

BINOMIAL DISTRIBUTION

→ If we repeat 'n' Bernoulli trials in an experiment
Then that random variable is called Binomial Random Variable

→ For Binomial, 'p' is constant across all the trials.

→ Each trial is independent on another trial.

We derived the probability mass function for this distribution is

$$P(X=r) = {}^nC_r (p)^r (q)^{n-r} \quad \text{where} \quad {}^nC_r = \frac{n!}{(n-r)!r!}$$

$$E(X) = np$$

$$V(X) = np(1-p)$$

Based on the Situations/Scenarios we need to understand what are probabilities is required to calculate i.e either

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|------------|---|---------------|
| ① Exactly | → | $P(X=r)$ |
| ② At least | → | $P(X \geq r)$ |
| ③ At most | → | $P(X \leq r)$ |