

Cameron Bentz  
CSC-487

Lab 5

<u>dept</u>	<u>senior</u>	<u>junior</u>	<u>P<sub>senior</sub></u>	<u>P<sub>junior</sub></u>	<u>Info Dept</u>
sales	30	80	$\frac{30}{110}$	$\frac{80}{110}$	0.8454
systems	8	23	$\frac{8}{31}$	$\frac{23}{31}$	0.8238
marketing	10	4	$\frac{10}{14}$	$\frac{4}{14}$	0.8631
secretary	4	6	$\frac{4}{10}$	$\frac{6}{10}$	0.9710
TOTAL	52	113	$\frac{52}{165}$	$\frac{113}{165}$	0.8990

1. What is Info (D)?

$$\begin{aligned} \text{Info}(D) &= -P_{\text{senior}} \cdot \log_2(P_{\text{senior}}) - P_{\text{junior}} \cdot \log_2(P_{\text{junior}}) \\ &= -\frac{52}{165} \log_2\left(\frac{52}{165}\right) - \frac{113}{165} \cdot \log_2\left(\frac{113}{165}\right) \\ &= \boxed{0.20616} \quad \boxed{0.8990} \end{aligned}$$

2. What is Info (Department)?

$$\begin{aligned} \text{Info}(\text{sales}) &= -\frac{30}{110} \log_2\left(\frac{30}{110}\right) - \frac{80}{110} \log_2\left(\frac{80}{110}\right) \\ &= \boxed{0.8454} \end{aligned}$$

$$\begin{aligned} \text{Info}(\text{systems}) &= -\frac{8}{31} \log_2\left(\frac{8}{31}\right) - \frac{23}{31} \log_2\left(\frac{23}{31}\right) \\ &= \boxed{0.8238} \end{aligned}$$

$$\begin{aligned} \text{Info}(\text{marketing}) &= -\frac{10}{14} \log_2\left(\frac{10}{14}\right) - \frac{4}{14} \log_2\left(\frac{4}{14}\right) \\ &= \boxed{0.8631} \end{aligned}$$

$$\begin{aligned} \text{Info}(\text{secretary}) &= -\frac{4}{10} \log_2\left(\frac{4}{10}\right) - \frac{6}{10} \log_2\left(\frac{6}{10}\right) \\ &= \boxed{0.9710} \end{aligned}$$