

Orange Juice Sales at Wasatch Grocery Chain

Determining Factors and Predictive Modelling of Minute Maid Sales

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Introduction

Wasatch Grocery Chain (WGC) is a regional grocery chain operating in the Intermountain West of the US. WGC sells two brands of orange juice in its stores, Citrus Hill (CH) and Minute Maid (MM) of which MM is the more profitable to the company. This report will identify what customer factors within available data contribute to purchase of MM over CH, as well as to what degree these factors influence customer choice. In addition, a predictive model is created that will allow the Sales Department to identify other customers within our customer base that are more likely to purchase Minute Maid brand orange juice, thus driving profitability across the company.

```
set.seed(1234)
df <- read.csv(url("http://data.mishra.us/files/project/OJ_data.csv"))
df[-1] <- lapply(df[-1], as.numeric)
df$Purchase <- as.factor(df$Purchase)
datasplit <- createDataPartition(df$Purchase, p = 0.7, list=FALSE) # Documentation says this should equa
train <- df[datasplit, ]
test <- df[-datasplit, ]
```

Available Data

The data set used in this report contains 13 possible predictor variables as well as 1 outcome variable, Purchase, which records whether or not a customer purchased MM. There are a total of 1070 observations in the data set. The data set was further partitioned into a **training** data set, containing 750 observations, and a validation **testing** data set containing 320 observations.

```
summary(df)
```

