AI1103: Assignment 1

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Download all python codes from

https://github.com/ASHWITHA-11008/Assignment-1/blob/main/assignment_1%20(2).py

and latex-tikz codes from

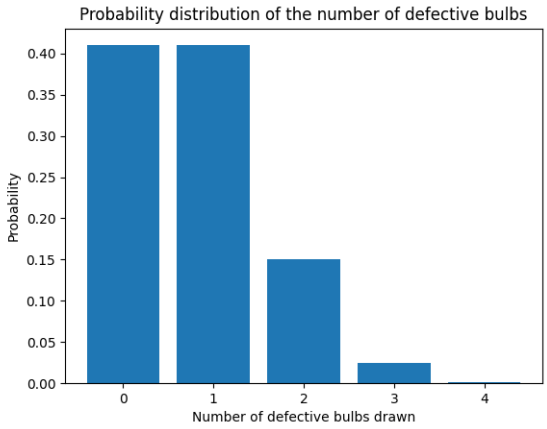
https://github.com/ASHWITHA-11008/Assignment-1/blob/main/Assignment_1%5B1%5D.tex

Question-1.13
From a lot of 30 bulbs which include 6 defectives, a sample of 4 bulbs is drawn at random with replacement. Find the probability distribution of the number of defective bulbs.

Solution:
Given 30 bulbs which include 6 defectives and 4 bulbs are drawn at random with replacement.

Let us assume a random variable X:
X=Number of defective bulbs drawn.
p=probability of drawing a defective bulb.
q=1-p

Binomial distribution:
$P(X) = {}^{n}C_{x} \times (p^{x}) \times (q^{n-x})$



$$P(X=0) = 1 \times \frac{24^4}{30^4} = 0.409$$
$$P(X=1) = 4 \times \frac{6}{30} \times \frac{24^3}{30^3} = 0.409$$
$$P(X=2) = 6 \times \frac{6^2}{30^2} \times \frac{24^2}{30^2} = 0.154$$
$$P(X=3) = 4 \times \frac{6^3}{30^3} \times \frac{24}{30} = 0.02$$
$$P(X=4) = 1 \times \frac{6^4}{30^4} = 0.016$$