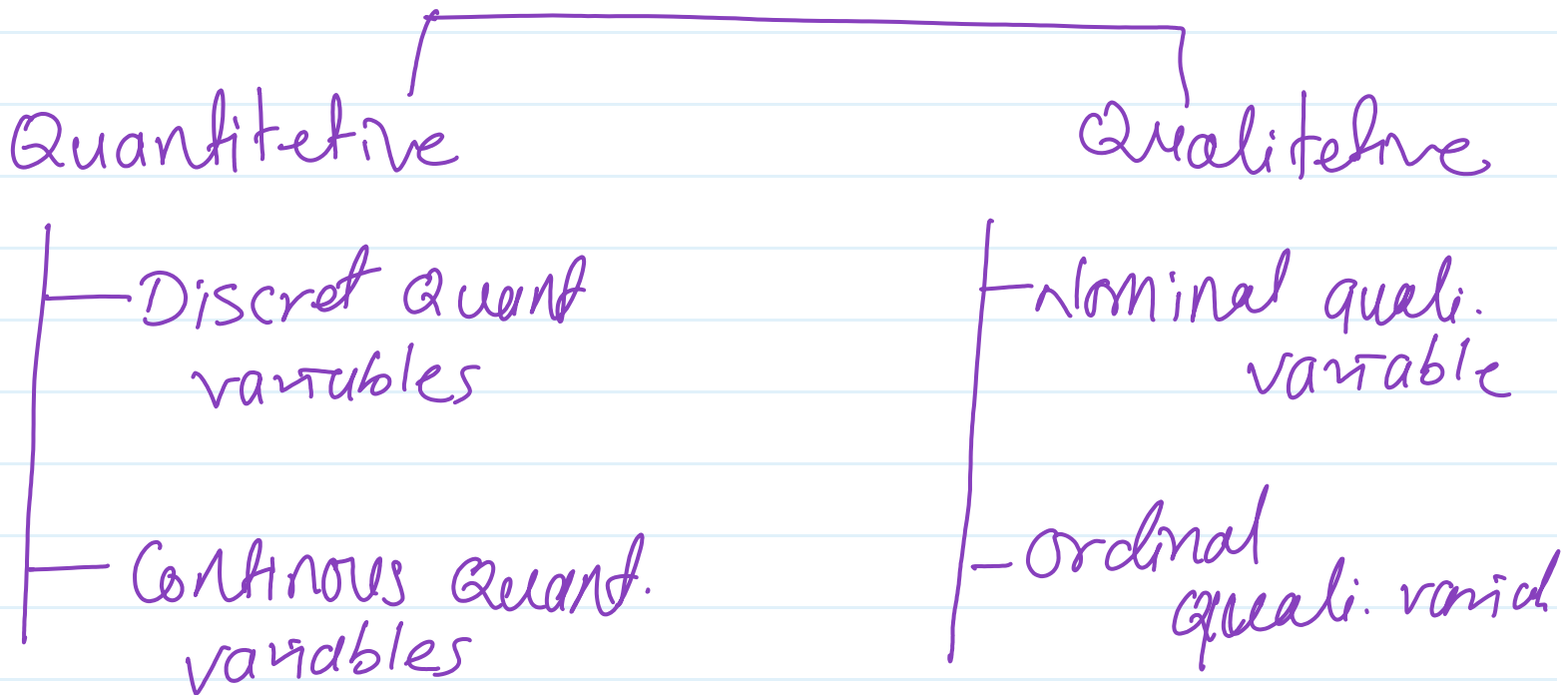


* Variables

X

Type of Variable



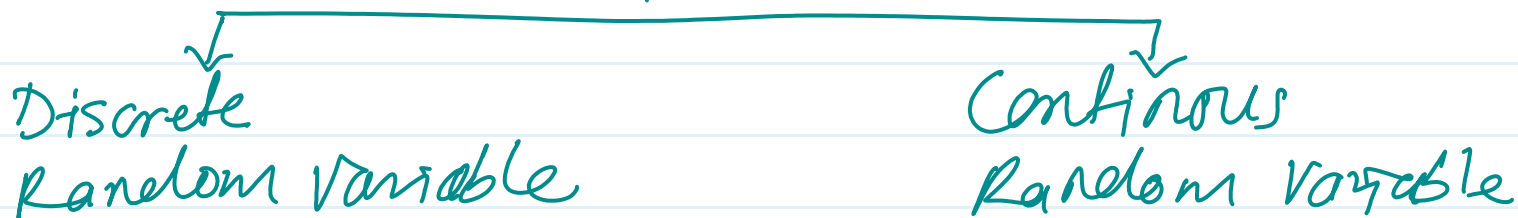
* Random variable

Y

$$Y = \text{Rain} [$$

$$Y = \text{Coin } C_7^H$$

Type of Random Variable



Eg:- coin, dice,
Result,

Eg:- Rain, height,

* Probability

It is the likelihood of the event

Probability always b/w 0 to 1

$$\text{probability} = \frac{\text{no of ways it can happen}}{\text{Total no. of outcome}}$$

Eg:- Toss a coin

$$P_{\text{coin}} = \frac{1}{2}$$

$$P_{\text{dice}} = \frac{1}{6}$$

Type of probability

- ① mutually Exclusive
- ② non-mutually Exclusive

① mutually Exclusive :-

The event where the probability to come 1 outcome.

Eg:- coin = H/T

Dice = 1/2/3/4/5/6

Result = pass (fail

= T/F





Gender = M/F/T

② non-mutually Exclusive -

The event where probability of outcome will be more than one.

Eg!: Deck of card

$$P(\text{King}) = \frac{4}{52}$$

King and , , , 

* Rule of probability

① Additive rule of prob.

② multiplicative rule of prob.

① Additive rule of prob. -

1st-type $P(A \text{ or } B) = P(A) + P(B)$

Eg!: Dice 2 and 5 prob.

$$P(2 \text{ or } 5) = P(2) + P(5)$$

$$= \frac{1}{6} + \frac{1}{6}$$

$$= \frac{2}{6} = \frac{1}{3} = 33.33\%$$

2nd-type card king and of prob.

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(K \text{ or club}) = P(K) + P(\text{club}) - P(K \text{ and club})$$

