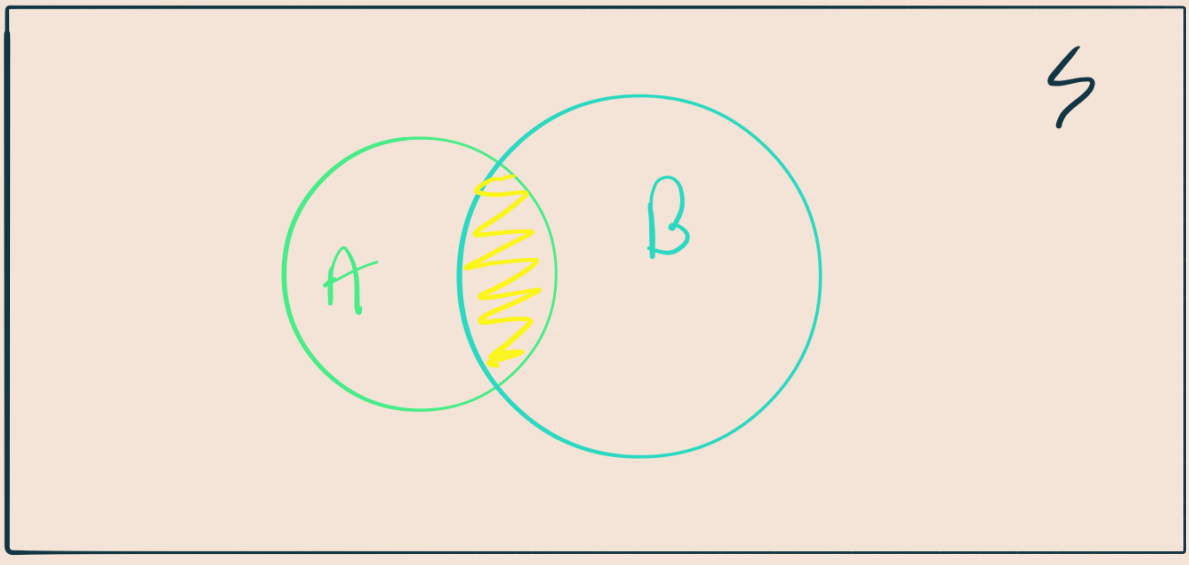
# * Independent Events:

→ Two events A, B are independent

if $P(A \cap B) = P(A) * P(B)$




$$P(A|B) = \frac{n(A \cap B)}{n(B)} \quad \cdots (1)$$

now,

$$P(A \cap B) = P(A) * P(B)$$

$$\Rightarrow P(A) = \frac{P(A \cap B)}{P(A)}$$

$$= \frac{\frac{n(A \cap B)}{n(S)}}{\frac{n(B)}{n(S)}}$$

$$\boxed{P(A) = \frac{n(A \cap B)}{n(B)}} \quad \cdots (ii)$$

From (i) and (ii)

$$P(A|B) = P(A)$$

It proves that A and B are independent. Here given B doesn't matter to A.

We can also prove that by another way.

$$P(A \cap B) = P(A) \times P(B) \quad \cdots (iii)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(A|B) = \frac{P(A) \times P(B)}{P(B)}$$

$$= P(A)$$