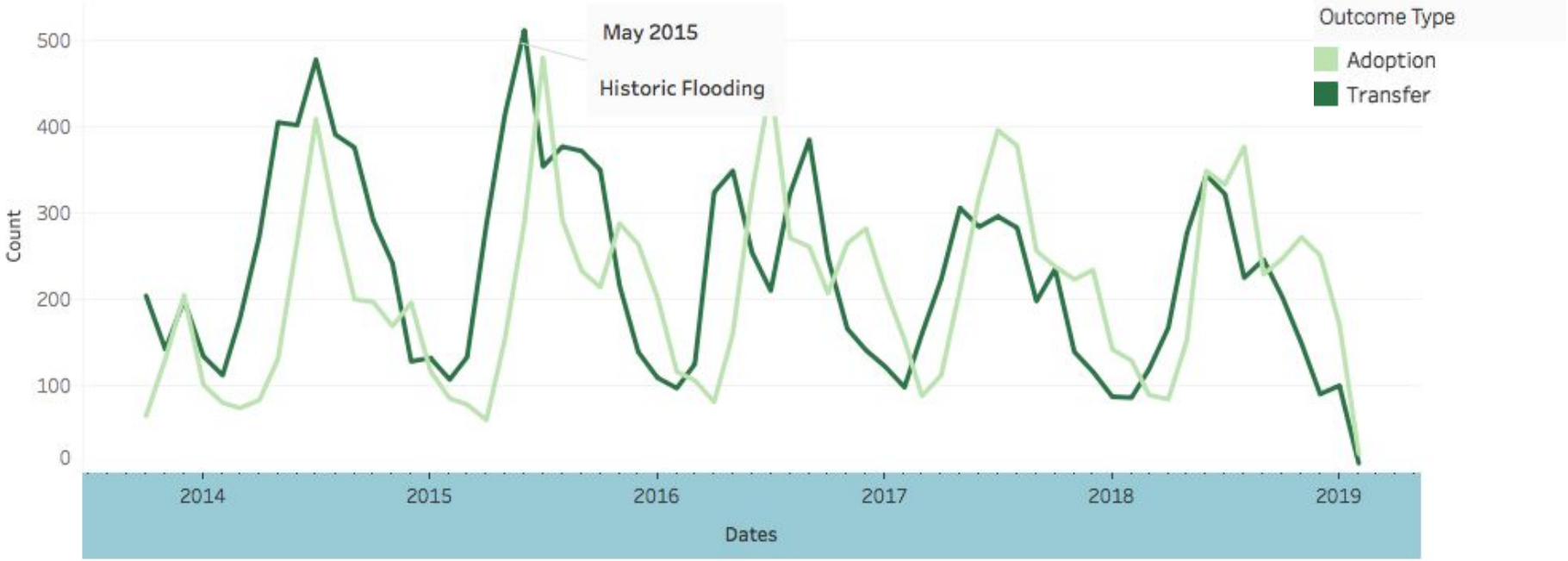
Thank you!

Appendix


ROC Curve for CatBoost
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
AUC = 0.82


Adult Cat
Kitten
Outcome Type
Adoption
Transfer
12.79%
21.84%
30.64%
34.73%


Female
Male
Outcome Type
Adoption
Transfer
24.44%
31.63%
20.85%
23.08%


May 2015
Historic Flooding
Outcome Type
Adoption
Transfer
Count
500
400
300
200
100
0
2014
2015
2016
2017
2018
2019
Dates