Assignment

Karthikeya hanu prakash kanithi (EE22BTECH11026)

Question : A single letter is selected at random from the word 'PROBABILITY'. The probability that it is a vowel is

Solution: Let X be an bernoulli rv defined as in Table I,

RV	Value	Description
X	0	Selection of non-vowels
	1	Selection of vowels

TABLE I
RANDOM VARIABLE X DECLARATION.

Where,

$$n = 1 \quad p = \frac{4}{11} \tag{1}$$

The probabilities are as follows:

$$p_X(k) = {}^1C_k \left(\frac{4}{11}\right)^k \left(\frac{7}{11}\right)^{1-k}, \forall k \in [0, 1] \tag{2}$$

From Table I and (2), The probability that the selected letter is a vowel is given by:

$$p_X(1) = {}^1C_1 \left(\frac{4}{11}\right)^1 \left(\frac{7}{11}\right)^0 \tag{3}$$

$$= \frac{4}{11} \tag{4}$$

Therefore, the probability that the selected letter is a vowel is $\frac{4}{11}$.

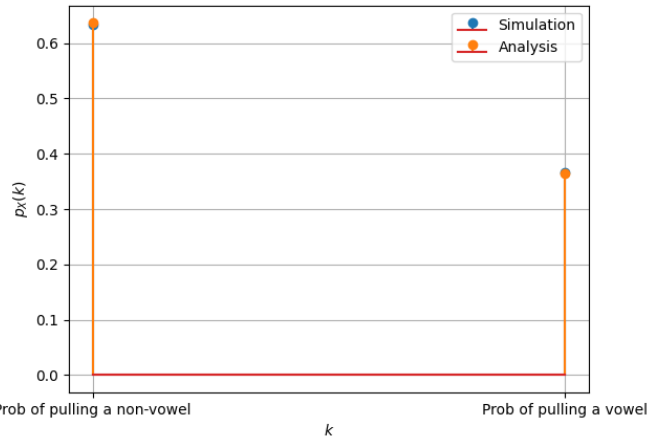

Fig. 1. Theoritical and practical values of probability