AIM 2

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① Probability is a measure of likelihood that an event will occur. It is expressed as a number between 0 and 1.

$$P(A) = \frac{\text{No. of favourable outcomes}}{\text{Total Possible outcomes.}}$$

② i) classical Approach
ii) Statistical Approach
iii) Axiomatic Approach

③ Discrete :- Take countable values
$P(x=x) > 0$ some x

Continuous :- Takes uncountable values
$P(x=a) = 0$ for all x

④ i) Medical Diagnosis
ii) Spam Filtering
iii) Machine learning

(5) PMF: Sum of all possible values is 1

$$\sum P(x = x) = 1$$

(6) A Bernoulli trial is random experiment with exactly two possible outcomes.

(7)

$$P(x = \lambda) = \binom{n}{k} p^k (1-p)^{n-k}$$

$$P(x = k) = \frac{e^{-d} d^k}{k!}, \quad d = np$$

(8) Binomial:- mean = np variance = np(1-p)

Poision:- mean = d variance = d

(9) Poission:- Mean:- $E(\lambda) = d$

Variance:- $\text{var}(\lambda) = d$.

(10) CDF of random variable x gives probability that x takes a value of less than x.