##	Purchase	PriceCH	PriceMM	DiscCH	DiscMM
##	0:417	Min. :1.690	Min. :1.690	Min. :0.00000	Min. :0.0000
##	1:653	1st Qu.:1.790	1st Qu.:1.990	1st Qu.:0.00000	1st Qu.:0.0000
##		Median :1.860	Median :2.090	Median :0.00000	Median :0.0000
##		Mean :1.867	Mean :2.085	Mean :0.05186	Mean :0.1234
##		3rd Qu.:1.990	3rd Qu.:2.180	3rd Qu.:0.00000	3rd Qu.:0.2300
##		Max. :2.090	Max. :2.290	Max. :0.50000	Max. :0.8000
##	SpecialCH	SpecialMM	LoyalCH	SalePriceMM	
##	Min. :0.0000	Min. :0.0000	Min. :0.000011	Min. :1.190	
##	1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:0.325257	1st Qu.:1.690	
##	Median :0.0000	Median :0.0000	Median :0.600000	Median :2.090	
##	Mean :0.1477	Mean :0.1617	Mean :0.565782	Mean :1.962	
##	3rd Qu.:0.0000	3rd Qu.:0.0000	3rd Qu.:0.850873	3rd Qu.:2.130	
##	Max. :1.0000	Max. :1.0000	Max. :0.999947	Max. :2.290	
##	SalePriceCH	PriceDiff	PctDiscMM	PctDiscCH	
##	Min. :1.390	Min. : -0.6700	Min. :0.0000	Min. :0.00000	
##	1st Qu.:1.750	1st Qu.: 0.0000	1st Qu.:0.0000	1st Qu.:0.00000	
##	Median :1.860	Median : 0.2300	Median :0.0000	Median :0.00000	
##	Mean :1.816	Mean : 0.1465	Mean :0.0593	Mean :0.02731	
##	3rd Qu.:1.890	3rd Qu.: 0.3200	3rd Qu.:0.1127	3rd Qu.:0.00000	
##	Max. :2.090	Max. : 0.6400	Max. :0.4020	Max. :0.25269	
##	ListPriceDiff				
##	Min. :0.000				
##	1st Qu.:0.140				
##	Median :0.240				
##	Mean :0.218				
##	3rd Qu.:0.300				
##	Max. :0.440				

```
summary(test)
```

```
## Purchase      PriceCH      PriceMM      DiscCH      DiscMM
## 0:125   Min.    :1.69   Min.    :1.690   Min.    :0.00000   Min.    :0.0000
## 1:195   1st Qu.:1.79   1st Qu.:1.990   1st Qu.:0.00000   1st Qu.:0.0000
##         Median :1.86   Median :2.090   Median :0.00000   Median :0.0000
##         Mean   :1.87   Mean    :2.081   Mean    :0.05362   Mean    :0.1164
##         3rd Qu.:1.99   3rd Qu.:2.180   3rd Qu.:0.00000   3rd Qu.:0.2000
##         Max.    :2.09   Max.    :2.290   Max.    :0.50000   Max.    :0.8000
##      SpecialCH      SpecialMM      LoyalCH      SalePriceMM
## Min.    :0.0000   Min.    :0.0000   Min.    :0.000011   Min.    :1.190
## 1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.374063   1st Qu.:1.690
## Median :0.0000   Median :0.0000   Median :0.600000   Median :2.090
## Mean    :0.1281   Mean    :0.1562   Mean    :0.578387   Mean    :1.965
## 3rd Qu.:0.0000   3rd Qu.:0.0000   3rd Qu.:0.863765   3rd Qu.:2.130
## Max.    :1.0000   Max.    :1.0000   Max.    :0.999870   Max.    :2.290
##      SalePriceCH      PriceDiff      PctDiscMM      PctDiscCH
## Min.    :1.390   Min.    :-0.6700   Min.    :0.00000   Min.    :0.00000
## 1st Qu.:1.750   1st Qu.: 0.0000   1st Qu.:0.00000   1st Qu.:0.00000
## Median :1.860   Median : 0.2300   Median :0.00000   Median :0.00000
## Mean    :1.816   Mean    : 0.1485   Mean    :0.05578   Mean    :0.02831
## 3rd Qu.:1.890   3rd Qu.: 0.3000   3rd Qu.:0.10050   3rd Qu.:0.00000
## Max.    :2.090   Max.    : 0.6400   Max.    :0.40201   Max.    :0.25269
## ListPriceDiff
## Min.    :0.0000
## 1st Qu.:0.1400
## Median :0.2400
## Mean    :0.2113
## 3rd Qu.:0.2700
## Max.    :0.4400
```

```
summary(train) #need to equalize the 0/1 split in train data set
```

```
## Purchase      PriceCH      PriceMM      DiscCH      DiscMM
## 0:292   Min.    :1.690   Min.    :1.690   Min.    :0.00000   Min.    :0.0000
## 1:458   1st Qu.:1.790   1st Qu.:2.090   1st Qu.:0.00000   1st Qu.:0.0000
##         Median :1.860   Median :2.110   Median :0.00000   Median :0.0000
##         Mean   :1.866   Mean    :2.087   Mean    :0.05111   Mean    :0.1263
##         3rd Qu.:1.990   3rd Qu.:2.180   3rd Qu.:0.00000   3rd Qu.:0.2400
##         Max.    :2.090   Max.    :2.290   Max.    :0.50000   Max.    :0.8000
##      SpecialCH      SpecialMM      LoyalCH      SalePriceMM
## Min.    :0.000   Min.    :0.000   Min.    :0.000014   Min.    :1.190
## 1st Qu.:0.000   1st Qu.:0.000   1st Qu.:0.320000   1st Qu.:1.690
## Median :0.000   Median :0.000   Median :0.587000   Median :2.090
## Mean    :0.156   Mean    :0.164   Mean    :0.560404   Mean    :1.961
## 3rd Qu.:0.000   3rd Qu.:0.000   3rd Qu.:0.841445   3rd Qu.:2.130
## Max.    :1.000   Max.    :1.000   Max.    :0.999947   Max.    :2.290
##      SalePriceCH      PriceDiff      PctDiscMM      PctDiscCH
## Min.    :1.390   Min.    :-0.6700   Min.    :0.0000   Min.    :0.00000
## 1st Qu.:1.750   1st Qu.: 0.0000   1st Qu.:0.0000   1st Qu.:0.00000
## Median :1.860   Median : 0.2400   Median :0.0000   Median :0.00000
## Mean    :1.815   Mean    : 0.1456   Mean    :0.0608   Mean    :0.02689
## 3rd Qu.:1.890   3rd Qu.: 0.3200   3rd Qu.:0.1183   3rd Qu.:0.00000
## Max.    :2.090   Max.    : 0.6400   Max.    :0.4020   Max.    :0.25269
```

```
## ListPriceDiff
## Min.      :0.0000
## 1st Qu.:0.1400
## Median :0.2400
## Mean      :0.2209
## 3rd Qu.:0.3000
## Max.      :0.4400
```

Methods

Results

Conclusions and Recommendations

Brand

Sales