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สสวทศ

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ห้จจจจ N = 12

age	income	student	credit_rating	buys_computer
<=30	high	no	fair	no
<=30	high	no	excellent	no
31...40	high	no	fair	yes
>40	medium	no	fair	yes
>40	low	yes	fair	yes
>40	low	yes	excellent	no
<=30	low	yes	fair	yes
>40	medium	yes	fair	yes
<=30	medium	yes	excellent	yes
31...40	medium	no	excellent	yes
31...40	high	yes	fair	yes
>40	medium	no	excellent	no

(p_i, n_i)

age income student credit_rating

2,2 3,3 6,1

3,0 4,1 5,1 2,3

3,2 2,1

I 1 1 1 0.5986

0 0.7219 0.2778 0.9704

0.9710 0.9183

$$\text{Info}(D) = (8,4) = -\frac{8}{12} \log_2 \left(\frac{8}{12} \right) - \frac{4}{12} \log_2 \left(\frac{4}{12} \right)$$

$$\text{Info}(D) = 0.9183$$

$$\text{ex} \quad I(p_i, n_i) = - \left(\frac{p_i}{p_i + n_i} \log_2 \frac{p_i}{p_i + n_i} + \frac{n_i}{p_i + n_i} \log_2 \frac{n_i}{p_i + n_i} \right)$$

$$\text{ex} \quad I(3,2) = - \left(\frac{3}{5} \log_2 \frac{3}{5} + \frac{2}{5} \log_2 \frac{2}{5} \right) = 0.9710$$

$$\text{Info}_{(\text{age})}(D) = \frac{4}{12} I(2,2) + \frac{3}{12} I(3,0) + \frac{5}{12} I(3,2) = 0.738$$

$$\text{Gain}(\text{age}) = \text{Info}(D) - \text{Info}_{(\text{age})}(D) = 0.9183 - 0.738 = 0.1803 \#$$

จากที่นี้

$$\text{Info}_{(\text{income})}(D) = \frac{4}{12} I(2,2) + \frac{3}{12} I(2,1) + \frac{5}{12} I(4,1) = 0.863$$

$$\text{Gain}_{(\text{income})} = 0.0553 \#$$

$$\text{Info}_{(\text{student})}(D) = \frac{6}{12} I(3,3) + \frac{6}{12} I(5,1) = 0.825$$

$$\text{Gain}_{(\text{student})} = 0.0933 \#$$

$$\text{Info}_{(\text{credit_rating})}(D) = \frac{7}{12} I(6,1) + \frac{5}{12} I(2,3) = 0.748$$

$$\text{Gain}_{(\text{credit_rating})} = 0.1703 \#$$

