19/4/22

Kaviya K.K
19BCS4056

IMARTICUS

ASSESSMENT

STATISTICS AND PROBABILITY

1) Cards = 52

Diamond = 13
Heart = 13
Spade = 13

$$\text{Required Probability} = \frac{{}^{13}C_1 \times {}^{13}C_1 \times {}^{13}C_1}{{}^{52}C_3}$$

$$= \frac{13 \times 13 \times 13}{52 \times 51 \times 50} = \frac{2197}{132600}$$

$$= 0.016$$

The Probability of getting one card is diamond, one card is heard and one card is spade } = 0.016

2) Given

P(A) = Action movies = 42% ⇒ 42/100
P(B) = Comedy movies = 54% ⇒ 54/100
P(C) = Drama movies = 36% ⇒ 36/100
P(D) = horror movies = 12% ⇒ 12/100

Total Probability = P(A) + P(B) + P(C) + P(D)

$$= \frac{42 + 54 + 36 + 12}{\text{common}}$$

= 144/100

Total Probability = 144

a) Favorite movie type is either action or drama

$$P(A \cup C) = P(A) + P(E)$$

$$= 42 + 36$$

$$\boxed{P(A \cup C) = 78}$$

b) Favorite movie type is either comedy or horror

$$P(B \cup D) = P(B) + P(D)$$

$$= 54 + 12$$

$$\boxed{P(B \cup D) = 66}$$

b) Given

Average = 350870

Standard Deviation = 12405

$$75^{th} \text{ Percentile}(z) = \frac{X - \mu}{\sigma}$$

$$0.675 = \frac{X - 350870}{12405}$$

$$X = (0.675 \times 12405) + 350870$$

$$X = 8373.375 + 350870$$

$$X = 359243.04$$

$$\boxed{75^{th} \text{ Percentile} = 359243.04}$$

3) Given:

Bag A → red ball - 3

black ball - 5

Bag B → white ball - 4

black ball - 7

$P(A) = 1/2$

$P\left(\frac{\text{Black ball}}{A}\right) = 5/8$

$P(B) = 1/2$

$P\left(\frac{\text{Black ball}}{B}\right) = 7/11$

$$P\left(\frac{B}{\text{Black Ball}}\right) = \frac{P(B) \times P\left(\frac{\text{Black Ball}}{B}\right)}{P(A) \times P\left(\frac{\text{Black Ball}}{A}\right) + P(B) \times P\left(\frac{\text{Black ball}}{B}\right)}$$

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

$$= 0.5045$$

4) Given

One hour = 450 Application

λ (mean) $= 450/60$

$\lambda = 15/2$

$x = 10$

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

$P(x = x) = 0.0858$