Money Chops

Prior: $\text{EV} = 460$

\[ P(A) = P(B) = 0.5 \]

\begin{align*}
\text{Bag A} &\quad | 60 \quad 40 \quad 100 \\
\text{Bag B} &\quad | 20 \quad 80 \quad 100 \\
\text{Total} &\quad | 80 \quad 120 \quad 200
\end{align*}

(a) Pull $\$10$:

\[ P(A \mid \$10) = \frac{P(\$10 \mid A) \cdot P(A)}{P(\$10)} = \frac{0.6 \cdot 0.5}{0.75} = 0.4 \]

\[ \Rightarrow \text{pick the bag that had } \$10 \]

(b) Pull $\{\$10, \$1, \$3\} = P(A \mid \{10, 1, 3\}) = 0.429

\[ LR_3 = \frac{P(A)}{1 + LR_3} = \frac{0.75}{1.75} = 0.429 \]

\[ LR_2 = LR_3 \cdot (CLR_{10})^2 \cdot (CLR_1)^2 = 1 \cdot 3 \cdot (0.5)^2 = 0.75 \]

\[ LR_0 = \frac{P(A)}{P(A)} = \frac{0.5}{0.5} = 1 \]

\[ CLR_{10} = \frac{P(\$10 \mid A)}{P(\$10 \mid A)} = \frac{0.6}{0.2} = 3 \]

\[ CLR_1 = \frac{P(\$1 \mid A)}{P(\$1 \mid B)} = \frac{0.4}{0.8} = 0.5 \]