

章末問題 1-17 の解答 (新納)

$$\begin{aligned} MI(X, Y) &= \sum_{x,y} P(x, y) \log \frac{P(x, y)}{P(x)P(y)} \\ &= \sum_{x,y} \left( P(x, y) \log \frac{P(x, y)}{P(y)} - P(x, y) \log P(x) \right) \\ &= \sum_{x,y} (P(x, y) \log P(x|y) - P(x, y) \log P(x)) \\ &= -H(X|Y) - \sum_{x,y} P(x, y) \log P(x) \\ &= -H(X|Y) - \sum_x P(x) \log P(x) \\ &= -H(X|Y) + H(X) \end{aligned}$$