

## Lecture 8

1. You are the marketing analyst for a local restaurant. The restaurant periodically conducts advertising campaigns that include offers for gift cards, free appetizers, and priority seating. The restaurant has established a membership system and has assigned a passport number to its members and is able to track dining history and the amount spent at each visit. Download the file named *ch8\_P1restaurant.xlsx*. The file contains 18,095 transactions over the last two years. Each record includes the transaction number, the date of visit, the amount of bill, and the member's passport number.
  - a. Use a pivot table to identify the most recent transaction, frequency, and monetary value for each passport member.
  - b. Use lookup functions to assign scores for the recency, frequency and monetary values. The following cutoff points can be used:

Recency Cutoffs		Frequency Cutoffs		Monetary Value Cutoffs	
9/1/2012	1	1	1	\$0	1
5/1/2013	2	10	2	\$10	2
9/1/2013	3	20	3	\$40	3

- c. Generate descriptive statistics using charts, averages.

You are given \$13,000 to conduct the next marketing campaign directed specifically to passport members. Based on the past experiences, it is estimated the average cost to provide incentives to members included in the campaign is \$5.75.

- a. Formulate and solve a 0-1 LP model that uses recency data and seeks to maximize the expected revenue under budget limitations. The model should identify the recency values of members who should be included in the campaign.
  - b. Adjust the LP model so it identifies the percentage of customers from each recency segment who should be included in the campaign.
  - c. Now focus the analysis on the frequency of visits by members. Formulate and solve a 0-1 LP model to identify the frequency segments of customers who should be included in the campaign in order to maximize the expected revenues under the same budget constraints.
  - d. Also, adjust the frequency model to identify the percentage of customers from each segment.
  - e. Finally, focus the analysis on how much members have spent in each visit. Formulate and solve a 0-1 LP model to identify the monetary value segments of customers who should be included in the campaign in order to maximize the expected revenues under the same budget constraints.
  - f. Also, adjust the model to identify the percentage of customers from each segment.
  - g. Provide a side-by-side comparison of the results from the above LP models. The results should include overall campaign spending and expected revenue. Provide recommendations to restaurant management regarding the importance of recency, frequency, and monetary values for the members, and segments of customers who should be reached to maximize the future campaign revenues.

Answer: see *ch8\_P1\_P2restaurant\_solution.xlsx*

2. The Marketing and Sales departments of a shoe store have decided to perform an RFM analysis to determine whether and how to invest in their direct marketing customers. Sales transaction data has been acquired for an entire year. You are the marketing analyst for the shoe store and would like to determine the customer segments to target in an upcoming marketing campaign based on the customers' monetary spending, their recency of purchases, and their frequency. Use the *ch8\_P3shoes.xlsx*.

- a. Use a pivot table to identify the most recent transaction, frequency, and monetary value for each customer.
- b. Use lookup functions to assign scores for the recency, frequency, and monetary values. Use the 20th, 40th, 60th, and 80th percentiles to establish cutoff points for each dimension of recency, frequency, and monetary values.
- c. Generate descriptive statistics using charts, averages.

Assume that the next campaign for the company has a total budget of \$2,000 and the cost to reach a customer of \$9.00.

- a. Formulate and solve a 0-1 LP model and a continuous LP model that seeks to maximize the expected revenue for recency, under budget limitations.
- b. Formulate and solve a 0-1 LP model and a continuous LP model that seeks to maximize the expected revenue for frequency, under budget limitations.
- c. Formulate and solve a 0-1 LP model and a continuous LP model that seeks to maximize the expected revenue for monetary value, under budget limitations.
- d. Provide a side-by-side comparison of the results from the preceding LP models. The results should include overall campaign spending and expected revenue. Provide recommendations to the management team regarding the importance of recency, frequency, and monetary values for the customers, and regarding segments of customers who should be reached to maximize the future campaign revenues.

Answer: see *ch8\_P3\_P4shoes\_solution.xlsx*

3. Descriptive marketing analytics are used to help firms to identify current response rates, conversion rates, and campaign profitability.
  - a. \*True
  - b. False
4. Predictive marketing analytics are used to predict future response rates, conversion rates, and campaign profitability.
  - a. \*True
  - b. False
5. Prescriptive marketing analytics can be used to reallocate future funds of marketing campaigns, provide the best possible mix of marketing channels, and optimize social media scheduling.
  - a. \*True
  - b. False
6. Descriptive analytics can be used to categorize customers into homogenous RFM segments based on their previous purchasing behavior.
  - a. \*True
  - b. False
7. Marketing prescriptive models can utilize RFM data to maximize future valuation of marketing campaigns under limited campaign resources.
  - a. \*True
  - b. False
8. Marketing prescriptive models can be used to create a balance between type I and type II errors.
  - a. \*True
  - b. False
9. The specific cutoff points for each recency category depend on the type of purchases and products.
  - a. \*True
  - b. False
10. The specific cutoff points for each frequency category depend on the type of purchases and products.
  - a. \*True
  - b. False
11. Which of the following is the main factor that has led to the explosion of available data about customers?

- a. The increased number of customers
  - b. The increased number of purchases by customers
  - c. \*The increase number of records due to automatic capture of customer transactions
  - d. Increased customer feedback via online surveys
12. Marketing analytics has three dimensions. Which of the following is not such a dimension?
- a. Descriptive analytics
  - b. \*Campaign analytics
  - c. Predictive analytics
  - d. Prescriptive analytics
13. The major purpose of predictive marketing analytics is to:
- a. Analyze the effectiveness and efficiency of investments in marketing.
  - b. Analyze marketing contributions to the sales pipeline.
  - c. \*Predict the future of campaign profitability.
  - d. All of the above
14. Which of the following must be captured, stored, and calculated to measure the recency dimension of the RFM approach?
- a. The date of the least recent purchase
  - b. \*The date of the most recent purchase
  - c. The average time between two purchases
  - d. All of the above
15. Which of the following must be captured, stored, and calculated to measure the monetary value dimension of the RFM approach?
- a. The date of most recent purchase
  - b. \*The average amount of sales for each customer
  - c. The average time between two purchases
  - d. All of the above
16. Marketing prescriptive models can be used to:
- a. Identify which customer segments will be most profitable.
  - b. Determine whether to continue promotional spending in order to generate future sales.
  - c. Determine whether to curtail spending and allocate marketing resources to more profitable customer targets.
  - d. \*All of the above
17. Which of the following Microsoft Excel functions can be used to count the number of purchases for a customer?

- a. VLOOKUP
- b. HLOOKUP
- c. \*Pivot table/COUNT
- d. Data series

18. Which of the following Microsoft Excel functions can be used to assign RFM scores for a customer?

- a. \*VLOOKUP
- b. Correlation
- c. Pivot table
- d. Data series

19. Linear programming models with a single RFM dimension are formulated as:

- a. Binary linear programming models.
- b. Non-binary linear programming models.
- c. \*Either a or b
- d. Neither a nor b

20. When the decision maker changes the binary requirement of the decision variables to become continuous variables in order to allow the partial reach of a given group, the solution will indicate:

- a. \*A greater-than-or-equal-to final value for the objective function.
- b. A lower-than-or-equal-to final value for the objective function.
- c. That the available budget will not be used.
- d. That available budget usage will not change.