

Homework Chapter 8

จากการคำนวณ

$$Gain(age) = Info(D) - Info_{age}(D) = 0.246$$

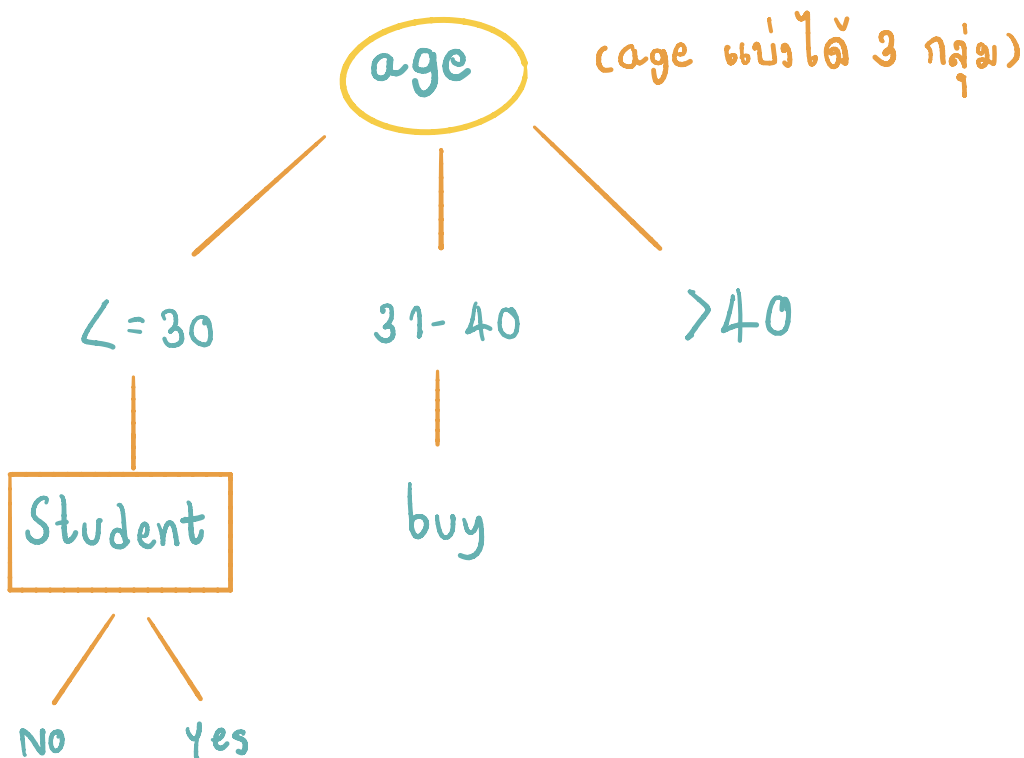
Similarly, we can get

$$Gain(income) = 0.029$$

$$Gain(student) = 0.151$$

$$Gain(credit_rating) = 0.048$$

- 1) เลือก root (จากค่า Gain ที่มากที่สุด)
คือ $Gain(age) = 0.246$



คำนวณ

$$= < 30 \rightarrow \text{Info}(D) = I \begin{matrix} Y & N \\ (2, 3) \end{matrix} = \boxed{-\frac{2}{5} \log_2 \frac{2}{5}} - \boxed{\frac{3}{5} \log_2 \frac{3}{5}}$$

(high) (medium) (low)

$$\bullet \text{Info income}(D) = \frac{2}{5} I(0, 2) + \frac{2}{5} I(1, 1) + \frac{1}{5} I(1, 0) \quad \text{↑ (Y, N)}$$

$$\bullet \text{Info student}(D) = \frac{2}{5} I \begin{matrix} \text{Yes} \\ (2, 0) \end{matrix} + \frac{3}{5} I \begin{matrix} \text{No} \\ (0, 3) \end{matrix}$$

$$\bullet \text{Info credit-rating}(D) = \frac{3}{5} I \begin{matrix} \text{fair} \\ (1, 2) \end{matrix} + \frac{2}{5} I \begin{matrix} \text{excellent} \\ (1, 1) \end{matrix}$$

$$31-40 \rightarrow \text{Info}(D) I \begin{matrix} Y & N \\ (4, 0) \end{matrix} = -\frac{4}{0} \log_2 \frac{4}{0} - \frac{0}{4} \log_2 \frac{0}{4}$$

$$\bullet \text{Info income}(D) = \frac{2}{4} I \begin{matrix} \text{(high)} \\ (2, 0) \end{matrix} + \frac{1}{4} I \begin{matrix} \text{(medium)} \\ (1, 0) \end{matrix} + \frac{1}{4} I \begin{matrix} \text{(low)} \\ (1, 0) \end{matrix}$$

$$\bullet \text{Info student}(D) = \frac{2}{4} I \begin{matrix} \text{(Yes)} \\ (2, 0) \end{matrix} + \frac{2}{4} I \begin{matrix} \text{(No)} \\ (2, 0) \end{matrix}$$

$$\bullet \text{Info credit-rating} = \frac{2}{4} I \begin{matrix} \text{fair} \\ (2, 0) \end{matrix} + \frac{2}{4} I \begin{matrix} \text{excellent} \\ (2, 0) \end{matrix}$$

$$>40 \rightarrow \text{Info}(D) I \overset{Y}{(3,2)} \overset{N}{=} -\frac{3}{5} \log_2 \frac{3}{5} - \frac{2}{5} \log_2 \frac{2}{5}$$

(medium) (low)

$$\bullet \text{Info income}(D) = \frac{3}{5} I(2,1) + \frac{2}{5} I(1,1)$$

(Yes)

(No)

$$\bullet \text{Info student}(D) = \frac{3}{5} I(2,1) + \frac{2}{5} I(1,1)$$

fair

excellent

$$\bullet \text{Info credit-rating} = \frac{3}{5} I(3,0) + \frac{2}{5} I(0,2)$$