11.16.3.2

EE24BTECH11001 - Aditya Tripathy

Question:
A coin is tossed twice, what is the probability that atleast one tail occurs?
Solution:
The sample space is

$$\Omega = [HH, HT, TH, TT] \tag{0.1}$$

Assuming equally likely outcomes,

$$\Pr(\omega \in \Omega) = \frac{1}{4} \tag{0.2}$$

Define a discrete random variable X = number of tails in the sequence.

$$\Pr(X \geq 1) = 1 - \Pr(X < 1) \tag{0.3}$$

$$= 1 - \frac{1}{4} = \frac{3}{4} \tag{0.4}$$

Simulation: The following shows how the relative frequency reaches true probability with increasing number of trials of the event.

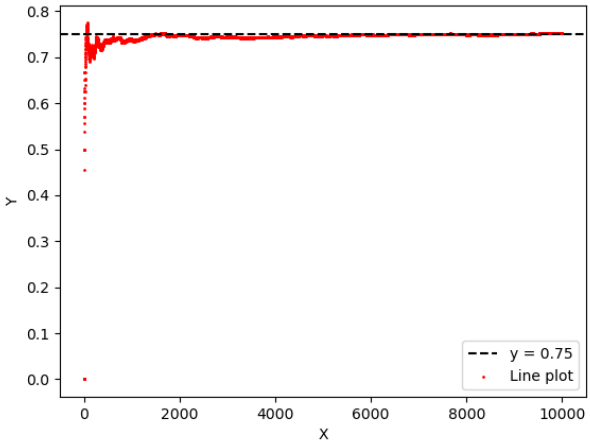

Fig. 0.1: Relative Frequency tends to True Probability