$$P(x|y) = \frac{P(y|x)\ P(x)}{P(y)} = \frac{\text{likelihood} \cdot \text{prior}}{\text{evidence}}$$

$$P(x|y) = \frac{P(y|x)\ P(x)}{\sum_x P(y|x)P(x)}$$

$$P(x|y,z) = \frac{P(y|x,z)\ P(x|z)}{P(y|z)}$$

$P(z|open) = 0.6 \qquad P(z|\neg open) = 0.3$

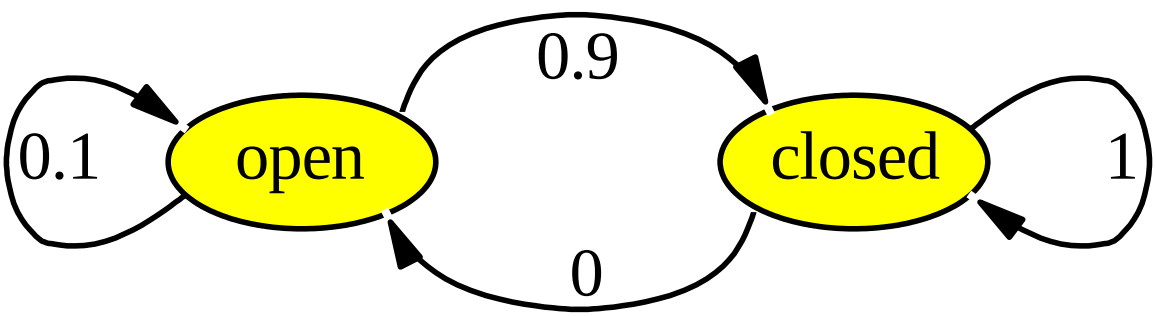
$P(open) = P(\neg open) = 0.5$

P(open | z) = ?

$$P(x \mid z_1, \ldots, z_n) = \frac{P(z_n \mid x, z_1, \ldots, z_{n-1})\, P(x \mid z_1, \ldots, z_{n-1})}{P(z_n \mid z_1, \ldots, z_{n-1})}$$

- $P(z_2|open) = 0.5$ $\quad$ $P(z_2|\neg open) = 0.6$
- $P(open|z_1)=2/3$

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



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

P(closed | u) =