Special Topic

Executive Summary

Be Confident

- **Confidence is persuasive**
- **Positivity is professional**
- **Acknowledge uncertainties in the data or in the model results**
- **Imagine that you are selling your best friend's report and helping them to pass Exam PA**

Problem Statement

- How can this report can help the business?

Data

- What does one row represent?
- What are the dimensions?
- What changes did you make?

Model Selection

- Which models were used?
- What are the advantages and disadvantages?
- Which variables were predictive?
- What was the performance (AUC, RMSE, R^2)?

Interpretation

- **What is the impact of each variable?**
  - Decision Tree bulleted list
  - GLM coefficients
  - RF or GBM partial dependence
  - Interaction effects
  - Examine test cases
- **Which variables are important?**
  - Stepwise selection or LASSO
  - RF or GBM feature importance

Business Implications

- Increase revenue?
- Decrease costs?
- Better understand the data?

Next Steps

R.O.I.D. 💪

Reader – Who is the audience?

Objective – Inference or prediction?

Issue – What is the business problem?

Data – What is the data?

This report helps **Reader** to perform **Objective** and solve **Issue** using **Data**

R.O.I.D

Reader: Who is the audience?

Merged and Acquired Clinics and Hospitals Executives

R.**O**.I.D

Objective:

Inference

R.O.**I**.D

Issue:

Help hospital administrators to better understand and manage patient needs by understanding the drivers of patient length of stay.

R.O.I.**D**

Data:

10,000 observations based on historical inpatient encounters for patients with diabetes from U.S. hospitals between 1999 and 2008.

R.O.I.D

"Our client, Merged and Acquired Clinics and Hospitals (MACH), has hired us to help their hospital executives gain a better understanding of the factors that drive inpatient length of stay. We used predictive analytics to identify the reasons why some patients are sent back home quickly and other patients need to spend several days in the hospital. We used historical inpatient encounters for patients with diabetes for U.S. hospital between the years of 1999 and 2008. Any conclusions of this report are limited to the population of this data set and would change if applied to a different population. "

Boiler Plate Paragraphs

"Prior to building the model, the data were reviewed for completeness, reasonableness, ethical concerns, and relevance. The variables included the X1, X2, X3, …"

OR

"Prior to building the model we checked the data in a variety of ways. The data contained X1, X2, X3, …"

"After modifying a few features to prepare them for modeling, I tried a variety of models to see which would best explain the factors affecting the length of hospital stays. Each model was calibrated using 70% of the data and then its performance was measured using the other 30%. This process helps identify models that adequately capture the patterns in the data and generalize well to new data. "

OR

"I then tried a variety of models to see which would perform best. This is done by calibrating a model on 70% of the data and then seeing how that model performs on the other 30%. This replicates the way our model will be used in that the model will be predicting value for new applicants, who were not used to build the model."

R.O.I.D

Reader: Who is the audience?

ABC Insurance marketing department

R.**O**.I.D

Objective:

Inference

Example: June 18, 2019:

R.O.**I**.D

Issue:

Increase the number of customers who purchase the product by understanding the different aspects of the marketing campaign.

R.O.I.D

Data:

10,000 observations for 14 variables that include personal information about the potential purchaser, the timing of the call, economic indicators at the time of the call, and whether a purchase was made.

R.O.I.D

"I have been asked to advise the marketing department at ABC insurance on what efforts will be most productive in terms of purchases for future marketing campaigns for a particular insurance product, based on data collected from a completed marketing campaign. The data has been analyzed using predictive models to bring out what aspects of the marketing campaign have the greatest impacts on whether customers purchase the product. Because the data is specific to just this product, this advice is also specific to just this product. The data did not include any experience in January or February, so no predictions on marketing campaigns for this product in these months can be made. The data contains 10,000 observations for 14 variables that include personal information about the potential purchaser, the timing of the call, economic indicators at the time of the call, and whether a purchase was made, the variable to be predicted in the future based on the other variables. In this data, 46% of calls resulted in a purchase. "
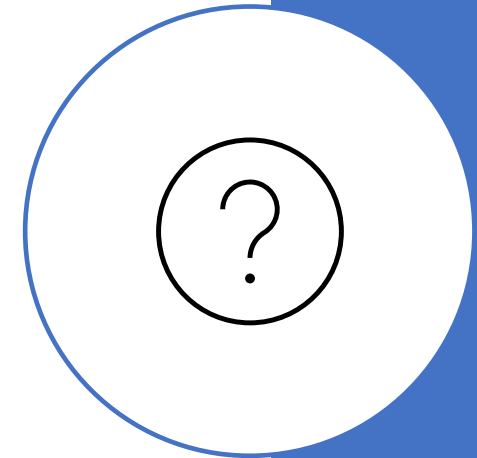
Quiz

Find the R.O.I.D for the December 12, 2019 Exam PA.
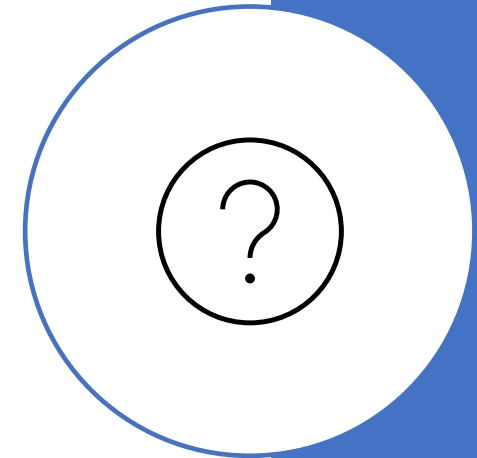
R:

O:

I:

D:

Solution

R: MEB marketing team

O: Prediction

I: Increase profits by determining if a customer is high value or low value

D: 40,410 observations on prior customers who are age 25 or older.

R.O.I.D

Solution

"The MEB marketing team have asked us to build a model that can predict if an applicant will be a high-value or low-value customer. We were supplied with 48,842 observations on prior customers that can be used to build a model and gauge the potential profit from using it. I was informed that this product would be sold only to customers age 25 and older, so younger policyholders were removed from the data, leaving 40,410 to analyze. The model we constructed is relatively simply to apply and produced a profit of 4.92 per applicant."

Increase typing speed

- **Your executive summary should be 1,000 – 2,000 words**
- **Save time by increasing your typing speed to at least 60 Words Per Minute (WPM)**
- **Practice on our Exam PA Practice Texts**

Worked Example

- **Start with the SOA's solution files**
- **Rewrite just the Executive Summary**

Project Statement

Executive Summary (20 points)

"Your executive summary should reflect the information provided and work from Tasks 1-8 as relevant to the North Carolina Department of Transportation. Your executive summary should include a problem statement and a coherent explanation of all the steps leading to your recommended model and conclusions. "