

$M = \text{match}$
 $G = \text{guilty}$

$$P(G|M) = \frac{P(M|G) P(G)}{P(M)}$$

$$P(G) = 0.98$$

$$P(M|G) = \frac{P(M, G)}{P(G)} = \frac{0.01}{0.98} = 0.0102$$

$$P(M, \bar{G}) = P(M|\bar{G}) \cdot P(\bar{G}) = \frac{7999}{8000} \times 0.02 \\ = 0.0199925$$

$$P(M, G) + P(M, \bar{G}) = 0.0102 + 0.01999 \\ = 0.03$$