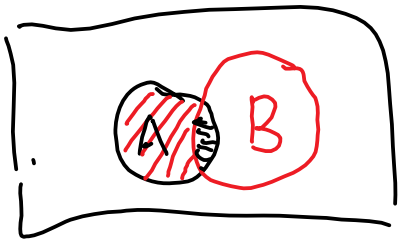
$A^c \cup A = S$, A^c and A are mutually exclusive

$P(A^c \cup A) = P(A^c) + P(A)$

$\Rightarrow P(S) = 1$

$\Rightarrow P(A^c) = 1 - P(A)$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$



$\Downarrow$

$P(B \cup (A \cap B^c))$

$= P(B) + P(A \cap B^c)$

$= P(B) + P(A) - P(A \cap B)$

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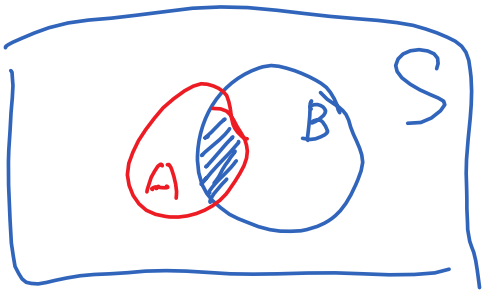
$P(A|B) = P(AB)/P(B)$ → # of samples in $A \cap B$ / # of samples in S

→ # of samples in B / # S

$$\frac{\#\text{ of samples in } A \cap B}{\#\text{ of samples in } B}$$



$P(A \cap B) \equiv P(AB) = 0.2 \times 0.1 = 0.02$

$P(A|B) = \frac{100}{300} = \frac{1}{3}$

# of defective = 100 + 200 = 300

$P(B) = \frac{P(AB)}{P(A|B)} = \frac{0.02}{1/3} = 0.06$