**Question 13.1**

For each of the following distributions, give an example of data that you would expect to follow this distribution (besides the examples already discussed in class).

# Binomial

# Geometric

# Poisson

# Exponential

# Weibull

a. Binomial：

Binomial distribution models the number of successes in n trials, when the trials are independent with common success probability, p. An example would be in quality management. Assuming we produce a specific part, the defect rate is p. If we product n of this part, the number of defective parts should be expected to follow Binomial distribution.

b. Geometric

Geometric distribution models the probability distribution of the number X of Bernoulli trials needed to get one success. So we can have almost the same example: the number of parts we did quality check before we detect the first defective parts. The defect rate of each part is p, and we product n of this part.

c. Poisson

Poisson distribution models the number of independent events that occur in a fixed amount of time or space. I also have an example in quality management. The number of defects found in 30 cubic meters of sheet metal would follow the poisson distribution.

d. Exponential

Exponential distribution models the time between independent events, or a process time which is memoryless. So I expect the time to failure for a system that has constant failure rate over time should follow an exponential distribution.

e. Weibull

Weibull distribution models the time to failure for components; can model increasing or decreasing failure rate hazard. So I would say the time before a disk drive fail. Because the failure rate of a disk drive increases over time, K>1.