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8. Baye's Theorem :-

It is a mathematical formula for determining conditional probability.

Conditional probability is the likelihood of an outcome occuring, based on a previous outcome occuring. Baye's Theorem provides a way to revise existing predictions or theories given new or additional evidence

Formula for Baye's Theorem:

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

$P(A)$ = probability of A occuring

$P(B)$ = probability of B occuring

$P(A/B)$ = probability of A occuring after the occurance of B.

$P(B/A)$ = probability of B occuring after the occurance of A.

$P(A \cap B)$ = Probability that both A & B occuring

10.

## prior probability

It is the probability of an event before new data is collected. This is the best rational assessment of the probability of an outcome based on the current knowledge before an experiment is performed

## posterior probability

It is revised or updated probability of an event occuring after taking into consideration new information. The posterior probability is calculated by updating the prior probability using Baye's theorem. The posterior probability is the probability of event A occuring given that event B has occured.

Given that probability of rain is 0.7, the probability of sun is 0.1 and the probability of rain & sun is 0.01

$$P(R|S) = P(R \cap S) / P(S)$$

$$= 0.01/0.1$$

$$= 0.1$$

probability of rain given the probability of sun = 0.1