AI5002: Assignment 10

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Download all Python codes from

https://github.com/Debolena/AI5002−Probability−and−Random−Variables/blob/main/Assignment_10/python_boy_girl.py

and latex-tikz codes from

https://github.com/Debolena/AI5002−Probability−and−Random−Variables/blob/main/Assignment_10/latex_code.tex

1 Problem

Prob.Misc-5.22 :
There are 40 students in Class X of a school of whom 25 are girls and 15 are boys. The class teacher has to select one student as a class representative. She writes the name of each student on a separate card, the cards being identical.Then she puts cards in a bag and stirs them thoroughly. She then draws one card from the bag. What is the probability that the name written on the card is the name of

1) a girl?
2) a boy?

2 Solution

Let X be the random variable that denotes the chosen name is a boy or girl. Let 0 represents a boy's name and 1 represent girl's name.
Then, $X \in \{0, 1\}$
Probability of choosing a card that contains a girl's name is

$$P(X = 1) = \frac{25}{40} \tag{2.0.1}$$

$$= \frac{5}{8} \tag{2.0.2}$$

Probability of choosing a card that contains a boy's name is

$$P(X = 0) = \frac{15}{40} \tag{2.0.3}$$

$$= \frac{3}{8} \tag{2.0.4}$$

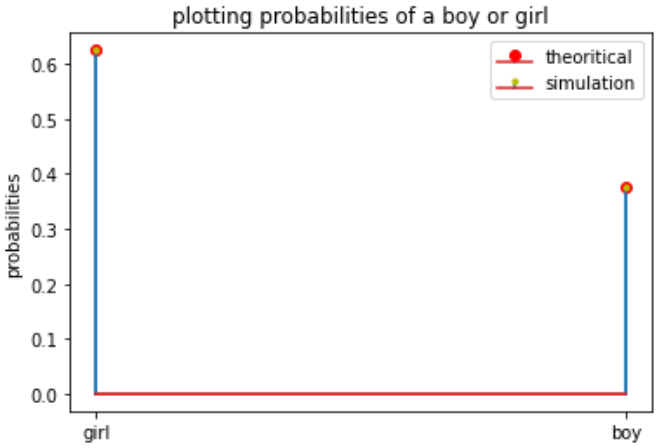

Fig. 2: Actual Vs Simulated Plot