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DATA SCIENCE

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1) $n(3) = 52C_3 = \frac{52 \times 51 \times 50}{3 \times 2 \times 1} = 88,400$

$= 13C_1 \times 13C_1 \times 13C_1$

$= 13 \times 13 \times 13$

$= 2197$

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

$= 0.0165$

2)

Action Movies = 42% → P(A)

Comedy movies = 54% → P(B)

Drama movies = 36% → P(C)

Horror movies = 12% → P(D)

a) Either action or drama

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

$= 42 + 36 - 0$

$P(A \cup C) = 78/100$

b) Either comedy or horror

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

$= 54 + 12 - 0$

$P(B \cup D) = 66/100$

3) Bag A
Red - 3
Black - 5

Bag - B
White - 4
Black - 7

$P(A) = 1/2$, $P(B) = 1/2$.

$P(\text{Black}/A) = 5/8$, $P(\text{Black}/B) = 7/11$

$$P(B/\text{Black}) = \frac{P(B) \times P(\text{Black}/B)}{P(A) \times P(\text{Black}/A) + P(B) \times P(\text{Black}/B)}$$

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

$$= \frac{7/22}{5/16 + 7/22} = \frac{7/22}{\frac{110 + 112}{352}} = \frac{7/22}{222/352} = 7/22 \times \frac{352}{222}$$

$$= \frac{2464}{1884} = 0.5045$$

$P(B/\text{black}) = 0.5045$.

4) Given:

450 Applications in 1 hour.

By poisson distribution.

a) $\lambda = \frac{450}{60}$

$\lambda = 15/2$, $x = 10$.

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

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

$= 0.6321$

6)

$$z = \frac{x - M}{\sigma}$$

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

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

$= 359237.045$

$= 359237.045$