

## Reading Assignment 1

Q1.

$$\begin{aligned} E &= -(9/14 \log(9/14) + 5/14 \log(5/14)) \\ &= -(-0.414 - 0.530) \\ &= 0.944 \end{aligned}$$

$$\begin{aligned} E1 &= -(3/7 \log(3/7) + 4/7 \log(4/7)) \\ &= -(0.522 - 0.463) \\ &= 0.985 \end{aligned}$$

$$\begin{aligned} E3 &= -(6/7 \log(6/7) + 1/7 \log(1/7)) \\ &= -(-0.187 + 0.405) \\ &= 0.592 \end{aligned}$$

Q2.

$$\begin{aligned} \text{Expected Residual Value} &= 7/14 * H(3/7, 4/7) + 7/14 * H(6/7, 1/7) \\ &= 0.493 + 0.296 \\ &= 0.789 \end{aligned}$$

$$\begin{aligned} \text{Information Gain} &= E - \text{Expected Residual Value} \\ &= 0.944 - 0.789 \\ &= 0.155 \end{aligned}$$

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