

Conditional probability

How can we calculate the result in a case where two events are not independent. It means that, if one event occurs it will directly affect the probability for the other event?

If event A and B are those kind of complex events which will not exclude each other. In this case we have a so-called conditional probability (event A affects event B).

Notation: $\text{p}(A | B)$

In this case we mean the relative frequency which compares the sum of all probability to the probability of event B (probability of its occurrence).

$$\text{p}(A|B) = \frac{\text{p}(AB)}{\text{p}(B)} = \frac{\text{p}(A \cap B)}{\text{p}(B)}$$

So we can get to the conclusion:

$$\text{p}(A \cap B) = \text{p}(A|B) \text{p}(B)$$

1.) $\text{p}(A \cap B)$: This represents the probability that both events A and B occur simultaneously. It is also known as the probability of the intersection of A and B.

2.) $\text{p}(A|B)$: This is the conditional probability of event A occurring given that event B has already occurred. It tells us how likely A is to happen under the condition that B has happened.

What the Formula Says?

The formula states that the probability of both events A and B occurring together, is equal to the probability of B occurring multiplied by the probability of A occurring given that B has already occurred.

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