Independent Events

In probability, events are independent if the outcome of one event does not affect the outcome of another. Given two events, A and B, independent, then the probability of A happening **AND** the probability of B happening is P(A) × P(B), therefore:

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

Example:

An inquiry was made regarding students' preferred payment methods. 50% of students use credit card, 40% resort to bank transfers and 20% use both payment methods. Determine if paying with credit card or bank transfer are independent events.

Considering event

A: paying with credit card and

B: paying though bank transfer,

we know that $P(A) = 0.5, P(B) = 0.4$ and $P(A \cap B) = 0.2$

If A and B are independent, then $P(A \cap B) = P(A) \times P(B) = 0.5 \times 0.4 = 0.2$, which is true.

So, we can confirm that A and B are independent events.

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