**SDS 321 Worksheet 7 (Discrete Random Variables )**

1. Ten percent of computer parts produced by a certain supplier are defective. What is the probability that a sample of 10 parts contains

   a) No defective ones?
   b) Exactly 3 defective ones
   c) More than 3 defective ones?

2. Products produced by a machine have a 3% defective rate. During quality control, items are drawn at random to check whether they are defective. What is the probability that the first defective is found in the fifth item inspected?

3. A network was attacked by a computer virus. This virus enters each computer with probability 0.4, independently of other computers.

   a) A computer manager checks the computers one after another, to see if they were infected by the virus. What is the probability that she has to test 6 computers to find the first infected one?
   b) Suppose the manager checked 6 computers and none of them has the virus. What is the probability that she has to check a total of 10 computers to find the first infected one?
   c) Suppose the manager checked 6 computers and none of them has the virus. What is the probability that she has to check more than 10 computers to find the first infected one?
   d) Suppose the manager checked 6 computers and none of them has the virus. What is the probability that she has to check at least 10 computers to find the first infected one?
   e) Suppose a particular lab contains 20 computers. Find the probability that the virus enters no more than 18 computers.

4. On average, 1 computer in 800 crashes during a severe thunderstorm. A certain company had 4,000 working computers when the area was hit by a severe thunderstorm. Compute the probability that exactly 10 computers crashed using (a) a binomial distribution and (b) a Poisson distribution. How do your answers compare?