

SAS Cortex Predictive Analytics & Machine Learning Simulation Competition

Fundraising Scenario

A close-up photograph showing hands working on a wooden structure. One hand holds a piece of wood, and another hand uses a tool to work on it. The background is blurred.

By: Natalia Nino



Background

Fundraising campaign for a 12-year old, not-for-profit foundation with one million members. As part of its marketing activities this year, the foundation has decided to add a direct contact campaign. The cost to contact the first 60,000 members is \$5/person and the cost to contact additional members is \$25/person.

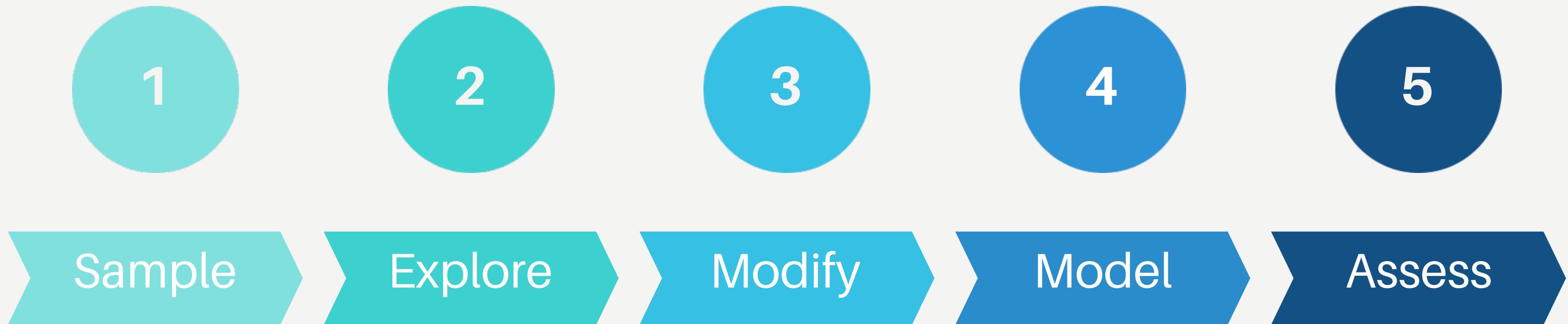
Objective

Maximize the net raised funds (i.e. operating surplus) given the costs of calling members.



Data Mining Approach

SEMMA PROCESS



Data Partition:
Training: 20%
Validation: 80%

Explore past
behaviour

Transform
Variable
Impute

AutoNeural
Regression
Decision Tree

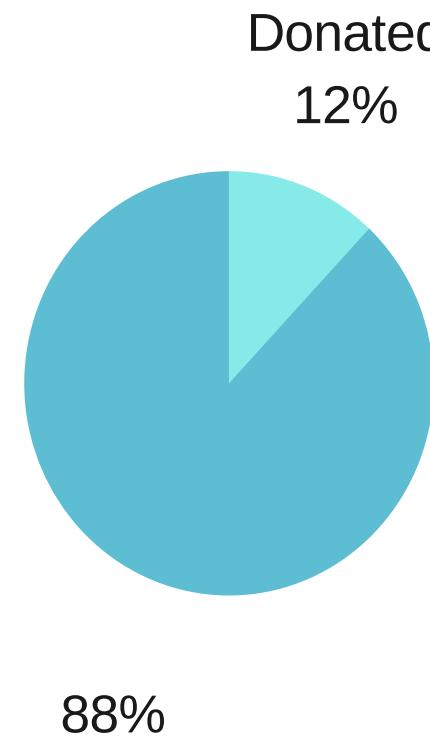
Model
Comparison

Exploring Past Behaviour:

What are the qualities of a members who most likely to donate?

