\[ P(x \mid y) = \frac{P(y \mid x) \cdot P(x)}{P(y)} = \frac{\text{likelihood \cdot prior}}{\text{evidence}} \]

\[ P(x \mid y) = \frac{P(y \mid x) \cdot P(x)}{\sum_x P(y \mid x)P(x)} \]

\[ P(x \mid y, z) = \frac{P(y \mid x, z) \cdot P(x \mid z)}{P(y \mid z)} \]

\[
\begin{align*}
P(z \mid \text{open}) &= 0.6 & P(z \mid \neg \text{open}) &= 0.3 \\
P(\text{open}) &= P(\neg \text{open}) &= 0.5
\end{align*}
\]

\[ P(\text{open} \mid z) = ? \]
\[
P(x \mid z_1, \ldots, z_n) = \frac{P(z_n \mid x, z_1, \ldots, z_{n-1}) \ P(x \mid z_1, \ldots, z_{n-1})}{P(z_n \mid z_1, \ldots, z_{n-1})}
\]

- \(P(z_2|\text{open}) = 0.5\)
- \(P(z_2|\neg\text{open}) = 0.6\)
- \(P(\text{open}|z_1) = 2/3\)

\(P(\text{open} \mid z_2, z_1) = ?\)

Suppose \(P(\text{open}) = 5/8\). After you take the action, what is the probability the door is closed?

\(P(\text{closed} \mid u) = \)