Example 1

Compute the reliability of the following system.

\[ \begin{align*}
\text{(A)} & \quad 0.99 \times 0.95 \times 0.85 = 0.799425 \\
\text{(B)} & \quad 0.99 \times 0.91 = 0.9009 \\
\end{align*} \]

Replacing \( \text{(A)} \) and \( \text{(B)} \):

\[ \begin{align*}
\text{C} & \quad 0.7994 + 0.9 \times (0.7994 \times 0.9) = 0.9799 \\
\end{align*} \]
Example 1 - cont.

\begin{align*}
0.9799 + 0.9009 - (0.9799)(0.9009) &= 0.998 \\
0.998 + 0.97 &= 0.968 \\
K &= 0.968
\end{align*}
Example 2

You have three different flight computers wired in parallel. For the system to be successful, at least two must function properly. What is the probability that 2 of the 3 flight computers will work? The reliabilities of the flight computers are 0.9, 0.85, 0.92.

\[
\begin{array}{c}
0.9 \\
0.85 \\
0.92 \\
\end{array}
\]

w \: 2/3 \: working

<table>
<thead>
<tr>
<th>Reliability</th>
<th>Working</th>
<th>2 or more working?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.7028</td>
<td>A, B, C</td>
<td>✓</td>
</tr>
<tr>
<td>0.0612</td>
<td>A, B</td>
<td>✓</td>
</tr>
<tr>
<td>0.1242</td>
<td>A, C</td>
<td>✓</td>
</tr>
<tr>
<td>0.0103</td>
<td>A</td>
<td>✓</td>
</tr>
<tr>
<td>0.0782</td>
<td>B, C</td>
<td>✓</td>
</tr>
<tr>
<td>0.0068</td>
<td>B</td>
<td>✓</td>
</tr>
<tr>
<td>0.0138</td>
<td>C</td>
<td>✓</td>
</tr>
<tr>
<td>0.0012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0000</td>
<td></td>
<td>0.9674</td>
</tr>
</tbody>
</table>

\[R_{2/3} = 0.9674\]