Prioritizing Shelter Animals for Adoption

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Optimizing Animal Shelters Adoption Outcome

Proposal: prioritize animals by their probability of getting adopted.

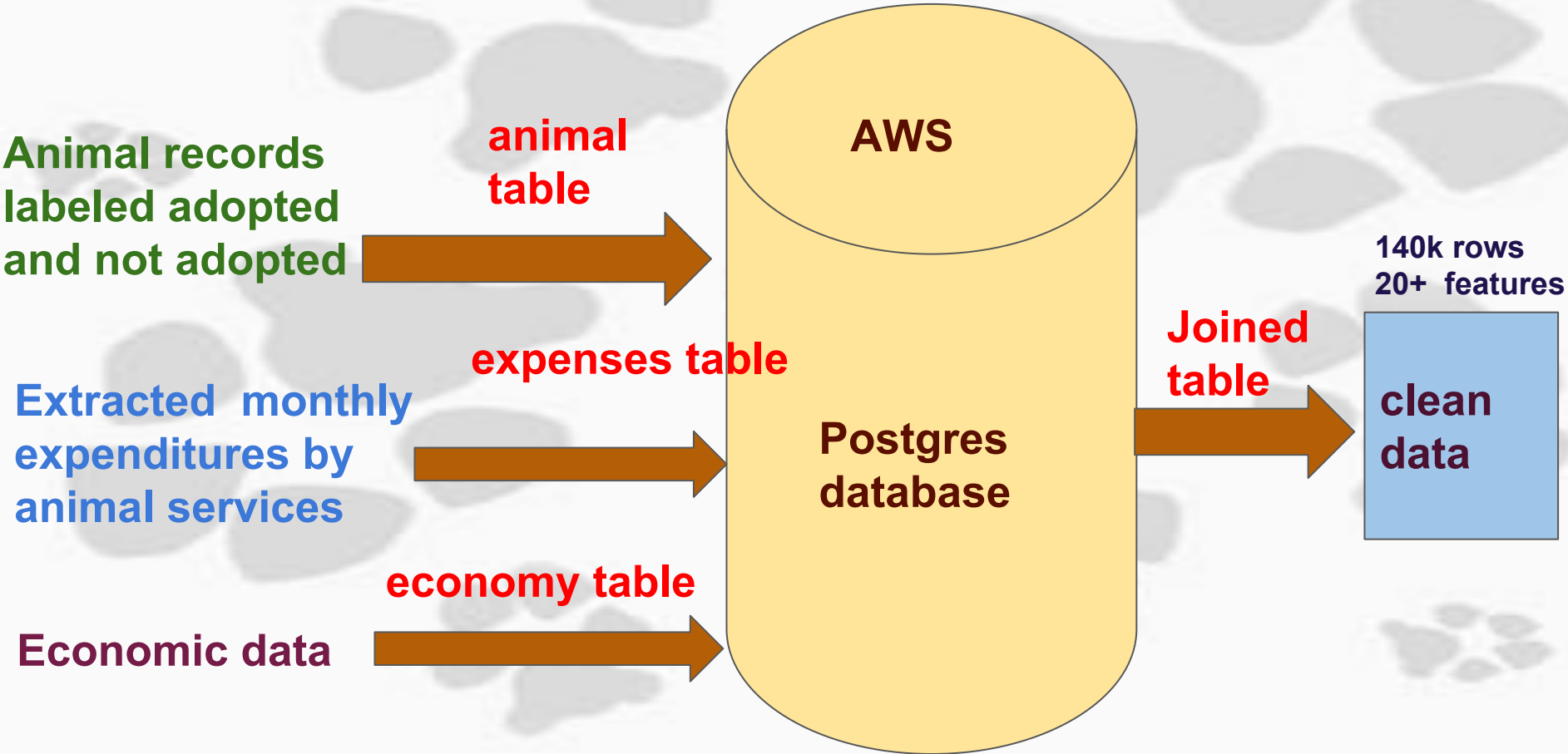
