

$$b \quad \text{Var}(X|Y=3) = (0 - E(X|Y=3))^2 P(X=0|Y=3) + (1 - E(X|Y=3))^2 P(X=1|Y=3) + (3 - E(X|Y=3))^2 P(X=3|Y=3)$$

$$P(X=0|Y=3) = \frac{P(X=0, Y=3)}{P(Y=3)} = \frac{.10}{.25} = \frac{2}{5}$$

$$P(X=1|Y=3) = \frac{P(X=1, Y=3)}{P(Y=3)} = \frac{.05}{.25} = \frac{1}{5}$$

$$P(X=3|Y=3) = \frac{P(X=3, Y=3)}{P(Y=3)} = \frac{.10}{.25} = \frac{2}{5}$$

$$E(X|Y=3) = 0 \times \frac{2}{5} + 1 \times \frac{1}{5} + 3 \times \frac{2}{5} = \frac{7}{5}$$

$$\text{Var}(X|Y=3) = (0 - \frac{7}{5})^2 \frac{2}{5} + (1 - \frac{7}{5})^2 \frac{1}{5} + (3 - \frac{7}{5})^2 \frac{2}{5} = 1.84$$

$$c \quad E(Y) = E(Y|X=0) P(X=0) + E(Y|X=1) P(X=1) + E(Y|X=3) P(X=3) = E(Y|X=0) \cdot .35 + E(Y|X=1) \cdot .20 + E(Y|X=3) \cdot .45$$

Il s'agit ensuite de trouver les espérances conditionnelles comme en b.