yes = 9
no = 5

$Info(D) = I(9,5) = -\frac{9}{14}\log_2\frac{9}{14} - \frac{5}{14}\log_2\frac{5}{14} = 0.940$

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
31…40	low	yes	excellent	yes
<=30	medium	no	fair	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

age

age	buys_computer
<=30	no
<=30	no
31…40	yes
>40	yes
>40	yes
>40	no
31…40	yes
<=30	no
<=30	yes
>40	yes
<=30	yes
31…40	yes
31…40	yes
>40	no

	<=30	31…40	>40
yes	2	4	3
No	3	0	2

$Info_{age}(D) = \frac{5}{14} I(2,3) + \frac{4}{14} I(4,0) + \frac{5}{14} I(3,2)$

$= \frac{5}{14} I(3,2) = 0.694$

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

$= 0.940 - 0.694 = 0.246$

income

income	buys_computer
high	no
high	no
high	yes
medium	yes
low	yes
low	no
low	yes
medium	no
low	yes
medium	yes
medium	yes
medium	yes
high	yes
medium	no

	low	medium	high
yes	3	4	2
no	1	2	2

$Info_{income}(D) = \frac{4}{14} I(3,1) + \frac{6}{14} I(4,2) + \frac{4}{14} I(2,2)$

$= 0.911$

$Gain(income) = Info(D) - Info_{income}(D)$

$Gain(income) = 0.029$

student

student	buys_computer
no	no
no	no
no	yes
no	yes
yes	yes
yes	no
yes	yes
no	no
yes	yes
yes	yes
yes	yes
no	yes
yes	yes
no	no

	yes	no
yes	6	1
no	3	4

$Info_{student}(D) = \frac{7}{14} I(6,1) + \frac{7}{14} I(3,4) = 0.7885$

$Gain(student) = Info(D) - Info_{student}(D)$

$= 0.151$

Credit_rating

credit_rating	buys_computer
fair	no
excellent	no
fair	yes
fair	yes
fair	yes
excellent	no
excellent	yes
fair	no
fair	yes
fair	yes
excellent	yes
excellent	yes
fair	yes
excellent	no

	fair	excellent
yes	6	3
no	2	3

$Info_{credit}(D) = \frac{8}{14} I(6,2) + \frac{6}{14} I(3,3)$

$= 0.892$

$Gain(credit) = Info(D) - Info_{credit}(D)$

$= 0.048$

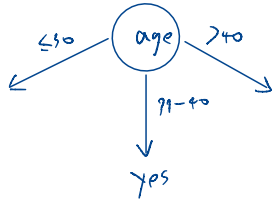
Root node

$Gain(age) = 0.246$

$Gain(income) = 0.029$

$Gain(student) = 0.151$

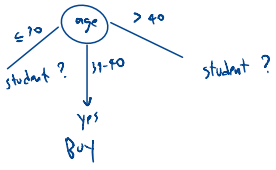
$Gain(credit) = 0.048$

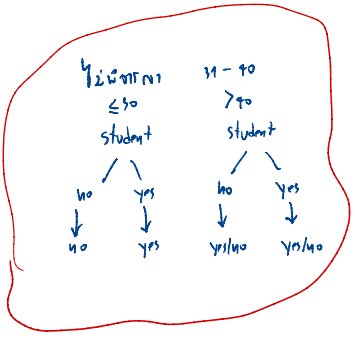


age > student > credit > income

student > Credit > income

age	student	buys_computer
<=30	no	no
<=30	no	no
[redacted]		
>40	no	yes
>40	yes	yes
>40	yes	no
[redacted]		
<=30	no	no
<=30	yes	yes
>40	yes	yes
<=30	yes	yes
[redacted]		
[redacted]		
>40	no	no





Info (D) = I (5,5) = 1

$Info_{\leq 30}(D) = \frac{2}{5}(2,0) + \frac{3}{5}(0,3) = 0$

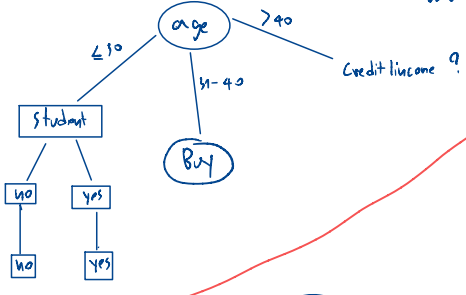
$Info_{>40}(D) = \frac{3}{5}(2,1) + \frac{2}{5}(1,1) = 0.951$

Gain (≤30) = 1 − 0 = 1

Gain (>40) = 1 − 0.951 = 0.049

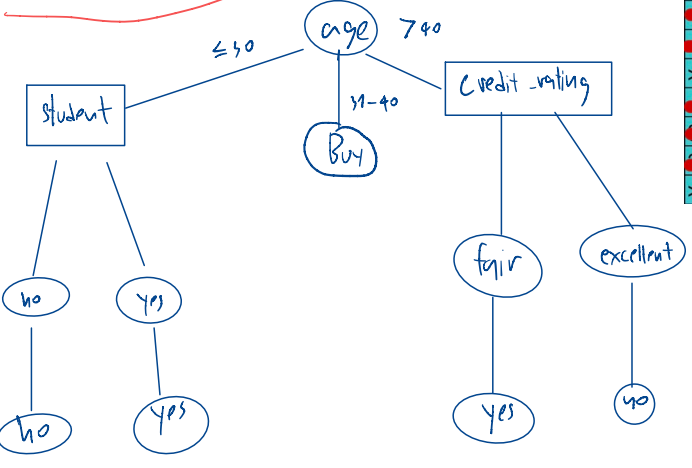
≤30 > >40

ข้อ ≤ 30



ซื้อกรณี Credit > income

age	income	student	credit_rating	buys_computer
[redacted]				
>40	medium	[redacted]	fair	yes
>40	low	[redacted]	fair	yes
>40	low	[redacted]	excellent	no
[redacted]				
[redacted]				
>40	medium	[redacted]	fair	yes
[redacted]				
[redacted]				
[redacted]				
>40	medium	[redacted]	excellent	no



$Info(D) = I(3,2) = -\frac{3}{5}\log_2\frac{3}{5} - \frac{2}{5} = 0.970$

$Info_{credit}(D) = \frac{3}{5}I(1,0) + \frac{2}{5}I(0,1) = 0$

$Info_{income}(D) = \frac{3}{5}I(2,1) + \frac{2}{5}(1,1) = 0.951$

Gain (credit) = 0.970 − 0 = 0.970

Gain (income) = 0.970 − 0.951 = 0.019

credit > income

เรียน credit