Tutorial 6

(SC222)

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1. Suppose that the number of typographical errors on a single page of this book has a Poisson distribution with parameter $\lambda = 1/2$. Calculate the probability that there is at least one error on this page.

2. If independent trials, each resulting in a success with probability p, are performed, what is the probability of r successes occurring before m failures?

3. A purchaser of electrical components buys them in lots of size 10. It is his policy to inspect 3 components randomly from a lot and to accept the lot only if all 3 are non-defective. If 30 percent of the lots have 4 defective components and 70 percent have only 1, what proportion of lots does the purchaser reject?

4. Find the expected value of the sum obtained when n fair dice are rolled.

5. The distribution function of the random variable X is given by

$$F(X) = \begin{cases} 0 & x < 0 \\ x/2 & 0 \leq x < 1 \\ 2/3 & 1 \leq x < 2 \\ 11/12 & 2 \leq x < 3 \\ 1 & 3 \leq x. \end{cases}$$

   Compute (a) $P\{X < 3\}$, (b) $P\{X = 1\}$, and (c) $P\{2 < X \leq 4\}$.