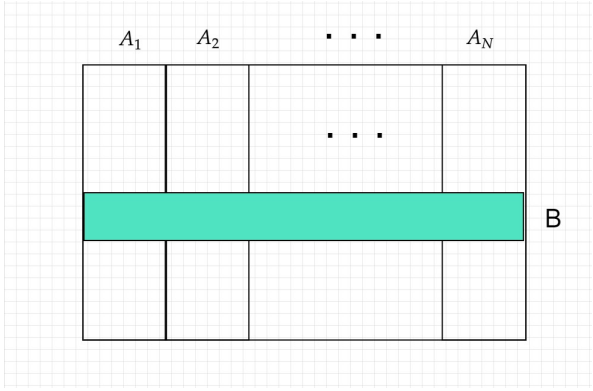
$$P(B) = \sum_{j=1}^{N} P(A_j)P(B|A_j)$$



$$n(B) = \sum_{j=1}^{N} n(B \text{ and } A_j)$$

$$P(B) = \sum_{j=1}^{N} \frac{n(B \text{ and } A_j)}{\sum_{j=1}^{N} n(A_j)}$$

$$P(A_j) = \frac{n(A_j)}{\sum_{j=1}^{N} n(A_j)}$$

$$P(B|A_j) = \frac{n(B \text{ and } A_j)}{n(A_j)}$$

$$P(B) = \sum_{j=1}^{N} \frac{n(A_j)}{\sum_{j=1}^{N} n(A_j)} \frac{n(B \text{ and } A_j)}{n(A_j)} = \sum_{j=1}^{N} \frac{n(B \text{ and } A_j)}{\sum_{j=1}^{N} n(A_j)}$$

$$\therefore\ P(B) = \sum_{j=1}^{N} P(A_j)P(B|A_j)$$