Data: Louisville, KY 2007-2017

DEPARTMENT OF ANIMAL SERVICES

OPEN DATA
data.louisvilleky.gov

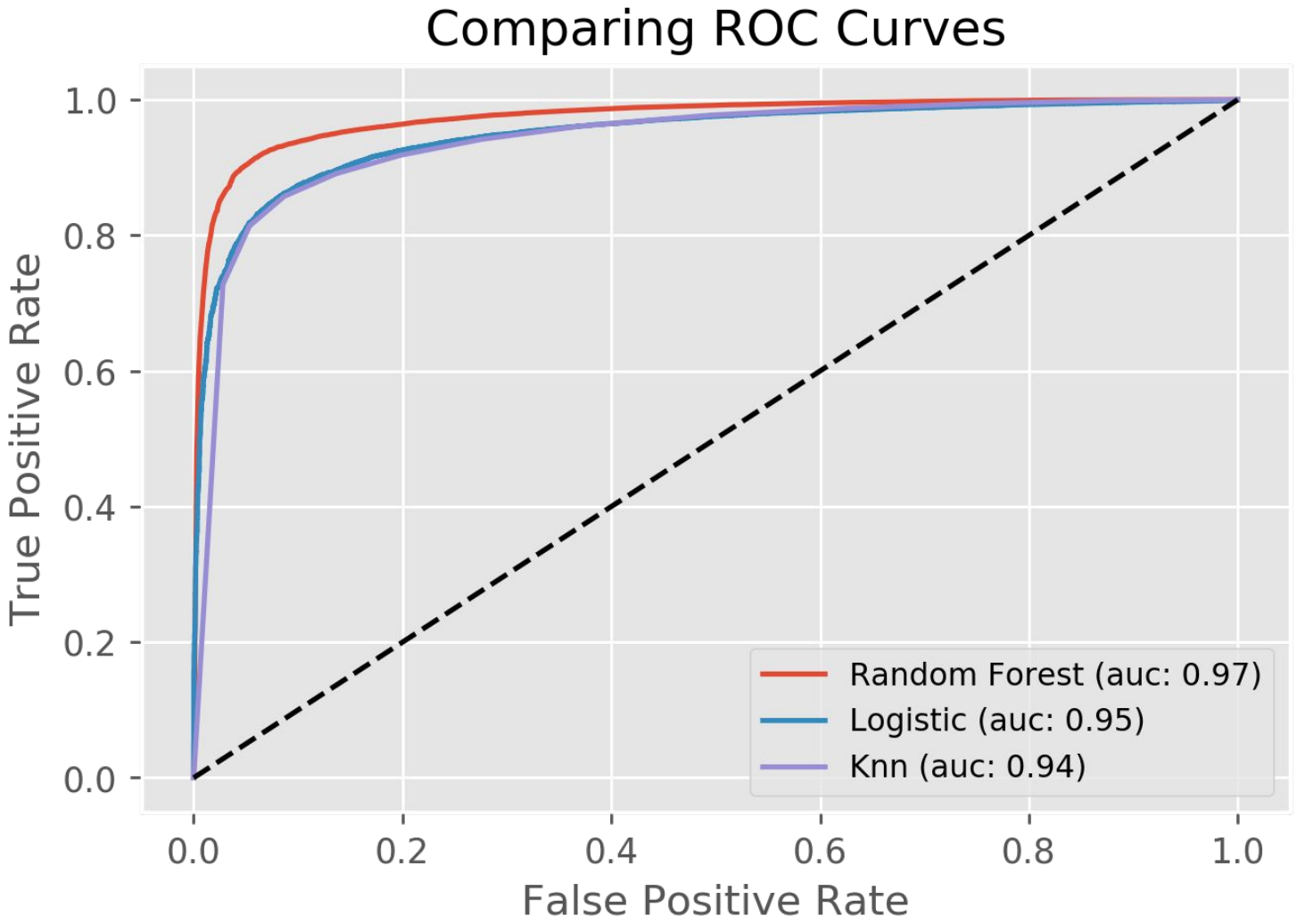
- Animal services intake and outcome
- Monthly government expenditures by
- Monthly economic index

