Statistics
Chapter 7
Discrete Probability Distributions

“This review is to look at the calculations in this chapter. Do NOT forget that there is a lot of terminology in statistics that is important to learn for success in MATH1020.”

1. The following table contains the probability distribution of the number of traffic accidents daily in a small city.

<table>
<thead>
<tr>
<th>Number of Accidents Monthly (X)</th>
<th>P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.10</td>
</tr>
<tr>
<td>1</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>0.45</td>
</tr>
<tr>
<td>3</td>
<td>0.15</td>
</tr>
<tr>
<td>4</td>
<td>0.05</td>
</tr>
<tr>
<td>5</td>
<td>0.05</td>
</tr>
</tbody>
</table>

A. Compute the mean.
B. Compute the standard deviation.
C. Compute the variance.
D. What is the probability of 3 accidents?
E. What is the probability of more than 3 accidents?
F. Suppose Y represents the number of parking tickets issued monthly. Determine the probability distribution for the number of parking tickets issued monthly where $Y = 4X$.
G. Use the probability distribution from F to find the mean and variance of parking tickets issued monthly.
H. Use the laws of expected value and variance to calculate the mean and variance of number of accidents monthly from the mean and variance of the number of parking tickets issued monthly. Are the means and variance the same?
2. An important part of the customer service representatives of a telephone company relate to the speed in which the representatives respond to service calls. Suppose past data indicate that the likelihood is 70% that troubles in the service can be repaired on the same day. If there were five service calls reported today, what is the likelihood that:

A. All five will be repaired on the same day?
B. At least three will be repaired on the same day?
C. Fewer than two will be repaired on the same day?
D. How many service calls would you expect to get repaired on the same day?
E. What is the variance?
F. What is the standard deviation?

3. The C-G-N Insurance Company provides insurance for families who hire moving companies to help them move. A recent report has found that there is an average of 3 insurance claims made per hour. What is the probability that:

A. Fewer than three claims will be made?
B. Exactly three claims will be made?
C. Three or more claims will be made?
D. More than three claims will be made?