Basic Probability: Key Definitions and Rules

Two events are dependent if knowing that one will occur (or has occurred) changes the probability that the other occurs.

E.g. Event A: The roll of a die is odd (1, 3, 5);

Event B: The roll of a die is 1.

Event A and Event B are dependent.

The conditional probability of the event A, given that the event B has occurred or will occur, is the long-run relative frequency with which event A occurs when circumstances are that B has occurred or will occur. It is written as *P(A|B)*.

E.g. Event A: The roll of a die is odd (1, 3, 5);

Event B: The roll of a die is not 1.

P(A|B), or the probability of Event A given B means that given

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Rule 3a (general): *P(A and B) = P(A)P(B|A) = P(B)P(A|B)*

Rule 3b (for independent events): *If* A and B are *independent events,*

P(A and B) = P(A)P(B)

E.g. E.g. Event A: Roll a die, and the outcome is 1; P(A) = 1/6

Event B: Roll another die simultaneously, and the outcome is also 1. P(B) = 1/6

Because Event A and Event B are independent, P(A and B) (meaning that roll two dice simultaneously, and both outcomes are 2) = 1/6 * 1/6= 1/36

Extension of Rule 3b to more than two independent events: F 0 0 1 433.27457.15 Tm0 g0 G[G)]TJETQ

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Rule 4 (conditional probability):