1. Raindrops are falling at an average rate of 20 drops per square inch per minute. What would be a reasonable distribution to use for the number of raindrops hitting a particular region measuring 5 inches2 in t minutes? Why? Using your chosen distribution, compute the probability that the region has no rain drops in a given 3 second time interval. A reasonable choice of distribution is P

**Ans:** For above problem, we will use Poisson distribution, because we have to find how may times no event to take place.

Firstly we have to find in t minutes how much rainfall fall, so it will be t\* no of drops \*inches = t\*20\*5=100t.

So, as per Poisson distribution formulae, it will be

P(X=0)=((100/20)^0/0!)\*e^-100/20=e^-5=0.0067

1. Let X be a random day of the week, coded so that Monday is 1, Tuesday is 2, etc. (so X takes values 1, 2,..., 7, with equal probabilities). Let Y be the next day after X (again represented as an integer between 1 and 7). Do X and Y have the same distribution? What is P(X)

**Ans:** Yes, both will have same distribution and P(X) and P(Y) both will remain same as 1/7.