Data Science

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1) $h(S) = {}^{52}C_3 = \frac{52 \times 51 \times 50}{3 \times 2 \times 1} = 88400$

$= {}^{13}C_1 \times {}^{13}C_1 \times {}^{13}C_1$

$= 13 \times 13 \times 13$

$= 2197$

$= \frac{h(E)}{h(S)} = \frac{2197}{88400} = \frac{169}{6800}$

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2) Action movies = 42-1 => P(A)

Comedy movies = 54-1 => P(B)

Drama movies = 36-1 => P(C)

Horror movies = 12-1 => P(D)

a) Either action or drama

$P(A \cup C) = P(A) + P(C) - P(A \cap C)$

$= 42 + 36 - 0$

$P(A \cup C) = \frac{78}{100}$

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

$= 0.631$

b) $z = \frac{x - \mu}{\sigma}$

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

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

$X = 359237.045$

75th percentile : 359237.045

b) Either comedy or horror

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

$$= 54 + 12 - 0$$

$$P(B \cup D) = \frac{66}{100}$$

3) $\frac{5C1}{12C1} + \frac{7C1}{11C1}$

$$= \frac{5}{12} + \frac{7}{11}$$

$$= \frac{5 \quad 5+84}{132} = \frac{1/2 \times 7/11}{1/2 \times 5/12 \times 1/2 \times 7/11}$$

$$= \frac{7/11}{5/12 + 7/11} = \frac{12}{139} \times \frac{7}{4}$$

$$= \frac{84}{139}$$

4)

Given: ASD applications in 1 hour

By poisson distribution

a) $\lambda = \frac{456}{60}$

$$\lambda = \frac{15}{2}$$

$$x = 10$$

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

$$= 0.0858$$