age	p_i	n_i	$I(p_i, n_i)$
<=30	2	3	0.971
31...40	4	0	0
>40	3	2	0.971

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

5/14

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

$$Info_{age}(D) = \frac{4}{12}I(2,2) + \frac{3}{12}I(3,0) + \frac{5}{12}(3,2) = 0.861$$

age	p_i	n_i	$I(p_i,n_i)$
<=30	2	2	0.33
31...40	3	0	0
>40	3	2	0.40

0.40496

$$Gain(age) = Info(D) - Info(age)$$
$$= 0.918 - 0.861$$
$$= 0.057$$

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income	p_i	n_i	$I(p_i,n_i)$
high	1	3	0.2704
medium	2	3	0.4046
low	3	0	

$Info_{income} =$