

Group 31: Shelter Animal Outcomes

Indrani Sarkar, Letícia Torres Silva, Nweke Constance Ifeoma, Johann Hillmann

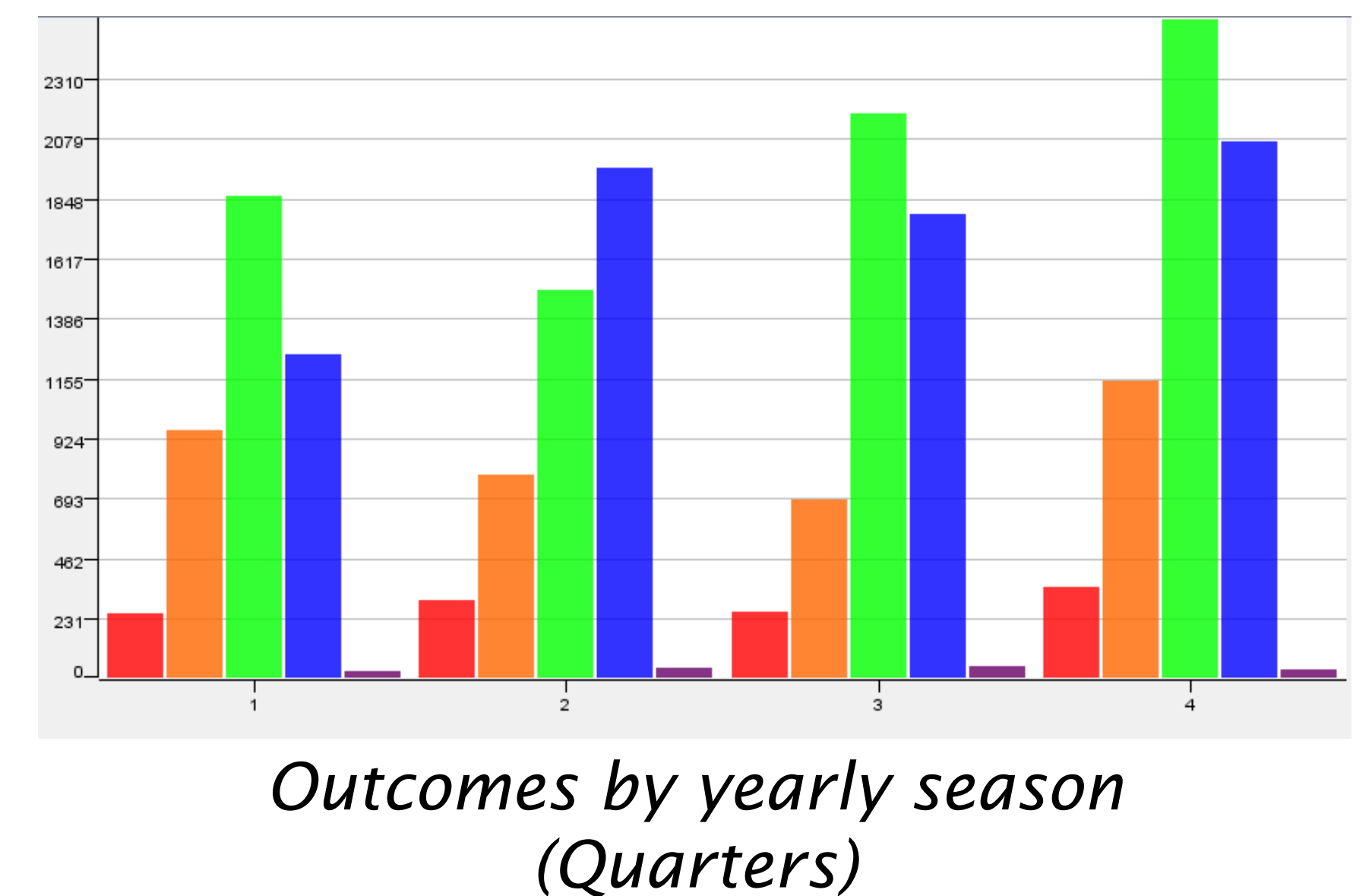
Challenge

Predict the Outcome of the animals as they leave the Animal Center.

