HW Assignment 5
Probability Models

Vespur© is a new service that provides rides in Vespas at a modest prices. Tech experts and investors in San Francisco call it the "Uber for the European people." Users download the app onto their mobile devices and request a ride when they need one. A Vespa driver shows up in a matter of minutes and takes the customer to the requested destination.

In August 2015 Vespur© ran a promotional campaign encouraging customers to download the app. Once the user downloaded the app, she would insert a promotional code and would enjoy a free ride wherever she wanted. The company has no data on how many people downloaded the app, but it tracks customers from their first ride on. They observe that some customers use the service almost every week, while others have rarely used it after their first ride. Another observation is that almost no customer uses the service twice in the same week.

You have been hired as a consultant and your job is to forecast transactions for the 5,000 customers who had their first ride on the first week of August 2015. You obtained weekly data on whether a customer used the service in a particular week for the first 2 months following their first ride. (The data are available in the file 'vespur_rawdata.xlsx')

Your job as analyst is to compute:

1. How many transactions (from the 5,000 customers you are analyzing) should the company expect for the first week of October?
2. Let us consider a customer who used the service in every week (during both August and September). What is the probability that she will make a transaction in the first week of October?
3. What if we consider a person who made 4 transactions in August (every week in August) but none in September. What is the probability that she will make a transaction in the first week of October?
4. Assuming a discount rate of 10%, what is the number of discounted expected residual transactions for:
    a. A user who only had the first free ride?
    b. A user had two rides, with the last ride occurring in the last week of August?
    c. A user who user who had a ride on every single week during both August and September?

DELIVERABLE: One-page report with a very brief description of the model you used, the parameter estimates, and the answers to questions #1 to #4.

IMPORTANT: It is highly recommended to read the note and use the spreadsheet available in http://brucehardie.com/notes/010/

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