Assignment 2

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TABLE 2

Type of shirt	X	number
good	0	n(X=0) = 88
minor defect	1	n(X=1) = 8
major defect	2	n(X=2) = 4

Download all python codes from

https://github.com/Adarsh541/AI1103−prob−and−ranvar/blob/main/Assignment2/codes/assignment1.py

and latex-tikz codes from

https://github.com/Adarsh541/AI1103−prob−and−ranvar/blob/main/Assignment2/Assignment1.tex

PROBLEM(5.19)

A carton consists of 100 shirts of which 88 are good,8 have minor defects and 4 have major defects.Jimmy,a trader,will only accept the shirts which are good,but Sujatha,another trader,will only reject the shirts which have major defects.One shirt is drawn at random from the carton.What is the probability that

  i) it is acceptable to jimmy?
  ii) it is acceptable to Sujatha?

SOLUTION(5.19)

Let random variable $X \in \{0, 1, 2\}$ denote the outcomes of experiment of drawing a shirt from the carton as shown in Table 2 From the given information,

$$n(X = 0) + n(X = 1) + n(X = 2) = 100 \quad (0.0.1)$$

$$\Pr(X = 0) = \frac{n(X = 0)}{100} = \frac{88}{100} \quad (0.0.2)$$

$$\Pr(X = 1) = \frac{n(X = 1)}{100} = \frac{8}{100} \quad (0.0.3)$$

$$\Pr(X = 2) = \frac{n(X = 2)}{100} = \frac{4}{100} \quad (0.0.4)$$

i) Since Jimmy accepts only good shirts.Probability that the shirt drawn is acceptable to Jimmy is equal to probability of drawing a good shirt from the carton.So the required probability is

$$p = \Pr(X = 0) \quad (0.0.5)$$

$$= \frac{88}{100} \quad (0.0.6)$$

$$= 0.88 \quad (0.0.7)$$

ii) Sujatha rejects major defect shirts.So she accepts both good shirts and minor defect shirts.Probability that the shirt drawn is acceptable to Sujatha is equal to the sum of probability of drawing good shirt and probability of drawing minor defect shirt.So the required probability is

$$p = \Pr(X = 0) + \Pr(X = 1) \quad (0.0.8)$$

$$= \frac{88}{100} + \frac{8}{100} \quad (0.0.9)$$

$$= 0.96 \quad (0.0.10)$$

plot of theoretical probability