# ACSC/STAT 3703 - Winter 2026 - Assignment 6

## Due: Wednesday, April 1, 11:59 PM

1. Let $X_j = I_j B_j$ and $S = \sum_{j=1}^{n} X_j$, where $I_1, I_2, \ldots, I_n, B_1, B_2, \ldots, B_n$ are independent.

   $B_j$ has moment generating function $M_{B_j}(z)$.

   $I_j = 1$ with probability $q_j$, and $I_j = 0$ with probability $1 - q_j$.

   It follows that $E[e^{B_j I_j z} | I_j = 0] = E[e^0] = 1$ and $E[e^{B_j I_j z} | I_j = 1] = M_{B_j}(z)$.

   (a) Combine these to find $M_{X_j}(z) = M_{B_j I_j}(z) = E[e^{B_j I_j z}]$.

   (b) Now find $M_S(z)$.

   and from the textbook:

2. 9.63, parts a,b,c

3. 9.69