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**Conditional Probability :**

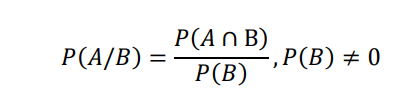
Let S be a sample space associated with the given random experiment.

Let A and B be any two events defined on the sample space S.

Then the probability of occurrence of event A under the condition that event B has already

occurred and P(B) ≠0 is called conditional probability of event A given B and is denoted by

P(A/B).



And P(A) = P(B)

**Multiplication theorem**

Let S be sample space associated with the given random experiment.

Let A and B be any two events defined on the sample space S.

Then the probability of occurrence of both the events is denoted by P(A∩B)

and is given by P(A∩B) = P(A).P(B/A)

**Independent Events**

Let S be sample space associated with the given random experiment.

Let A and B be any two events defined on the sample space S. If the occurrence of either

event, does not affect the probability of the occurrence of the other event, then the two events

A and B are said to be independent.

Thus, if A and B are independent events then,

P(A/B) = P(A/B') = P(A) and P(B/A) = P(B/A') = P(B)

If A and B are independent events then P(A∩B) = P(A).P(B)

(P(A∩B) = P(A).(B/A) = P(A).P(B) ∴ P(A∩B) = P(A).P(B))

If A and B are independent events then

a) A and B' are also independent event

b) A' and B' are also independent event

**Bayes Theorem**

Bayes' Theorem, named after 18th-century British mathematician Thomas Bayes, is a

mathematical formula for determining conditional probability. Conditional probability is the

likelihood of an outcome occurring, based on a previous outcome having occurred in similar

circumstances. Bayes' theorem provides a way to revise existing predictions or theories

(update probabilities) given new or additional evidence

• Bayes' Theorem allows you to update the predicted probabilities of an event by

incorporating new information.

• Bayes' Theorem was named after 18th-century mathematician Thomas Bayes.

• It is often employed in finance in calculating or updating risk evaluation.

• The theorem has become a useful element in the implementation of machine

learning.

• The theorem was unused for two centuries because of the high volume of calculation

capacity required to execute its transactions.

