Determining optimum insurance product portfolio through predictive analytics

Group A1

Dinesh Ganti
Gauri Singh
Shouri Kamtala
Supreet Kaur
Vinayak Palankar

Business Objective

- **Role**: Consultant to a entrepreneur who is evaluating a new business venture

- **Business idea**:
  - ❖ Offer from time to time a “deal” on certain products
  - ❖ Registered customers get a certain percentage of price drop
  - ❖ Price drop in the next price change cycle after purchase

- **Goal**: To help evaluate if the business venture can be viable

Data Mining Objective

Step 1: Use available data of various products sold by the five online retailers as predictors to classify products as

Price  Or not 

Step 2: Rank order them in terms of probability of price increase.

Step 3: Select top x% to offer insurance on.

Data Manipulation

- Data Transformation
  - Converted categorical data into dummies

    E.g. freeShipping, siteName and InStock

  - Predicted missing values of input variables using K-NN

    E.g. avRating and reviewCount

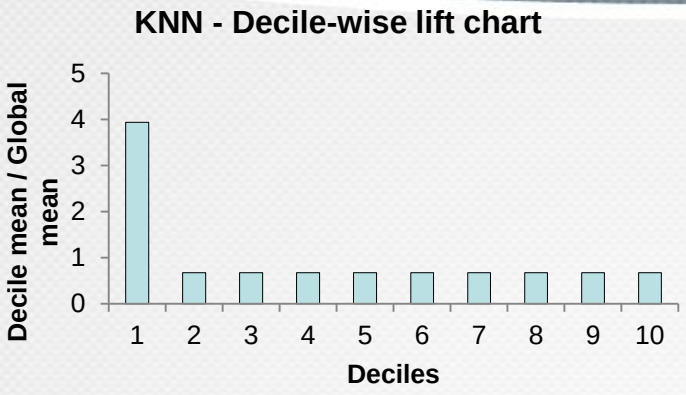
  - Numerical transformation using averages

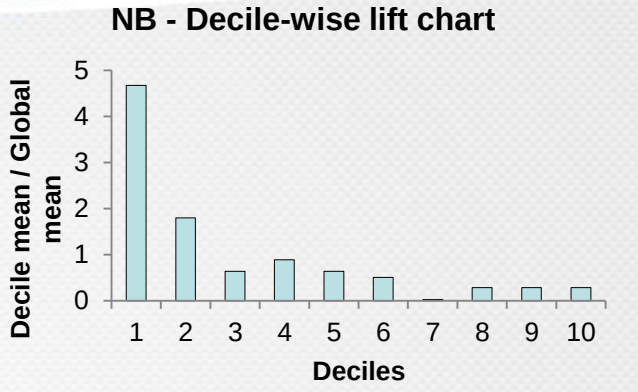
    E.g. shippingPeriod

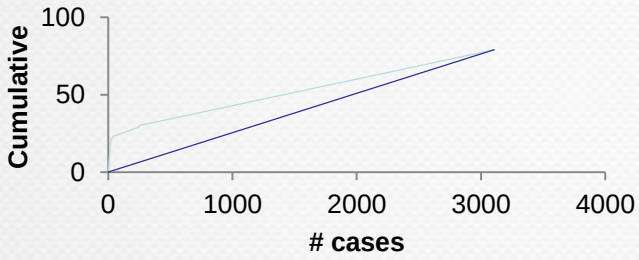
  - Derivation of values from existing variables

    E.g. TimeLast from date

Evaluation of Methods







- We have evaluated the models based on lift over Naïve
- We are interested in selecting the top x% of success cases
- Lift charts are an ideal performance metric for this objective
- We have looked at lift charts over the validation data set

Recommendations/Insights

- Only 187 records have “Price up” among 7776
- Don’t partition?
- Using the Naïve rule, only 2.4% of products randomly selected would not show a price increase
- Using Naïve Bayes, the best among models tried, this goes up to ~11% among the top decile (sorted in descending order)

- Instead of looking at the top decile to offer insurance on, the top segment can be reduced to increase density of products with price rise
- If losses on the rest of the products selected don’t overwhelm ad and insurance revenue, business can be viable – more info needed