Empirical Probability

It is a probability of event which is calculated based on experiments

\[
\text{Empirical Probability} = \frac{\text{No of trials which expected outcome came}}{\text{Total Number of trials}}
\]

Example:

A coin is tossed 1000 times; we get 499 times head and 501 times tail,

So empirical or experimental probability of getting head is calculated as

\[
p = \frac{499}{1000} = .499
\]

Empirical probability depends on experiment and different will get different values based on the experiment

(a) If the event A, B, C covers the entire possible outcome in the experiment. Then,
\[
P(A) + P(B) + P(C) = 1
\]

(b) The probability of an event (U) which is impossible to occur is 0. Such an event is called an impossible event
\[
P(U) = 0
\]

(c) The probability of an event (X) which is sure (or certain) to occur is 1. Such an event is called a sure event or a certain event
\[
P(X) = 1
\]

(d) Probability of any event can be as

\[
0 \leq P(E) \leq 1
\]