Possible Outcomes:
Adoption, **Return to Owner**,
Transfer, **Euthanasia**, **Dead**

Original Dataset

- Animal Types: Cats and Dogs
- 26729 instances
- 9 features containing the characteristics of the animals and their outcomes after leaving the shelter
- 8 nominal (string format) and 1 interval (Date/time format)



Data Understanding

- 21322 missing values in the dataset taking together Name, OutcomeSubtype, SexuponOutcome, AgeuponOutcome features
- For SexuponOutcome feature, some values represented as "Unknown"
- OutcomeSubtype feature strongly correlated to the target feature

Data Preparation

Attributes Created:

- Age in months
- Quarters - date in periods
- Breed in Mix and not Mix
- Color in single color and normal

* missing values – remove row
(OutcomeSubtype: missings -> 'unspecified')

Attributes Selected:

- Animal Type
- SexuponOutcome
- Age in months
- Quarter
- Known Heritage

Modelling

Classification models applied:

- Decision Tree
- Random Forest**
- K Nearest Neighbor
- Naive Bayes

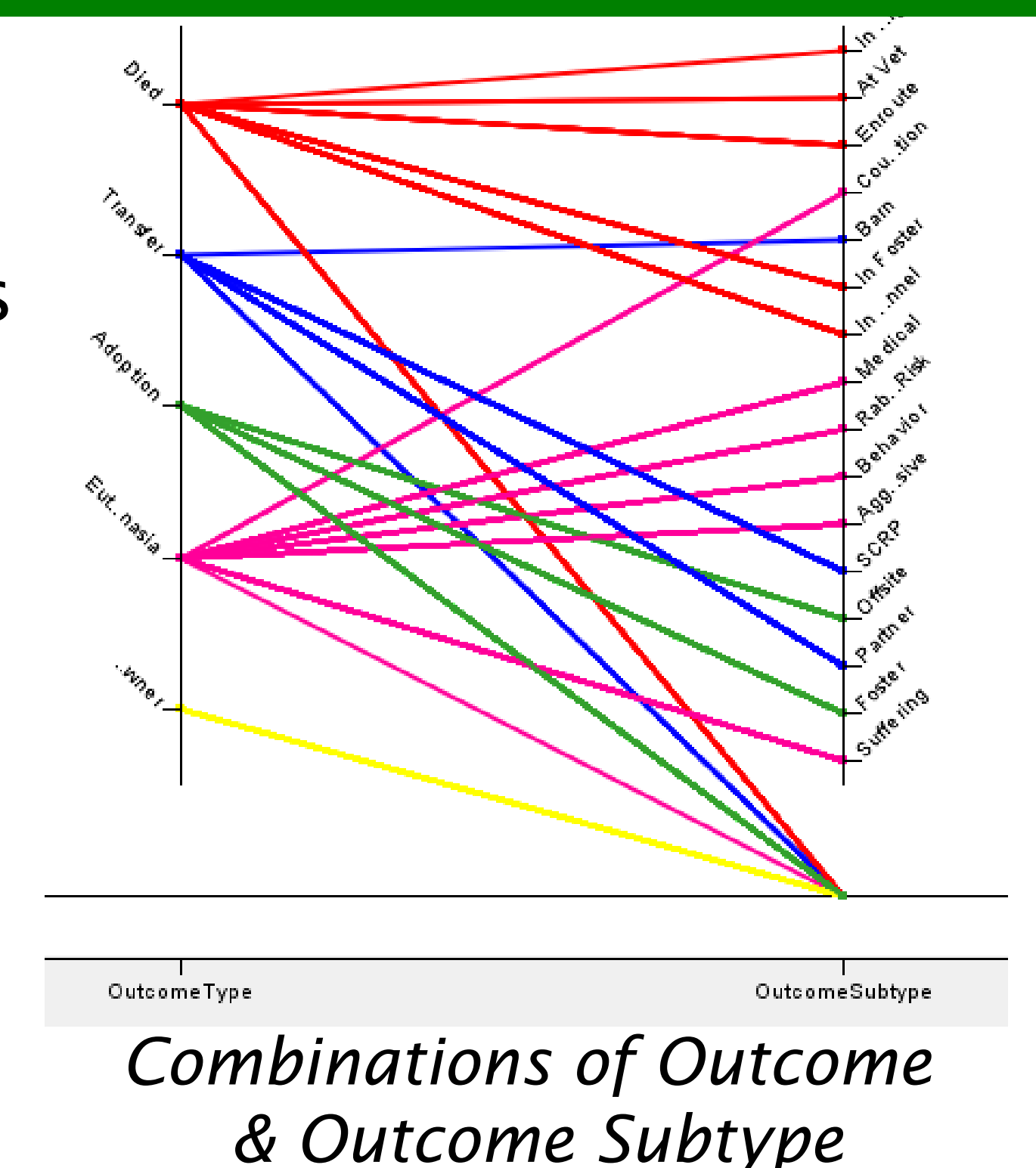
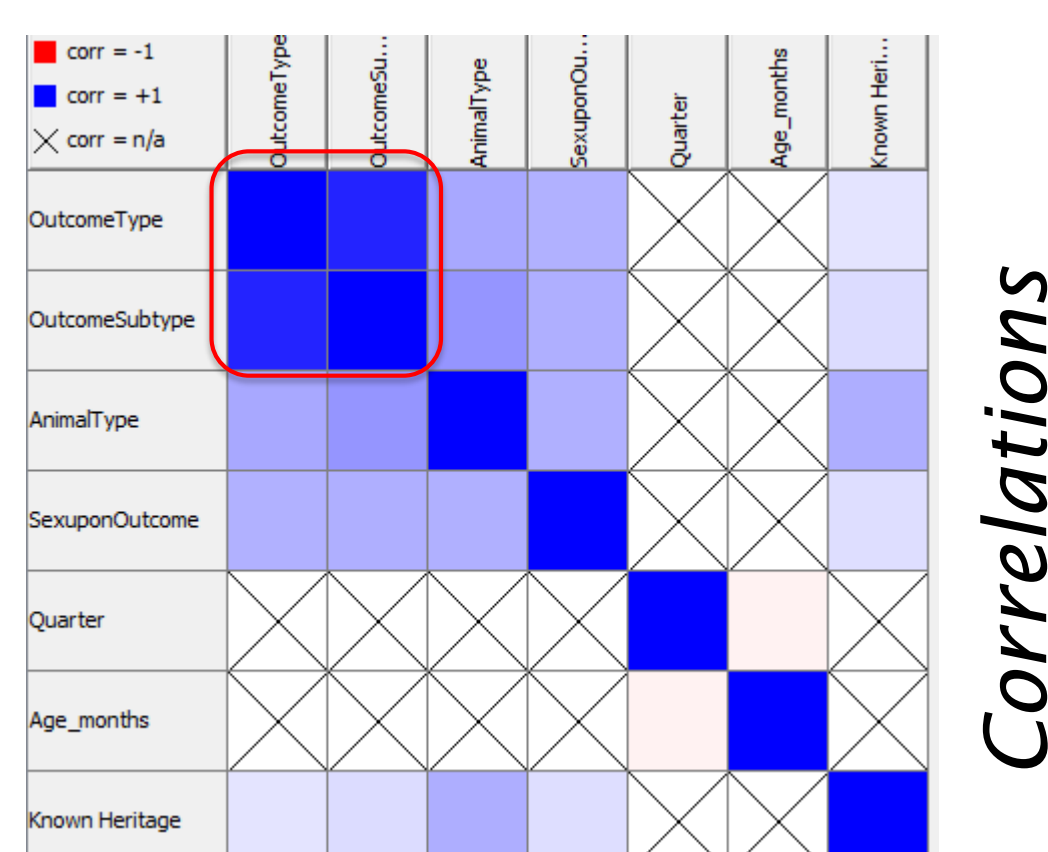
Prediction - OutcomeSubtype

- 16 poss. outcome values
- feature selection by backward elimination
- random forest** - 100 models; Gini Index

Prediction - Outcome

- 5 poss. outcome values
- feature selection by backward elimination
- random forest** - 100 models; Gini Index

* 80% training data vs. 20% test data partitioning



Results

- Accuracies of about **65.99 %** for **Outcome**
and about **69.06 %** for **OutcomeSubtype**
- Unable to correctly predict death of the animal;
high confusion between **Adoption** and **Return to Owner**

Conclusion

- By feature extraction and a preceding backwards elimination, we were able to predict the outcome based on five attributes with a moderate accuracy
- most important features: (1) **SexuponOutcome** (2) **age** (3) **animal type**

Knime-Workflow

