Assignment 7

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Download all python codes from

https://github.com/cmapsi/AI1103−Probability−and−random−variables/tree/main/Assignment−7/codes

and latex-tikz codes from

https://github.com/cmapsi/AI1103−Probability−and−random−variables/blob/main/Assignment−7/main.tex

1 Problem

(GATE ME-2014 Q 4-ME section) A box contains 25 parts of which 10 are defective. Two parts are being drawn simultaenously in a random manner from the box. The probability of both parts being good is

$(A)\frac{7}{20}$ $(B)\frac{42}{125}$ $(C)\frac{25}{29}$ $(D)\frac{5}{9}$

2 solution

Let $X_1, X_2 \in \{0, 1\}$ represent the parts, where 0 represents good part, 1 represent defective part. From the given information

$$\Pr(X_1 = 0) = \frac{15}{25} = \frac{3}{5} \tag{2.0.1}$$

$$\Pr(X_2 = 0|X_1 = 0) = \frac{14}{24} = \frac{7}{12} \tag{2.0.2}$$

Then,

$$\Pr(X_1 = 0, X_2 = 0)$$
$$= \Pr(X_2 = 0|X_1 = 0) \times \Pr(X_1 = 0) = \frac{7}{20} \tag{2.0.3}$$

The graph for theoretical result vs simulation is given below

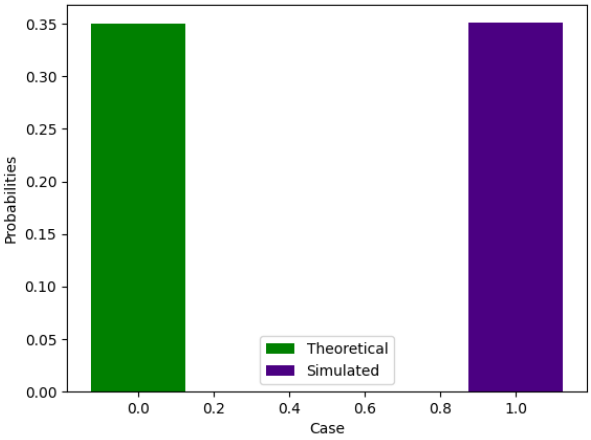

Fig. 0: Theoretical vs simulation