Assignment 1

(To be done in teams. **Submit a pdf file to Quercus by 11:59 PM March 3**. One submission per team.)

This assignment will provide you with practice on how to segment a market and develop a targeting strategy using RFM analysis, the subject of Class 2. It is based on the Tuscan Lifestyles case and the associated data set, TuscanData.csv. Please read the case before doing the assignment.

Note: it is not necessary to show R code. What is important is to answer the questions below. In some cases, it may be necessary to show R output in order to do so.

TuscanData.csv has the following variables for a randomly chosen test sample:

1. numords: total number of past purchases (frequency variable)
2. totdol: total dollar value of past purchases (monetary value variable)
3. last: days since previous purchase (recency variable)
4. buyer & buyerdummy: whether a customer bought from the test catalog (0: no; 1: yes)
5. dollars: how much a buyer spent when they ordered from the test catalogue

1. What percentage of customers bought from the test catalogue? (5 points) Show the summary statistics (mean and standard deviation) of how much each buyer spent. (5 points)

2. Create the quintiles for Recency (R), Frequency (F), and Monetary Value (M). Show 5 observations with their R, F, and M values and quintiles. (10 points)

3. Display the averages of R, F, and M for each quintile in a bar chart. (5 points)

4. Draw bar charts showing how response probability varies by R, F, and M quintiles (5 points). Comment briefly on what you learn from these bar charts (5 points).

5. For this and the remaining questions, use the following numbers:
   - 1,834,469 remaining customers (excluding the 5% used in the test)
   - Cost of goods and service = 50% of revenue
   - Cost of mailing an offer = $1
   - Average revenue per customer from those who order = (you calculated this in Q1)

   Suppose that Tuscan Lifestyles sends a mailing to **all** 1,834,469 remaining customers. Calculate the profitability of this mass-marketing strategy.

   a. How many buyers should you expect? (5 points)
   b. Net profit? (5 points)
   c. Return on marketing expenditure (ROI? (5 points)

6. Calculate the break-even response rate. (10 points)

7. Using an independent-quintile RFM approach and the break-even response rate, calculate:

   a. optimum fraction of the market to target (10 points),

b. the expected response rate (10 points)
c. net profit (5 points)
d. ROI of marketing expenditure (5 points)
e. Briefly explain why the RFM approach yields more profit and ROI than the mass-marketing approach (10 points)