Data Cleaning and Transformation

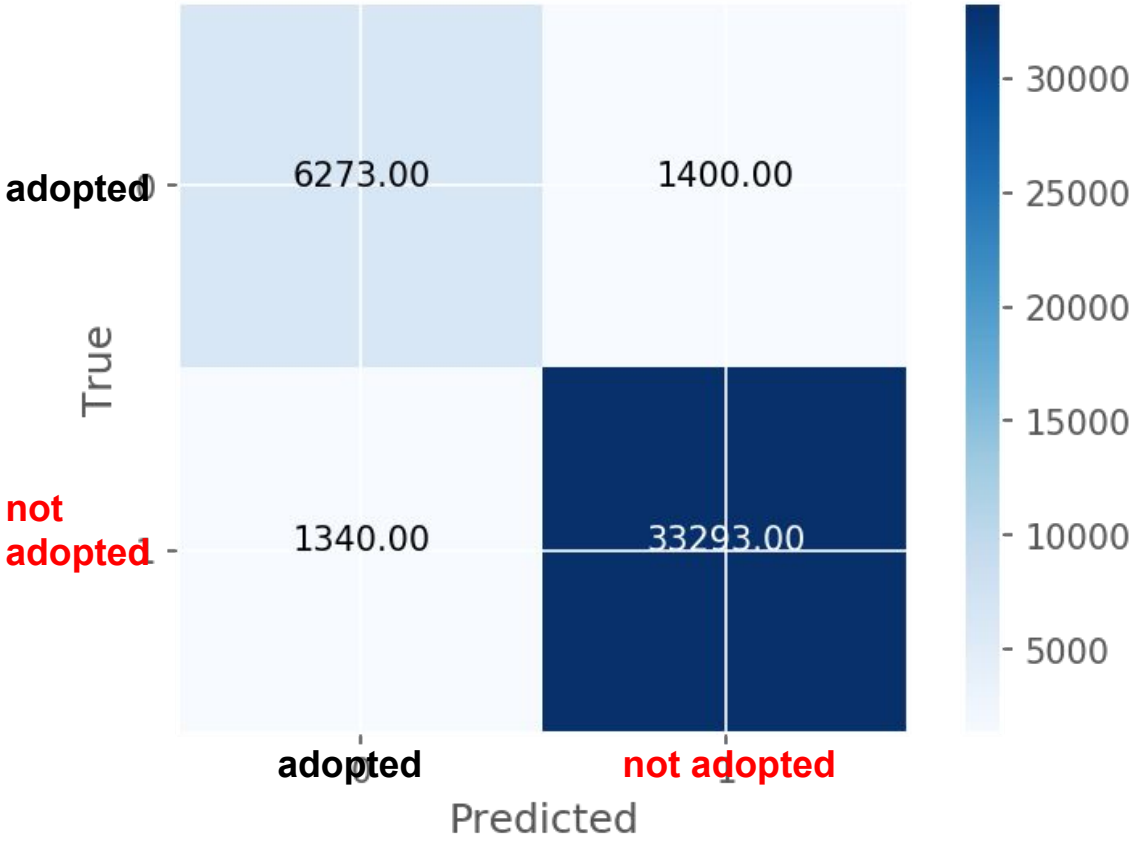


Model Selection

- Metrics: AUC and run time
- Candidates: KNN, SVC, GaussianNB, Random Forest, Decision Tree, Bagging,Logistic Regression
- Methods: cross validation score, random search cv, grid search cv
- Winner: Random Forest


Comparing ROC Curves
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
Random Forest (auc: 0.97)
Logistic (auc: 0.95)
Knn (auc: 0.94)

Random Forest Prediction Confusion Matrix



Let’s make some predictions!

Probability of animal adoption

Animal type dog ▾

Intake reproductive status fertile ▾

Outcome reproductive status altered ▾

Intake health unhealthy ▾

Outcome health healthy ▾

Submit

Probability of getting adopted:

0.3263157894736842

Let’s make some predictions!

Probability of animal adoption

Animal type cat

Intake reproductive status fertile

Outcome reproductive status fertile

Intake health healthy

Outcome health healthy

Submit

Probability of getting adopted:

0.28421052631578947

Main Takeaway

We wish all shelter animals could find a loving home. Sadly in reality the majority of them end up being euthanized.

With limited resources, the best we can do is

Prioritize animals by their probability of getting adopted to maximize the rate of adoption.

Future Steps

- Identify different animal demands by location; move animals to areas with higher demand for better chance of being adopted.
- Optimize resources on animals with highest increases in adoption probability with sterilization, medical treatments or behavioral therapy.

Thank you!

Questions?