PROJECT 2: PREDICTING PH

DATA 624 - Predictive Analytics
Group 2

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Introduction

This project is designed to evaluate production data from a beverage manufacturing company. Our assignment is to predict PH, a Key Performance Indicator (KPI), with a high degree of accuracy through predictive modeling. After thorough examination, we approached this task by splitting the provided data into training and test sets. We evaluated several models on this split and found that **what-ever-worked-best** method yielded the best results.

Each group member worked individually to create their own solution. We built our final submission by collaboratively evaluating and combining each others' approaches. Our introduction should further outline individual responsibilities. For example, **so-and-so** was responsible for **xyz task**.

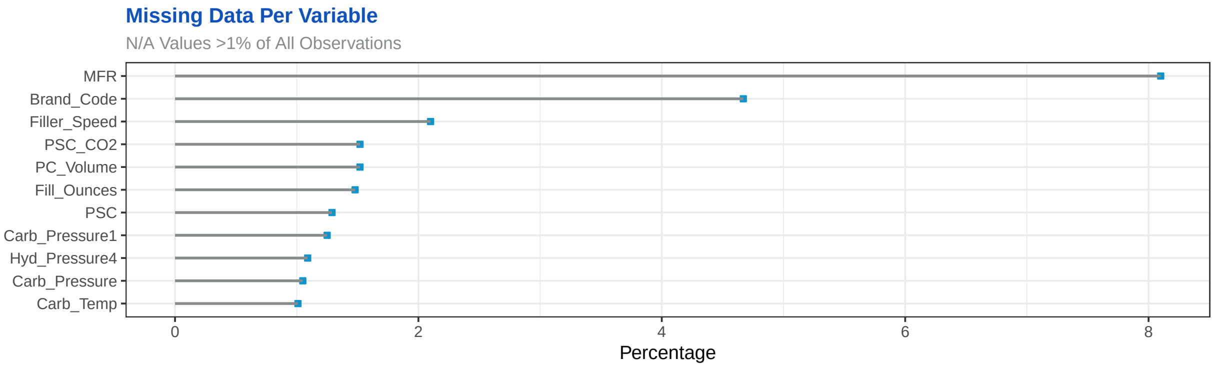
For replication and grading purposes, we made our code avaliable in the appendix section. This code, along with the provided data, score-set results, and individual contributions, can also be accessed through our group github repository:

- Pretend I'm a working link to R Source Code
- Pretend I'm a working link to Provided Data
- Pretend I'm a working link to Excel Results
- Pretend I'm a working link to Individual Work

1 Data Exploration

The beverage manufacturing production dataset contained 33 columns/variables and 2,571 rows/cases. In our initial review, we found that the response variable, PH, had four missing observations. We choose to drop the complete cases of the observations with null data in the target as they accounted for such a small proportion (< 0.002%) of the observations.

We also identified that 94% of the predictor variables had missing data points. Despite this high occurance, the NA values in the majority of these predictors accounted for less than 1% of the total observations. Only eleven variables, highlighted in the plot below, were missing more than 1% of data:



Without additional data regarding production, we assume that the NA values are missing at random. We applied a Multiple Imputation by Chained Equations (MICE) algorthim, which uses sequential regression to create multiple imputations across all the incomplete cases (including categorical data).

Predictor Variables

Response Variable

Understanding the influence PH has on our predictors is key to building an accurate predictive model. PH is a measure of acidity/alkalinity that must conform in a critical range.

Data Transformations

Text text text.

2 Predictive Modeling

Text text.

Train

Train text.

Test

Test text.

3 Discussion

Eval text. The end.

4 Conclusion

sfasdfs

Appendix

Code & stuff here.