E step: For $\{HHH\}$, $W_0 = \dfrac{k \cdot P_0^3}{k \cdot P_0^3 + (1-k) \cdot P_1^3}$

$$= \frac{0.5 \times 0.6^3}{0.5 \times 0.6^3 + 0.5 \times 0.1^3}$$

$$= \frac{1080}{1085} \sim 0.9954$$

$$\Rightarrow W_1 = 1 - W_0 = \frac{5}{1085} \sim 0.0046$$

For $\{HHT\}$, $W_0 = \dfrac{k \cdot P_0^2 \cdot (1-P_0)}{k \cdot P_0^2 \cdot (1-P_0) + (1-k) \cdot P_1^2 \cdot (1-P_1)}$

$$= \frac{0.5 \times 0.6^2 \times 0.4}{0.5 \times 0.6^2 \times 0.4 + 0.5 \times 0.1^2 \times 0.9}$$

$$= \frac{720}{765} \sim 0.9412$$

$$\Rightarrow W_1 = 1 - W_0 = \frac{45}{765} \sim 0.0588$$

For $\{TTT\}$, $W_0 = \dfrac{k \cdot (1-P_0)^3}{k \cdot (1-P_0)^3 + (1-k) \cdot (1-P_1)^3}$

$$= \frac{0.5 \times 0.4^3}{0.5 \times 0.4^3 + 0.5 \times 0.9^3}$$

$$= \frac{320}{3965} \sim 0.0807$$

$$\Rightarrow W_1 = 1 - W_0 = \frac{3645}{3965} \sim 0.9193$$

$$M\ \text{step}: k = \frac{\frac{1080}{1085} + \frac{720}{765} + \frac{320}{3965}}{3} \sim 0.6724$$

$$P_0 = \frac{0.9954 \times 3 + 0.9412 \times 2}{9 \times 0.6724} \sim 0.8045$$

$$P_1 = \frac{0.0046 \times 3 + 0.0588 \times 2}{0.0046 \times 3 + 0.0588 \times 3 + 0.9193 \times 3} \sim 0.0455$$