

Statistics Test:

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- 1) Sample = 52 cards (without replacement)
[3 cards Drawn]

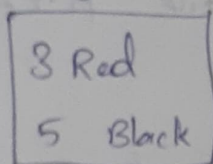
Probability (one Diamond, one heart, one spade)

$$= P(\text{Diamond}) \times P(\text{heart}) \times P(\text{spade})$$

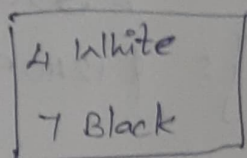
$$= \frac{13}{52} \times \frac{13}{51} \times \frac{13}{50} = \frac{169}{10200}$$

$$\text{Probability} = \frac{169}{10200}$$

- 3) Bag A



- Bag B



$$P(A) = P(B) = \frac{1}{2}$$

$$P(A, B) = \frac{5}{8}$$

$$P(B, B) = \frac{7}{11}$$

$$P(\text{Black}) = P(A \cap B) + P(B \cap B)$$

$$\text{(or)} = \frac{1}{2} \times \frac{5}{8} + \frac{1}{2} \times \frac{7}{11}$$

$$P(B) = \frac{1}{2} \left[\frac{5}{8} + \frac{7}{11} \right] = \frac{1}{2} \left[\frac{55 + 56}{88} \right]$$

$$= \frac{1}{2} \left[\frac{111}{88} \right]$$

$$\frac{P(B)}{P(B)} = \frac{P(B \cap B)}{P(B)} = \frac{\frac{1}{2} \times \frac{7}{11}}{\frac{1}{2} \times \frac{111}{88}} = \frac{7}{11} \times \frac{88}{111}$$

$$P\left(\frac{B}{\text{Black}}\right) = \frac{56}{111} \quad \text{(or)} \quad 0.5045$$

- 2) action movies = 42%

Comedy movies = 54%

Drama movies = 36%

Horror movies = 12%

Total = 144

$$(a) \text{ Probability (action or Drama) } = P(\text{action}) + P(\text{drama})$$

$$= \frac{42}{144} + \frac{36}{144} = \frac{78}{144}$$

$$\text{Probability (action or Drama)} = \frac{78}{144}$$

$$(b) \text{ Probability (comedy or Horror) } = P(\text{comedy}) + P(\text{Horror})$$

$$= \frac{54}{144} + \frac{12}{144} = \frac{66}{144}$$

b) 75th percentile value = ?

$$\text{average} = \$ 350870$$

$$\text{Standard Deviation} = \$ 12405$$

$$\text{Percentile} = \mu + z\sigma$$

$$\text{percentile value} = \text{average} + (z \times \text{Standard deviation})$$

where $z \Rightarrow z$ table value.

$$(z \text{ value for } 75^{\text{th}} \text{ percentile} = 0.67)$$

$$= 350870 + (0.67 \times 12405)$$

$$= 350870 + 8311.35$$

$$75^{\text{th}} \text{ percentile value} = 359181.35$$

4) 450 applicants in 1 hour by Poisson distribution.

$$(a) \lambda = \frac{450}{60} = \frac{15}{2}$$

$$\boxed{n=10}$$

$$P(n=x) = e^{-15/2} \cdot \frac{(15/2)^{10}}{10!}$$

$$= 0.0858$$

$$(b) P(X \leq x) = \frac{e^{-15/2} \cdot (15/2)^7}{17!}$$

$$\approx 0.6321.$$