34% of Members have attended an annual meeting

Approx. 120,000 Members donated last year



14% of Members referred at least 1 other member



46
Average age of member

\$65,000 is the average salary for members



Modifying Data: Variable Selection

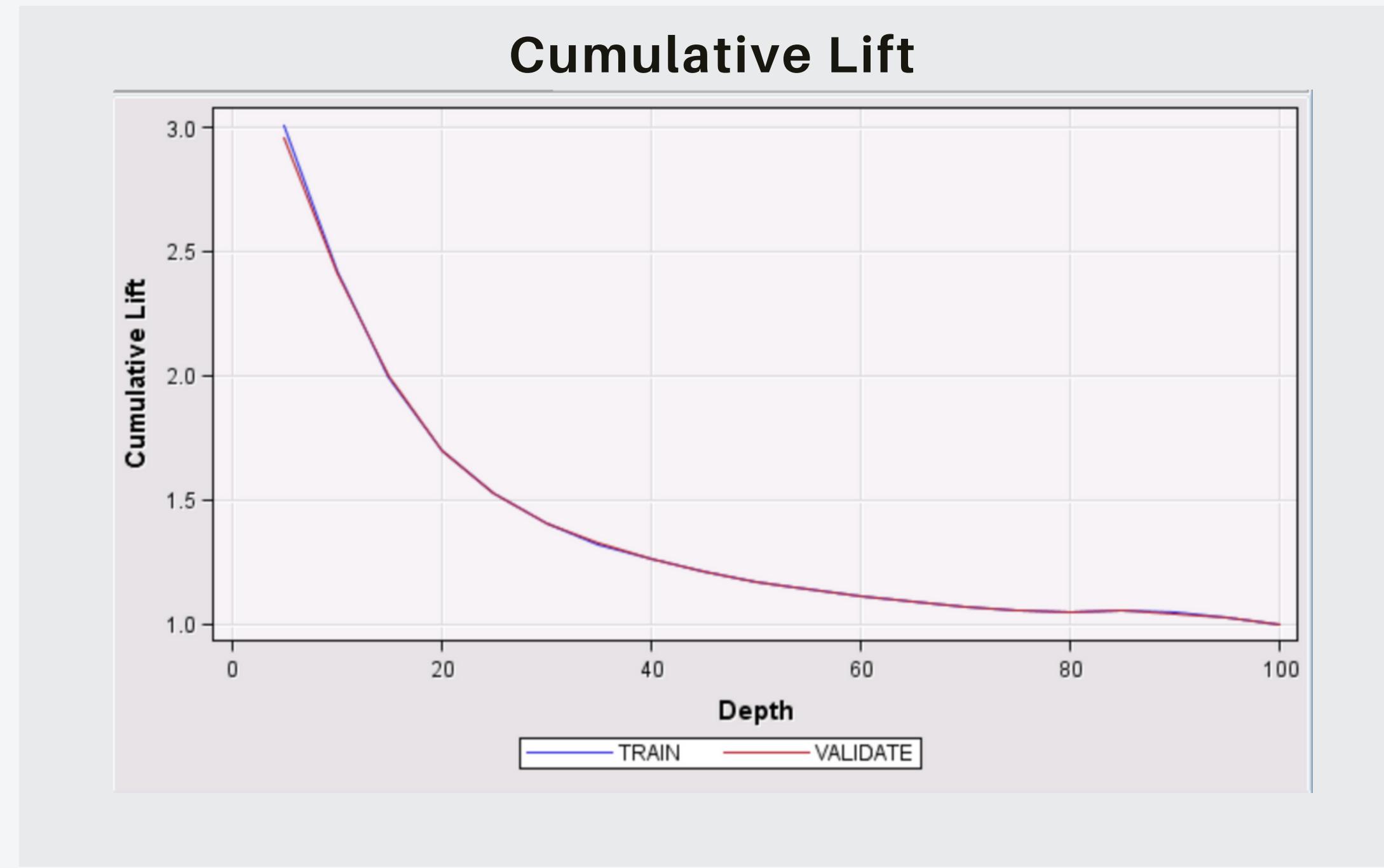
	MISSING VALUES	SKEWED	IMPUTE	TRANSFORM
Recency & Frequency	✓		✓	
Referrals & Salary		✓		✓
Max & Min Gift	✓		✓	



