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Section:3

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مركز: ٣

Ass

$\Rightarrow \text{Gain}(\text{income}, D):$

$D: S_y \in \{\text{high, low, medium}\}$ $\frac{S_y}{N} \text{entropy}(S_y)$

$= 0.940 - \frac{4}{14} \left(-\frac{2}{4} \log_2 \left(\frac{2}{4} \right) - \frac{2}{4} \log_2 \left(\frac{2}{4} \right) \right) -$

$\left(\frac{4}{14} \left(-\frac{3}{4} \log_2 \left(\frac{3}{4} \right) - \frac{1}{4} \log_2 \left(\frac{1}{4} \right) \right) - \frac{6}{14} \log_2 \left(\frac{4}{6} \right) - \frac{2}{8} \log_2 \left(\frac{2}{8} \right) \right)$

$= 0.029$

$\Rightarrow \text{Gain}(\text{Student}, D) = 0.940 - \frac{7}{14} \left(-\frac{6}{7} \log_2 \left(\frac{6}{7} \right) - \frac{1}{7} \log_2 \left(\frac{1}{7} \right) \right) -$

$\frac{7}{14} \left(-\frac{3}{7} \log_2 \left(\frac{3}{7} \right) - \frac{4}{7} \log_2 \left(\frac{4}{7} \right) \right) = 0.151$

$\Rightarrow \text{Gain}(\text{Credit-Rating}, D):$

$0.940 - \frac{8}{14} \left(-\frac{6}{8} \log_2 \left(\frac{6}{8} \right) - \frac{2}{8} \log_2 \left(\frac{2}{8} \right) \right) - \frac{6}{14} \left(-\frac{3}{6} \log_2 \left(\frac{3}{6} \right) - \frac{3}{6} \log_2 \left(\frac{3}{6} \right) \right) = 0.048$

AGE?

Youth middle Senior

Student Yes Credit-Rating

No Yes Fail Excellent

No Yes no Yes