# Classical probability of favorable outcomes 

Science, Mathematics

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## Classical Probability of Favorable Outcomes

Classical probability is the number of favorable outcomes over the total number of outcomes while empirical probability is the number of times an event happened over the total number of trials. Classical probability is only true if each outcome is equally likely to occur, but empirical is predicting the possibility that an outcome will occur. This simply means that, more often that not, solving empirical probability would entail doing an experiment. And classical probability can be solved by simply basing on given facts. An experiment was done using 20 coins. The number of heads and tails for each trial is listed below.

Trial
Number of heads
Number of Tails

1

8
12

2

7
13
3

11

9

4
12

8

For example, on the first trial, we want to get the observed probability of tossing a head. We can solve the probability by dividing the number of heads occurred by the total number of coins. That is,

Probability of having a head $===$
Furthermore, in getting the observed probability of tossing a tail still on the first trial, this would be

Probability of having a tail $===$

In addition to, based on the given trials, we cannot get a probability of $1 / 2$ for both heads or tails since we have not get an equal number of heads or tails on any of the trials. Since we did an experiment in finding the probability of an event occurring, the probability used is empirical probability. Let us consider getting the average probability of getting a head for the whole trials. Specifically, it is the average number of head over the total number of coins used.

Average number of heads:
Average Probability of tossing a head $=$
As we can notice, the average probability is nearer the expected probability which is $1 / 2$.

The sample space for the outcomes for tossing three coins having H for heads and $T$ for tails are $\{H H H\},\{H H T\},\{H T H\},\{H T T\},\{T H T\},\{T \mathrm{H}\}$, \{THH\}, and \{TTT\}. Actually, we do not need actual coins to further compute the probability since the sample outcomes are already given to be true. Further, the probability for each outcome to happen is $1 / 8$. Hence, since it has been assumed that the given outcomes are true, we are using the classical probability.

