

1) Total Samples = 52

No. of diamond = 13

No. of heart = 13

No. of spade = 13

$P(1 \text{ is diamond, } 1 \text{ is heart, } 1 \text{ is spade})$

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

$$= 0.0165$$

2) Action = 42% = $\frac{42}{100}$

Comedy = 54% = $\frac{54}{100}$

Drama = 36% = $\frac{36}{100}$

Horror = 12% = $\frac{12}{100}$

$$(a) P(A) + P(D) = \frac{42}{100} + \frac{36}{100} = \frac{78}{100}$$

$$(b) P(C) + P(H) = \frac{54}{100} + \frac{12}{100} = \frac{66}{100}$$

3) Given:

A

B

A = 3

W = 4

B = 5

B = 7

Let Black be α

$$P\left(\frac{\alpha}{A}\right) = \frac{5}{8} \quad , \quad P\left(\frac{\alpha}{B}\right) = \frac{7}{11}$$

$P\left(\frac{\beta}{\alpha}\right)$ = Probability of Black (α) is from B

$$= \frac{P(B) \times P\left(\frac{\alpha}{B}\right)}{P(A) \times P\left(\frac{\alpha}{A}\right) + P(B) \times P\left(\frac{\alpha}{B}\right)}$$

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

$$= \frac{\frac{7}{22}}{\frac{5}{16} + \frac{7}{22}} = \frac{7}{16 + 7} = \frac{7}{23}$$

$$= \frac{0.318}{0.630}$$

$$= 0.505$$

6) $M = 350870$

$\sigma = 12405$

$z = 75 \Rightarrow 0.675$

Percentile = $350870 + (10 \cdot 0.675 + 12405)$

= $359,243.375$