Homework 3

Problem of the week. Suppose the number of network blackouts in a day has the following probability distribution:

$$p(0) = 0.20, p(1) = 0.30, p(2) = 0.50.$$

Assume that the number of blackouts on different days are independent. What is the probability that there are more blackouts on a Tuesday than on a Monday?

Solution Let M and T respectively denote the number of blackouts on Monday and Tuesday. Then,

$$\begin{aligned} P(T > M) &= P(T = 1, M = 0) + P(T = 2, M = 0) + P(T = 2, M = 1) \\ &= P(T = 1)P(M = 0) + P(T = 2)P(M = 0) + P(T = 2)P(M = 1) \\ &= (0.30)(0.20) + (0.50)(0.20) + (0.50)(0.30) = \boxed{0.31} \end{aligned}$$

The second equality above follows from independence.

This problem is similar to the practice problem 6 in Chapter 3 of MB.