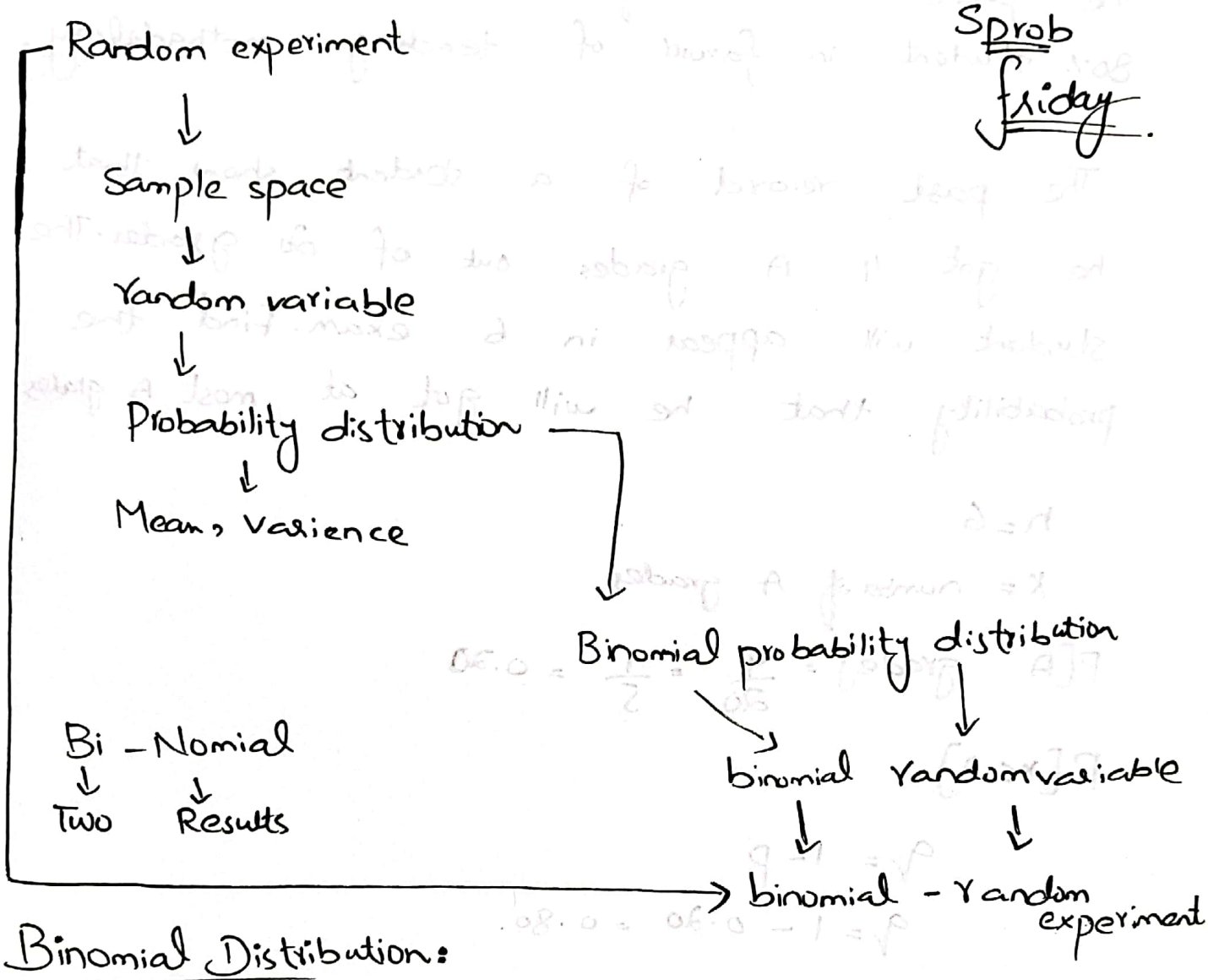
15.12.2023

Sprob

Friday.



Binomial Distribution:

A random variable x has binomial distribution if it has the probability function.

$$b(X : \underbrace{n, p}_{\text{parameters}}) = \binom{n}{x} p^x q^{n-x}, \quad x = 0, 1, 2, 3 \ldots, n$$

where

X : number of success outcomes

n : number of trail (sample size)

p : probility of success outcomes in a single trail.

$q = 1 - p$: probility of failure outcomes.

Example:-

The past feedback of an instructor shows that 80% student in favour of teaching methadology.

The past record of a student show that he got 4 A grades out of 20 grades. The student will appear in 6 exam. Find the probability that he will got at most A grades

$n = 6$

X = number of A grades

$P[\text{A grade}] = \frac{4}{20} = \frac{1}{5} = 0.20$

$P[X \leq 2]$

$q = 1 - P$

$q = 1 - 0.20 = 0.80.$

$X \sim b(n, p)$

$b(x; \overset{n}{6}, \overset{p}{0.20}) = \binom{6}{x}(0.20)^x (0.80)^{6-x}$

$P[X \leq 2] = \sum_{x=0}^{2} \binom{6}{x}(0.20)^x (0.80)^{6-x}$