

# Mini-TAREA 4-IIC2685

DATOS: O = OPEN, C = CLOSED

$$\rightarrow P(X_0=O) = P(X_0=C) = \text{BEL}(X_0=O) = \text{BEL}(X_0=C) = \boxed{0.5}$$

$$\rightarrow P(Z_t=O|X_t=O) = \boxed{0.6} \rightarrow P(Z_t=C|X_t=C) = \boxed{0.8}$$

$$\rightarrow P(X_t=O|U_t=\text{PUSH}, X_{t-1}=C) = \boxed{0.8} \rightarrow P(X_t=C|U_t=\text{DO-NOTHING}, X_{t-1}=C) = \boxed{1}$$

t=1

$$\rightarrow \overline{\text{BEL}}(X_1=O) = P(X_1=O|U_1=\text{DO-NOTHING}, X_0=O) \cdot \text{BEL}(X_0=O) + P(X_1=O|U_1=\text{DO-NOTHING}, X_0=C) \cdot \text{BEL}(X_0=C)$$

$$// = 1 \cdot 0.5 + (1-1) \cdot 0.5 = \boxed{0.5}$$

$$\rightarrow \text{BEL}(X_1=O) = \frac{P(Z_1=C|X_1=O) \cdot \overline{\text{BEL}}(X_1=O)}{P(Z_1=C|X_1=O) \cdot \overline{\text{BEL}}(X_1=O) + P(Z_1=C|X_1=C) \cdot \overline{\text{BEL}}(X_1=C)}$$

$$// = \frac{0.4 \cdot 0.5}{0.4 \cdot 0.5 + 0.8 \cdot 0.5} = \frac{0.2}{1.2} = \boxed{0.33} \text{ BEL}(X_1=\text{OPEN}) //$$

t=2

$$\rightarrow \overline{\text{BEL}}(X_2=O) = P(X_2=O|U_2=\text{PUSH}, X_1=O) \cdot \text{BEL}(X_1=O) + P(X_2=O|U_2=\text{PUSH}, X_1=C) \cdot \text{BEL}(X_1=C)$$

$$// = 1 \cdot 0.33 + 0.8 \cdot 0.66 = \boxed{0.87}$$

$$\rightarrow \text{BEL}(X_2=O) = \frac{P(Z_2=O|X_2=O) \cdot \overline{\text{BEL}}(X_2=O)}{P(Z_2=O|X_2=O) \cdot \overline{\text{BEL}}(X_2=O) + P(Z_2=O|X_2=C) \cdot \overline{\text{BEL}}(X_2=C)}$$

$$// = \frac{0.6 \cdot 0.87}{0.6 \cdot 0.87 + 0.2 \cdot 0.13} = \frac{0.522}{0.548} = \boxed{0.953} \text{ BEL}(X_2=\text{OPEN}) //$$