$P(A|B) = 0.71$, $(A|B^c) = 0.81$, $P(B) = 0.25$ what is $P(B|A)$?

Solution

According Bayes' rule

$$P(B|A) = \frac{P(A|B)P(B)}{P(A|B^c)P(B^c) + P(A|B)P(B)},$$

where $P(B^c) = 1 - P(B) = 1 - 0.25 = 0.75$.

Thus

$$P(B|A) = \frac{0.71 \cdot 0.25}{0.81 \cdot 0.75 + 0.71 \cdot 0.25} = 0.23.$$

Answer: 0.23.