Analytics for Marketing Decisions - MKTG 464

Group Project (Total 18 Points)

Due Before Monday (06 / 10 / 19), 8:30 AM

Note:

- Data for this Group Project is available in the file **GP.csv**

- You need to show the relevant R output and also **briefly explain your results in plain English** and/or present the intermediate steps, equations/models used, assumptions, etc. Where possible, you must **clearly explain the managerial and/or marketing implications of the results**. Don't just report the final numbers / output as your answers.

- If after giving some thought, you have problems doing this assignment, do not hesitate to contact me (sumond@purdue.edu) or post clarifying questions on the discussion forum in Canvas.

Management of HATCO, an industrial supplier of custom-built intermediate products, has collected survey data from a random set of hundred customers (customers are managers of firms that buy their supplies from HATCO). Two types of information were collected. The first type of information relates to respondents' perceptions about HATCO on seven attributes. In past studies, these seven attributes were identified to be the most influential in firms' choice of suppliers. The second type of information relates to actual outcomes of the respondents' purchase relationships with HATCO - the percentage of each respondent's product purchases that are made from HATCO (i.e., "*share of wallet*") and the evaluations of each respondent's overall satisfaction with HATCO.

The data provided should give HATCO a better understanding of both the characteristics of its customers as well as the relationships between customers' perceptions of HATCO and their reactions towards HATCO (purchases and satisfaction).

A brief description of the variables in the database is provided below.

Perceptions about HATCO:

(Measured on a 0-10 scale with 0 representing "Poor" and 10 representing "Excellent")

ProdQual: Perception about the quality of custom-built intermediate products supplied by HATCO

DelvySpeed: Perception about the speed with which HATCO can deliver a custom-built product once an order has been confirmed

PriceLvl: Perception about the prices charged by HATCO relative to competitors' prices for similar custom-built products (**Note: A poor rating means that the customer feels that HATCO's prices are relatively high**)

PriceFlex: Perception about the willingness of HATCO representatives to be flexible and negotiate on the price of products

SalesforceImg: Image of HATCO's salesforce

OverallSrvc: Perception about the overall quality of service at HATCO (A good service quality is important for maintaining a satisfactory relationship with a customer)

HatcoImg: Overall image of HATCO

Purchase Outcomes:

Satisfaction: How satisfied is the respondent with past purchases from HATCO (Measured on a 0 - 10 scale with 0 representing "Very Unsatisfied" and 10 representing "Very Satisfied")

UsageLvl: How much of the respondent's firm's total supplies are purchased from HATCO (Effectively, this is the "share of wallet" allocated to HATCO; Ranges from 0 to 100 percent)

Questions

(**1 Point**) For overall presentation. This includes readability, clear reasoning and discussion of managerial insights, presentation of results or relevant output from R, use of specific references and labels for graphs, tables, etc.

1. (**1 Point**) Find the correlations between the seven perception variables. Which two variables have the highest amount of positive correlation? How would you interpret this correlation (use plain English)? Which two variables have the highest amount of negative correlation? How would you interpret this correlation (use plain English)?

2. (**1 Point**) Run a regression analysis with 'UsageLvl' as the dependent variable and all seven perception variables as the input variables. What proportion of the variation in Usage level in the sample data is explained by the seven perception variables? Which perception variables have a significant relationship with Usage level?

3. (**1.5 Points**) HATCO would like a linear regression equation with fewer input variables that does a reasonably good job of explaining the Usage level as a function of some of the important perception variables. Run a Linear Regression with the Stepwise Selection approach. Which perception variables have a significant relationship with Usage level? Interpret the significant slope coefficients in plain English.

4. (**2.5 Points**) Perform a cluster analysis of the customers of HATCO to discover segments in the market based on the perception data with the seven variables. Consider dividing the market into **two segments**. Profile the two customer segments. That is, report the segment sizes and the average values for the seven perception variables as well as the two purchase outcome variables in each segment. **Describe the two segments in plain English**.

5. (**4 Points**) Assume that the segment memberships, which you derived in Q4, are given to you. Estimate a Logistic Regression model to predict segment membership of customers

with the perception variables as inputs. Use the Stepwise Selection approach. Report the selected model (you are not required to interpret the slope coefficients), and the misclassification rates in your Training and Validation samples for the selected model. Next, estimate a Classification Tree to predict the segment membership and compare its performance with that of the logistic regression model.

6. **(6 Points)** More Profiling for the **two cluster solution**

    (A) Perform a factor analysis of the seven perception variables. **Describe and name your selected factors** (You are not required to construct or show any Perceptual Maps).
    (B) On which factors are the two clusters statistically different (Hint: Run appropriate hypothesis tests by using the factor scores)?
    (C) What key insights do you get from your results in Q4, Q5, and Q6(B)?

7. **(1 Point)** Write a brief executive summary (<u>place this at the top of your report</u>) to highlight the key managerial implications of your findings to HATCO's marketing department.