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
[redacted]				
<=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

age

	y	n	sum
<=30	2	2	4
31-40	3	0	3
>40	3	2	5

student

	y	n	sum
NO	3	3	6
yes	5	1	6

Income

h	2	2	4
m	4	1	5
l	2	1	3

credit

f	6	1	7
e	2	3	5

ข้อมูล credit = 2

income = 2 entropy = 0.918

income m = 4 entropy = 0

income l = 3 entropy = 0

$$\text{class Info}(D) = \sum_{i=1}^{\tilde{} } p_i \log_2(p_i)$$

$$= I[8,4]$$

$$= -\frac{8}{12}\log_2\left(\frac{8}{12}\right) - \frac{4}{12}\log_2\left(\frac{4}{12}\right) = 0.918$$

Feature $\text{Info}_{age}(D) = \frac{4}{12}[1,1] + \frac{3}{12}[3,0] + \frac{5}{12}[3,2] = 0.809$

$\text{Info}_{income}(D) = \frac{4}{12}[2,2] + \frac{5}{12}[4,1] + \frac{3}{16}[2,1] = 0.932$

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

$\text{Info}_{credit}(D) = \frac{7}{12}[6,1] + \frac{5}{12}[2,5] = 0.747$

Gain at root node

Gain (age) = 0.918 − 0.809 = 0.109

Gain (income) = 0.918 − 0.932 = 0.086

Gain (std) = 0.918 − 0.815 = 0.093

Gain (credit) = 0.918 − 0.747 = 0.171

ถ้า credit = fair จะวิ่งตามลูกศรไปที่ yes

ถ้า credit = excellent และ income = high และวิ่งตามลูกศรไปที่ yes

credit

fair	excellent
no	no
yes	no
yes	yes
yes	yes
yes	no
yes	
yes	
yes	