Income

Entrophy (income) = $-\sum_j p(j|income) \log_2 p(j|income)$

income	j = yes	j = no	$\log_2(j|income)$	n_i
low	3	1	0.811	4
medium	4	2	0.918	6
high	2	2	1	4

low: $-\frac{3}{4}\log_2\left(\frac{3}{4}\right) - \frac{1}{4}\log_2\left(\frac{1}{4}\right) = 0.811$

medium: $-\frac{4}{6}\log_2\left(\frac{4}{6}\right) - \frac{2}{6}\log_2\left(\frac{2}{6}\right) = 0.918$

high: $-\frac{2}{4}\log_2\left(\frac{2}{4}\right) - \frac{2}{4}\log_2\left(\frac{2}{4}\right) = 1$

$\therefore \frac{4}{14}(0.811) + \frac{6}{14}(0.918) + \frac{4}{14}(1) = 0.911$

\# $Gain_{split}$ (income) = 0.940 - 0.911 = 0.029

ถ้าแบบไม่ปัด

= 0.028937

Student

Entrophy (student) = $-\sum_j p(j|\text{student}) \log_2 p(j|\text{student})$

student	j = yes	j = no	$\log_2(j|\text{student})$	n_i
yes	6	1	0.592	7
no	3	4	0.985	7

yes: $-\frac{6}{7}\log_2\left(\frac{6}{7}\right) - \frac{1}{7}\log_2\left(\frac{1}{7}\right) = 0.592$

no: $-\frac{3}{7}\log_2\left(\frac{3}{7}\right) - \frac{4}{7}\log_2\left(\frac{4}{7}\right) = 0.985$

$\therefore \frac{7}{14}(0.592) + \frac{7}{14}(0.985) = 0.7885$

\# $\text{Gain}_{\text{split}}$ (income) = 0.940 - 0.7885 = 0.1515

คิดแบบไม่ปัด

= 0.15155

Credit_rating

Entrophy(credit_rating) = $-\sum_j p(j|\text{credit\_rating}) \log_2 p(j|\text{credit\_rating})$

credit_rating	j = yes	j = no	$\log_2(j|\text{credit\_rating})$	n_i
fair	6	2	0.811	8
excellent	3	3	1	6

yes: $-\frac{6}{8}\log_2\left(\frac{6}{8}\right) - \frac{2}{8}\log_2\left(\frac{2}{8}\right) = 0.811$

no: $-\frac{3}{6}\log_2\left(\frac{3}{6}\right) - \frac{3}{6}\log_2\left(\frac{3}{6}\right) = 1$

$\therefore \frac{8}{14}(0.811) + \frac{6}{14}(1) = 0.892$

\# $\text{Gain}_{\text{split}}(\text{income}) = 0.940 - 0.892 = 0.048$

ถ้าแบ่งแบบไม่ปัด

= 0.04784