$$= \frac{4}{52} + \frac{13}{52} - \frac{1}{52}$$

$$= \frac{16}{52}$$

$$P(K \text{ or club}) = \frac{4}{13}$$

② multiplicative rule of prob:-

① Independent event:-

no of outcome will not reduce.

$$P_{\text{com}} = P(H) \times P(T) \times P(T)$$

$$= \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$$

$$= \frac{1}{8}$$

② Dependent event :- no of outcome will reduce.

Eg. Prob. 3 king

$$P(K) = P_1(K) \times P_2(K) \times P_3(K)$$

$$= \frac{4}{52} \times \frac{3}{51} \times \frac{2}{50}$$

$$= \frac{24}{132600} \Rightarrow \underline{\underline{\frac{1}{5525}}}$$

* Permutation

eg:- In a school trip 50 students facing 6 different chocolate.

[Dm, KK, Perk, munch, KT, 5 stars]
picking three chocolate.

n = # of object

r = # of object picking

$${}_n P_r = \frac{n!}{(n-r)!}$$

$$= \frac{6!}{(6-3)!}$$

$$= \frac{6 \times 5 \times 4 \times \cancel{3} \times \cancel{2} \times \cancel{1}}{\cancel{3} \times \cancel{2} \times \cancel{1}}$$

$$= 120$$

4 Combination

$$n = 6$$

$$r = 3$$

$${}^nC_r = \frac{n!}{r!(n-r)!}$$

$$= \frac{6!}{3!(6-3)!}$$

$$= \frac{\cancel{2} \times \cancel{3} \times 4 \times \cancel{5} \times \cancel{2} \times 1}{\cancel{3} \times \cancel{2} \times 1 \times \cancel{3} \times \cancel{2} \times 1}$$

$$\Rightarrow 20$$