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

$$\text{Info}(D) = I(8,4) = -\frac{8}{12}\ln_2\left(\frac{8}{12}\right) - \frac{4}{12}\ln_2\left(\frac{4}{12}\right) = 0.9183$$

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

$$= \frac{4}{12}(1) + \frac{3}{12}(0) + \frac{5}{12}(0.971)$$

$$= 0.5761$$

$$I(2,2) = -\frac{2}{4}\ln_2\left(\frac{2}{4}\right) - \frac{2}{4}\ln_2\left(\frac{2}{4}\right) = 1$$

$$I(3,0) = -\frac{3}{3}\ln_2\left(\frac{3}{3}\right) - \frac{0}{0}\ln_2\left(\frac{0}{0}\right) = 0$$

$$I(3,2) = -\frac{3}{5}\ln_2\left(\frac{3}{5}\right) - \frac{2}{5}\ln_2\left(\frac{2}{5}\right) = 0.971$$

$$\text{Gain}(age) = \text{Info}(D) - \text{Info}_{age}(D) = 0.9183 - 0.5761 = 0.3422$$

$$\text{Info}_{income}(D) =$$

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