

Probability

independent

probability

Independence

Given A and B are independent events:

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

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

If A and B are independent to each other then

- \overline{A} and \overline{B} are independent
- \overline{A} and \overline{B} are also independent

Let's now consider a series of n independent events: E_1, E_2, \dots, E_n .

Probability that all events will occur:

$$P(E_1) * P(E_2) * \dots * P(E_n)$$

Probability that atleast one event will occur:

$$1 - P(\overline{E_1}) * P(\overline{E_2}) * \dots * P(\overline{E_n})$$

NOTE:- Can be derived using the inclusion exclusion principle. Calculate $P(E_1 \cup E_2 \cup \dots \cup E_n)$.