MKTG/STAT 4760/7760
Spring 2026

Homework #2

1. Derive the probability mass function and the forward recursion formula for an NBD model for a period of length *t*.

2. On Canvas, you'll see the "HW prescription data" spreadsheet, containing data on the number of prescriptions for a particular drug written by a sample of 1923 doctors in a given month. Fit an NBD model and show the expected distribution for the number of prescriptions over a 12-month period (assuming stationarity).

3. Consider an NBD model for which the variance is twice the mean, and the mean is twice the value of P(0). What are the values of r and α? Show the key steps of your analysis.

4. The table below shows the number of surveys filled out by a sample of 1865 Americans in 1995:

Table 1
CLAIMED PARTICIPATION AMONG CMOR RESPONDENTS

	Number of Surveys in Past Year				
	0	*1*	*2*	*3–5*	*6+*
Number of respondents	1020	166	270	279	130
Percentage of respondents	54.7	8.9	14.5	15.0	7.0

Source: O'Neill 1996.

Fit an NBD model to these data. Think carefully about how you'll handle that "3-5" cell…