CX2100 Prob & Stat

Tutorial #3

Discrete Probability Distribution

1. Suppose that the probabilities are 0.2, 0.4, 0.3 and 0.1 that the number of wills filed on any day at Kusu Island will be 0, 1, 2, or 3.

   (a) What is the probability of having at least 2 wills filed per day?
   (b) Find the expected number of wills filed per day.
   (c) Find the variance of the number of wills filed per day.

2. Given that $f(x) = k/2^x$, is a discrete probability function for a r.v. that can take on the values $x = 0, 1, 2, 3$ and 4. Find k and tabulate the cumulative probability $P(X \leq x)$.

3. A biased die is rolled 50 times and the number of twos appeared is 10. If the die is rolled for another 10 times, determine the following:

   (a) the probability that we get a two exactly 3 times.
   (b) the expected number of twos.
   (c) the variance of the number of twos.

4. The number of calls coming per minute into a hotel reservation center is Poisson random variable with mean 3.

   (a) Find the probability that no calls come in a given 1minute period.
   (b) Assume that the number of calls arriving in two different minutes are independent. Find the probability that at least two calls will arrive in a given two minutes period.

5. The probability that a student fails Subject A exam is 0.05. If the student failed the subject, he will have to re-take it the following semester. Let X be the number of times he attempted to pass the subject.

   (a) Determine and name the probability distribution of X.
   (b) Find the probability that a student will pass the subject with no more than 2 attempts.
   (c) Find the average number of attempts to pass the subject.

Answers

1. (a) 0.4 (b) 1.3 (c) 0.81

2. 16/31

x	0	1	2	3	4
$F(x) = \text{Prob}(X \leq x)$	16/31	24/31	28/31	30/31	1

3. (a) 0.20133 (b) 2 (c) 1.6

4. (a) e^{-3} (b) $1 - 7e^{-6}$

5. (a) $P(X=k) = 0.05^{k-1}\, 0.95$ (Geometric dist) (b) 0.9975 (c) 1.0526