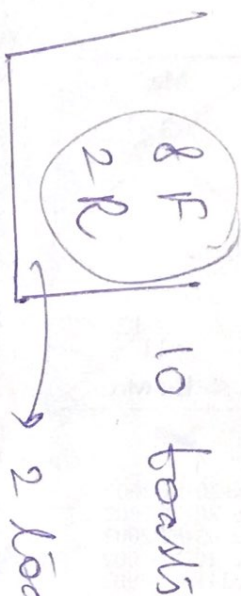


BAYE'S Theorem

RANDOM VARIABLE : \rightarrow



\rightarrow 2 loaves randomly

X : no. of Rotten loaves

$X = 0, 1, 2$

discrete \rightarrow

$$P(X=0) = \frac{8 \cdot 7}{10 \cdot 9} = \frac{8C_2}{10C_2} = \frac{8 \cdot 7}{10 \cdot 9} = \frac{56}{90}$$

$$P(X=1) = P(\text{one rotten } \& \text{ one fresh}) = \frac{8 \cdot 2}{10 \cdot 9} = \frac{8C_1 \cdot 2C_1}{10C_2} = \frac{8 \cdot 2}{10 \cdot 9} = \frac{16}{45}$$

$$P(X=2) = P(\text{both rotten}) = \frac{2 \cdot 1}{10 \cdot 9} = \frac{2C_2}{10C_2} = \frac{1}{45}$$

$$P(X) : \begin{matrix} 0 & 1 & 2 \\ \frac{56}{90} & \frac{32}{90} & \frac{2}{90} \end{matrix} \quad \frac{1}{\frac{10 \cdot 9}{2 \cdot 1}} = \frac{2}{90}$$

500 students

$$n(172 \leq X \leq 184)$$

mean - integral height. $\frac{\text{cont.}}{d.v.}$

3000

Avg life = 1240 hrs.

$$P(X > 1500)$$

life of light bulb

$$1500 \leq X \leq 1600$$

$$n_{C_n} = 1$$

$$n_{C_1} = n_{C_{n-1}}$$

Random draw ✓

Replacement

3 cards, one by one without

X: no of Black cards

X = 0, 1, 2, 3

$$P(X=0) = P(\text{no black card})$$

$$(RRR) = \frac{26}{52} \times \frac{25}{51} \times \frac{24}{50} = \frac{15600}{132600} = \frac{15600}{132600}$$

$$P(X=3) = \frac{26}{52} \times \frac{25}{51} \times \frac{24}{50}$$

$$P(X=1)$$

$$\begin{matrix} RRR \\ RRR \\ RRR \end{matrix}$$

$$= 3 \times \frac{26}{52} \times \frac{26}{51} \times \frac{25}{50} = \frac{50700}{132600}$$

X:	0	1	2	3
P(X):	$\frac{15600}{132600}$	$\frac{50700}{132600}$	$\frac{50700}{132600}$	$\frac{15600}{132600}$

$$P(X=2)$$

$$\begin{pmatrix} BBR \\ BBR \\ BBR \\ RRR \end{pmatrix}$$

$$= 3 \times \frac{26}{52} \times \frac{25}{51} \times \frac{26}{50}$$

$$+ \frac{26}{52} \times \frac{26}{51} \times \frac{26}{50}$$

$$+ \frac{26}{52} \times \frac{26}{51} \times \frac{25}{50}$$

$$= \frac{50700}{132600}$$



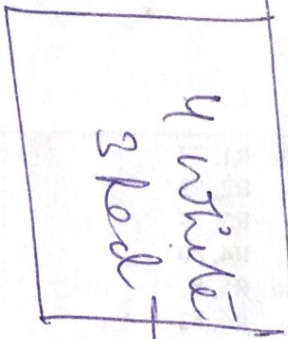
randomly

P.D of no. of Aces?

X: no. of Aces

X = 0, 1, 2

$$P(\text{no Ace}) \leftarrow P(X=0) = \frac{{}^{48}C_2}{{}^{52}C_2}$$



→ 3 balls are drawn, with replacement

P.D of no. of Red Balls??

X: no of Red Balls

X = 0, 1, 2, 3