- 贝叶斯判别计算实例

已知：$P(\omega_1)=0.2$，$P(\omega_2)=0.8$，

$P\ (x=$异常$|\omega_1)=0.6$，$P\ (x=$正常$|\omega_1)=0.4$，

$P\ (x=$异常$|\omega_2)=0.1$，$P\ (x=$正常$|\omega_2)=0.9$

利用贝叶斯公式，有：

$$P(\omega_1 \mid x=\text{异常}) = \frac{P(x=\text{异常} \mid \omega_1)P(\omega_1)}{P(x=\text{异常})}$$

$$= \frac{P(x=\text{异常} \mid \omega_1)P(\omega_1)}{P(x=\text{异常} \mid \omega_1)P(\omega_1)+P(x=\text{异常} \mid \omega_2)P(\omega_2)}$$

$$= \frac{0.6\times 0.2}{0.6\times 0.2+0.8\times 0.1} = 0.6$$

似然比：$l_{12} = \dfrac{P(\text{x}=\text{异常}|\omega_1)}{P(\text{x}=\text{异常}|\omega_2)} = \dfrac{0.6}{0.1} = 6$

判决阈值：$\theta_{21} = \dfrac{\text{P}(\omega_2)}{\text{P}(\omega_1)} = \dfrac{0.8}{0.2} = 4$

$l_{12} > \theta_{21}$，所以判断为第一类，即地震