AutoNeural Model

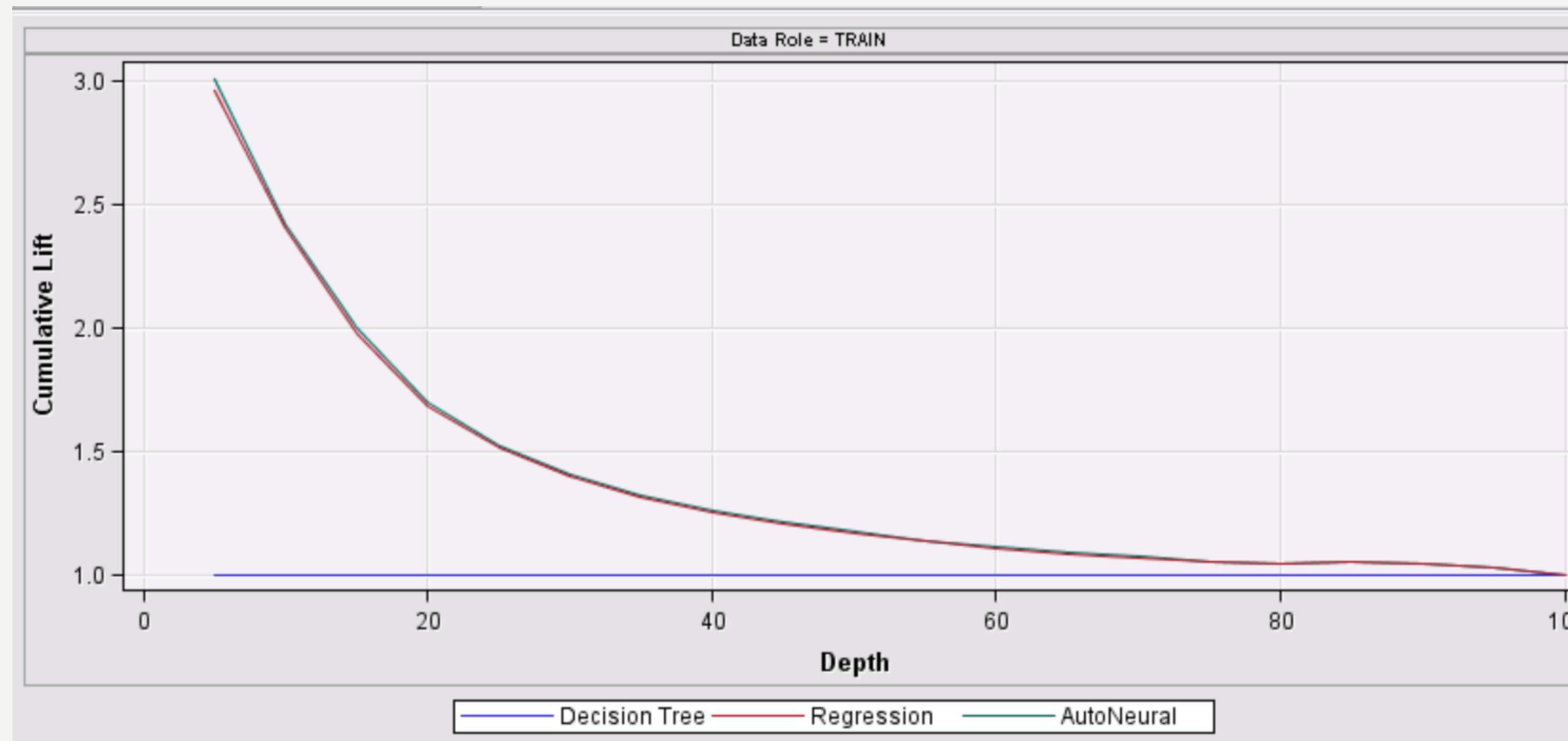
Performance

Trained to detect a pattern and predict the likely hood of a member donating.



Model Comparison

Cumulative Lift



Autoneural: Lowest misclassification rate & lowest average error.

Who to contact?

