Machine Learning Assignment 44

Your Name

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Solution

(a[a]) 6 favored outcomes (for 6 different X_1 values) and 36 possible outcomes. We then have a probability of $\frac{1}{6}$.

(a[b]) 6 favored outcomes and 36 total outcomes. The final probability is then $\frac{1}{6}$

(a[c]) 15 favored outcomes and 36 total outcomes. The final probability is then $\frac{5}{12}$

(b[a]) Let x be $P(A \cap B)$

$$0.9 = 0.4 - x + 0.7 - x + x$$
$$x = 0.2$$

(b[b]) This is everything in B that isn't in A, which is $0.9 - 0.4 = 0.5$

(b[c]) This is everything in A that isn't in B, which is $0.9 - 0.7 = 0.2$

(b[d]) This is everything outside A and B, which would be $1 - 0.9 = 0.1$

(b[e]) This is everything outside of A with the exception of the intersection, which would be $0.7 + 0.1 = 0.8$

(b[f]) This is the intersection of A with everything that isn't in A with the exception of the intersection, so the intersection 0.2 if the probability

(c)

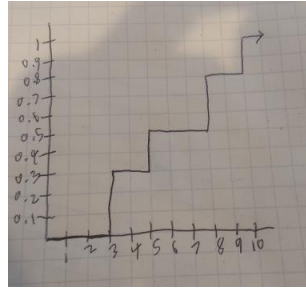$$\text{probability of getting } k \text{ red balls} = \binom{20}{k} \cdot \left(\frac{3}{10}\right)^k \cdot \left(\frac{7}{10}\right)^{20-k}$$

(d)

Figure 1: Cumulative Distribution Graph