Lecture 11 Summary (Chapter 4)

Example 13 \( P(\text{Good}) = .6, P(\text{West}|\text{Good}) = .3 \) and \( P(\text{East}|\text{Fair}) = .2 \)

<table>
<thead>
<tr>
<th></th>
<th>W</th>
<th>E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>.18</td>
<td>.42</td>
<td>.60</td>
</tr>
<tr>
<td>F</td>
<td>.32</td>
<td>.08</td>
<td>.40</td>
</tr>
<tr>
<td>Total</td>
<td>.50</td>
<td>.50</td>
<td>1</td>
</tr>
</tbody>
</table>

(a) Probability that the product selected is from West and is Good:

\[
P(WG) = P(W|G)P(G) = (.3)(.6) = .18
\]

(b) Given that the selected product is from West, what is the probability that this is Good?

\[
P(E|F) = P(E|F)P(F) = P(E|F)(1 - P(G)) = (.2)(1 - .6) = .08
\]

\[
P(E) = P(GE) + P(EF) = .5
\]

\[
P(G|W) = \frac{P(WG)}{P(W)} = \frac{P(WG)}{1 - P(E)} = \frac{.18}{.5} = .36
\]

(c) Since \( P(GW) = .18 \neq P(G)P(W) = (.6) (.5) = .3 \), \( G \) and \( W \) are not independent.

Since \( P(GE) = .42 \neq P(G)P(E) = (.6)(.5) = .3 \), \( G \) and \( E \) are not independent.

Computing: See the handout.