The “persuadables”

Donate if contacted

YES

PERSUADABLES



NO



Donate if not contacted

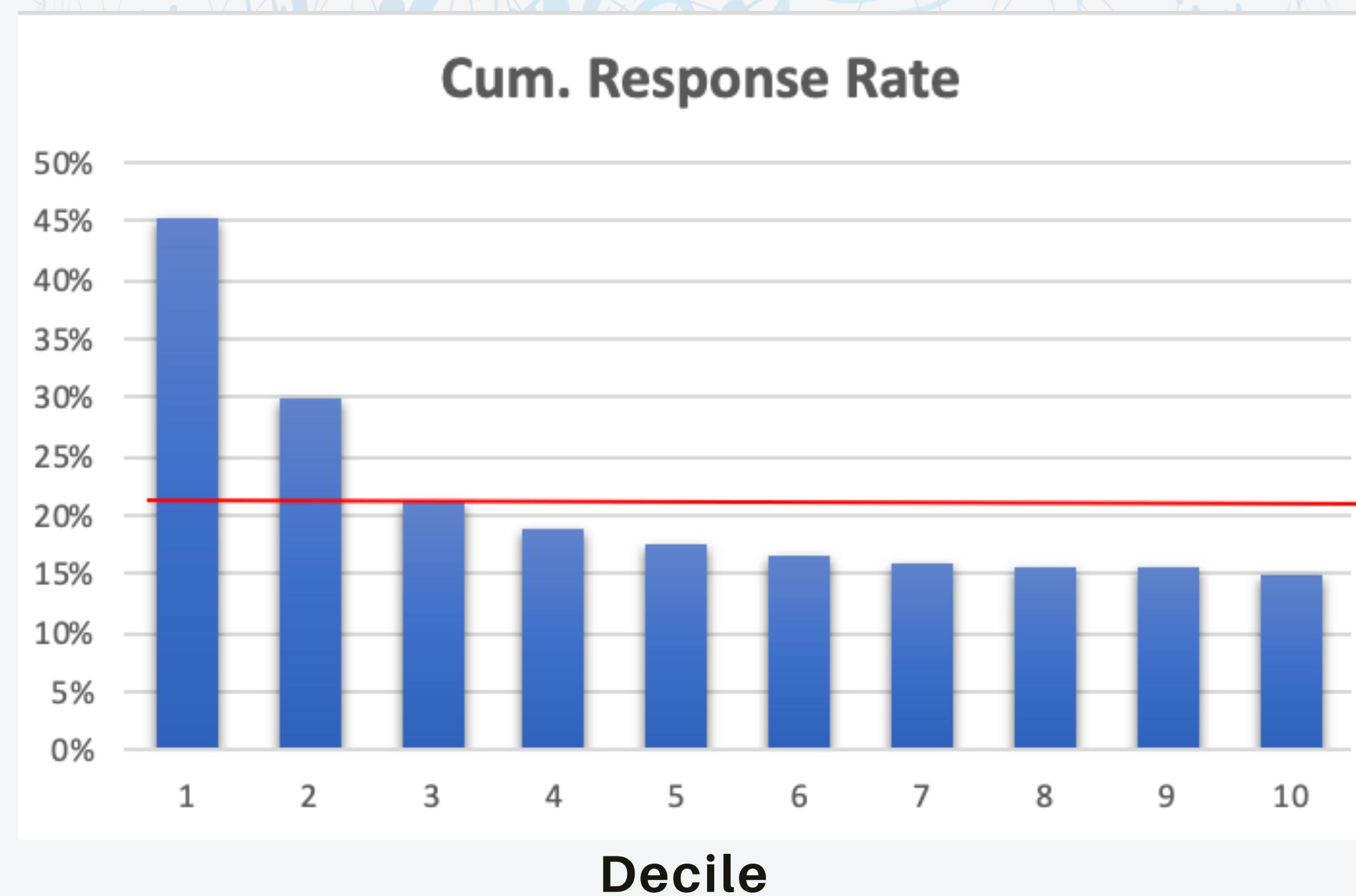
Probability of members donating when contacted - Probability of members not donating when contacted

NO

AutoNeural Model

Performance

When looking at the cumulative response rate the top two deciles had a cumulative response rate of 30%.



The Prediction : AutoNeural Model



Recommendations



Direct Marketing Campaign:

Contact the 200,000 donors listed by the AutoNeural Model to fundraise the most in donation amount given the cost.

Personal Takeaways

- Predictive Analytics offers a unique opportunity to identify future trends and allows organizations to act upon them.
 - Actionable results.
- Importance of Modifying & Assessing the Model.



Thank You!

Contact Information:

LinkedIn:

<http://www.linkedin.com/in/natalianino>

Email:

natalianino06@georgebrown.ca