Identification of Discreate Probability Distribution(Questions)

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Question 1

Among 10 laptop computers, five are good and five have defects. Unaware to this, a customer buys 6 laptops. What is the probability of exactly 2 defective laptops among them?

Hyper-geometric distribution; N=10; n=6; k=5

>> P(X=2)

Question 2

At busy time a telephone exchange is very near capacity, so caller has difficulty placing their calls. It may be on interest to know the number of attempts necessary in order to gain a connection during busy time. Suppose that we let p=0.05 be the probability of connecting during a busy time. We are interested in knowing the probability that 6 attempts are necessary for a successful call.

Geometric distribution; p=0.05

>> P(X=6) = p*q^5

Question 3

Suppose that a machine shop orders 500 bolts from a supplier. To determine whether to accept the shipment of bolts, the manager of the facility randomly selects 12 bolts. If none of the 12 randomly selected bolts is found to be defective, he concludes that the shipment is acceptable.

- If 10% of the bolts in the population are defective, what is the probability that none of the selected bolts are defective?
- If 20% of the bolts in the population are defective, what is the probability that none of the selected bolts are defective?

Hyper-geometric distribution; N=500; n=12;
k = 50 for part a, k = 100 for part b

Question 4

In a certain industrial facility, accidents occur infrequently. It is known that the probability of an accident on any given day is 0.005 and accidents are independent of each other. Consider a year time period (365 days).

a. What is the probability that exactly one accident occurs in a year?

b. What is the probability that at least one accident occurs in a year?

Poisson distribution; p=0.005; n=365; mean mu=np

>> P(X=1) for part a
>> P(X>=1) = 1 - P(X=0)

Question 5

Bits are sent over a communications channel in packets of 12. If the probability of a bit is being corrupted over this channel is 0.1 and such errors are independent, What is the probability that no more than 2 bits in a packet are corrupted?

Binomial distribution; n=12; p=0.1

>> P(X<=2)